POLITICAL UNCERTAINTY, MARKET STRUCTURE AND THE FORMS OF STATE CAPTURE

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ABSTRACT. This paper studies when and why firms prefer more direct forms of state capture (i.e. without intermediaries, such as patronage or appointments to the bureaucracy) to more indirect ones (e.g. lobbying). Using a novel database on contractual arrangements between politicians, political brokers and businessmen in Benin, we find that an increase in political uncertainty is associated with an increase in direct forms of capture. We rationalize our findings through a principal-agent model under political uncertainty. Firms induce market distortions by making transfers to incumbents. Direct capture acts as an insurance for the firm, guaranteeing that its paid for distortions are kept in place even when the incumbent is displaced. We structurally estimate our model and show that policies thought to decrease state capture, such as improved bureaucrat selection, can have little to no effect once substitution towards indirect control is accounted for.

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1. Introduction

The influence of firms on politics is the subject of much discussion and scrutiny by both the public and the media. Interest in this subject has only increased with recently revealed cases that have shaken the economic performance and stability of many governments around the world. Salient examples include the billions received by the Gupta brothers under the Jacob Zuma government in South Africa and the influence of the large firms Odebrecht and JBS within the Brazilian government and development banks, with repercussions across South America and parts of Africa. Advanced democracies are not immune either, as the Siemens bribery scandal, the SNC Lavalin case in Canada, and ongoing investigations about the influence of U.S. conglomerates on regulation and policy show, amongst others.[1]

These issues have been intensely studied in academia, with a vast literature showing the existence of multiple forms of state capture and firm strategies to influence politicians, as well as how those strategies respond to incentives in different environments. While it is usually hard to observe the symbiotic relationship between firms and politicians, many papers have been able to show systematic evidence of their existence in a variety of different modes of capture. The evidence spans more direct mechanisms of capture, such as bureaucratic control (see Dal Bó, 2006 for a review of the regulatory case) and patronage (e.g. Burgess et al., 2015; Xu, 2018) to more indirect ones, including lobbying through advertisement and media (DellaVigna et al., 2016), career concerns and revolving doors (Mattozzi and Merlo, 2008; Blanes i Vidal et al., 2012; Fisman et al., 2014), charitable donations to organizations in one's district (Bertrand et al., 2019) and even a hidden chain of influence through secondary firms and charities that affects legislation (Bertrand et al., 2018).[2] By direct capture, we mean that the firm directly contracts with the agent de-facto in charge of policymaking. This could be a bureaucrat or office staff in charge of technical legislation, for instance. Meanwhile, indirect capture means the firms deal with a politician or another intermediary to the implementation of a desired policy. Firms benefit from these options through increases to profits, favorable loans and campaign financing (e.g. Hall and Wayman, 1990; Faccio, 2006; Khwaja and Mian, 2005; Acemoglu et al., 2016; Claessens et al., 2008, among others) and tax exemptions (Xu, 2018). While this important literature has focused on the existence and magnitude of these different mechanisms, it has left largely unexplained how businesses choose amongst the different forms of interactions, and how those choices respond to the political environment. For example, consider the case of a

[1] For further details, for example, see:
"State capture: how the Gupta brothers hijacked South Africa using bribes instead of bullets", Vanity Fair (March, 2019).
https://www.vanityfair.com/news/2019/03/how-the-gupta-brothers-hijacked-south-africa-corruption-bribes
"Brazil's Odebrecht corruption scandal explained", BBC (April 17, 2019).
https://www.bbc.com/news/business-39194395
"At Siemens, Bribery Was Just a Line Item", New York Times (December 20, 2008).
https://www.nytimes.com/2008/12/21/business/worldbusiness/21siemens.html
"What you need to know about the SNC-Lavalin affair", CBC (February 13, 2019).
https://www.cbc.ca/news/politics/trudeau-wilson-raybould-attorney-general-snc-lavalin-1.5014271
"The Corporate Capture of the United States", Harvard Law School Forum on Corporate Governance & Financial Regulation (January 5, 2012).
https://corpgov.law.harvard.edu/2012/01/05/the-corporate-capture-of-the-united-states/.

[2] The aforementioned empirical evidence stretches through many settings, including the U.S., U.K., Pakistan, Uganda, Italy, Brazil among others.

U.S. pharmaceutical firm that wants a drug approved. It can try to influence the FDA's members or committee decisions directly. Alternatively, it could resort to campaign lobbying to convince the incumbent to implement policy changes. Similarly, in a developing country, a local business owner could try to appoint bureaucrats who could design favorable policies (e.g. allowing him to have a monopoly over government services), or they could focus their efforts on convincing the legislator to enforce a policy instead. Why do firms sometimes prefer to capture the state in a more direct or indirect way? When is one type of strategy preferable and how does this depend on political competition? What are the welfare implications of these choices, and how can state capture be curbed? The present work fills this gap.

We collect a novel database on contractual arrangements between politicians and firms in Benin. The country provides us a setting of a democracy with a large degree of electoral competition and with a local bureaucratic system, both known to be subject to state capture.[3] As a result, it provides variation in both of these dimensions of interest in a context that is plausibly representative of other developing countries. It is also a setting where we can go to the field and collect the data necessary for our study. Political competition is our main focus because it is a first order mechanism driving these choices. After all, the firms' choices of the form of capture depend on how likely is it for a deal with a politician to be enforced: the investment made in a politician through campaign financing can be lost if he does not win. This is particularly prevalent in highly competitive elections. Second, as we show and discuss below, while the literature has stressed multiple benefits of political competition on welfare, once capture is factored in, it may yield undesirable results.

Using a variety of statistical methods to appropriately sample this data, including chain-referral (snowballing) techniques and a list experiment, we create a dataset of more than 300 Beninese politicians (Deputies, Ministries, Mayors, etc.) covering Benin's 12 departments, 20 of the 24 electoral districts (circumscriptions) and 52 of the country's 77 communes. One main innovation in this data is the availability of the types of relationships between businesses and politicians: whether they are direct (e.g. bureaucratic control, public procurement, patronage), or more indirect (support for future candidates, financial refunds). This variable is matched to politician and commune-level characteristics. We use this information to show that higher political uncertainty for mayors, such as those due to an increase in electoral competition, generates *more* direct capture and more control of the government by firms.

While a first specification is based on observed correlations controlling for many local factors, a second identification strategy explores variation introduced by a nationwide electoral reform in 2018 that collapsed the number of parties across the country from hundreds to only two. This reform, designed at the national level, affected electoral uncertainty differently across communes depending on their previous electoral environment. We use it to compare communes that had multiple parties competing for office and, suddenly, were affected by the reform (our treatment group, with higher electoral competition) to communes that already had a de-facto two-party system (our control). As in the first specification, we find that those communes that experience an increase in electoral uncertainty face an increase in firms' preference for direct forms of state capture. Our results are

[3] In the next section, we provide institutional background about Benin's political and bureaucratic system. We also discuss the influence of firms on government in this environment, as well as background on the electoral reform used in one identification approach.

robust to this second variation and a variety of controls and placebo tests. Finally, these results are also confirmed using an additional experimental design within our survey.

We rationalize these findings with a principal-agent model of a profit-maximizing firm and a politician running for election (e.g. an incumbent mayor). A firm wishes to capture the mayor, who is able to affect market distortions in exchange for payments/rents. These distortions increase the firm's profit, at the cost of decreasing consumer surplus and market efficiency. Examples of such distortions include regulations and taxes that primarily affect only a firm's competitors, which would increase the competitors' marginal costs, as in the wedges in Hsieh and Klenow (2009). This would increase profits to the connected firm and decrease entry in that market (see Sukhtankar, 2012 for empirical evidence of this channel). However, political uncertainty implies that payments made by the firm to the incumbent might be lost: the incumbent might be removed in an election before (s)he is able to implement the agreed upon market distortions. In this setting, more direct forms of state capture "complete the contract" between firms and the state, insuring the firm that distortions will be maintained even if the incumbent loses. Intuitively, a loss by its preferred legislator is less damaging if the firm has its own preferred bureaucrats working in government or if it controlled the implementation of policies directly, as their preferred policies might still be implemented anyway. As a result, direct control is more valuable when electoral uncertainty is higher, since the value of this insurance is higher. In fact, more direct control is chosen in equilibrium despite it being more costly to the firm.

We show that this intuition also holds in an extension of our baseline model that allows for endogenous reelection, when firms' choices can increase a legislator's reelection chances. Finally, we provide a microfoundation for the model whereby direct control can be interpreted as a firm directly incentivizing bureaucrats to implement their desired distortions themselves. For instance, a firm can capture a bureaucrat directly, or appoint one from among its former employees for that goal (i.e. using revolving doors). Those bureaucrats implement a firm's preferred distortions even if the incumbent is removed. As such, bureaucrat capture leads to lower competition among firms and, thus, a welfare decrease. While it is possible that in highly institutionalized settings some direct forms of capture could be labeled as illegal, our mechanism should still be present as we would be addressing the firms' portfolio choice among a portfolio of legal-illegal forms of capture.[4]

We structurally estimate our model with the goal of quantifying the trade-offs in the choices of the forms of state capture, as well as welfare effects of counterfactual policies. To do so, we explore the equilibrium structure of our model for identification. We find that, all else constant, younger politicians are more likely to be captured in direct forms by firms and implement market distortions. In the model, this is consistent with their preferences weighing consumers' welfare less than firms' profits. One interpretation for the result with younger politicians is the role of career concerns (e.g. Mattozzi and Merlo, 2008), since relationships with firms for future campaign financing and gains in political careers are more desirable for this subset of candidates. We find suggestive evidence of a similar result for more experienced candidates, consistent with firms having higher values of being connected with them. We also find evidence that direct forms of capture are more prominent in

[4]Under Beninese law, all forms of capture we study - direct and indirect - are legal. Some of them may become illegal beyond a specific cap or threshold (e.g. campaign donations, as we discuss in Appendix) but enforcement is almost inexistent.

communes with larger population and lower amounts of state capacity. Since higher population can be a proxy for market size, this suggests that larger markets are more attractive to firms, possibly due to larger profits. Meanwhile, lower state capacity would imply more rents for legislators and firms, possibly through lower judicial monitoring of local-firm contractual arrangements and their consequences on consumer surplus.

We then show that policies suggested to decrease state capture, including improved selection of competent bureaucrats and legislators, might not actually accomplish those goals. This is because we introduce another margin through which businesses can react: it is not just the amount of state capture, but "how" this control is implemented. When firms can switch the form of government capture, they can undo the effects of these policies, leaving the level of state capture close to intact even if the form of control has changed.

We draw a novel insight from these findings: democracies that have high levels of competition and high political turnover, traits often viewed as desirable and healthy for a democracy, might allow more direct and more harmful state capture by special interest groups. As long as businesses are able to influence political decision making and policy, our findings suggest the possibility of a democratic backslide of increasing state capture and instability provoked by this environment, with perverse consequences for trust in institutions and economic growth (Fisman and Svensson, 2007). This conclusion brings into question whether voter information is sufficient to restore full accountability (as those found in Ferraz and Finan, 2008, 2011; Fujiwara and Wantchekon, 2013, for example). While voters can hold legislators accountable through reelection in our setting, electoral turnover is insufficient to curb state capture.[5] Hence, being able to remove an incumbent through voting is insufficient as a mechanism for improving welfare when firms are able to switch among forms of government control. Our counterfactuals recommend policies that improve the selection of politicians instead, regardless of political competition. This suggests a role, for example, for grassroots movements that can select candidates, keep incumbents accountable and provide a countervailing force to firms' influences.

In addition to the aforementioned literature on the different types of (mutually beneficial) relationships between firms and politicians, our paper also contributes to the literature on crony capitalism and state capture (e.g. Bai et al., 2014), by focusing on firms' strategic responses to political uncertainty. Similarly, we also contribute to the research on clientelistic contracts involving politicians and brokers (see Larreguy et al., 2016, for example) by focusing more on the firms' active role in this arrangement. This paper is also related to Yu (2005) who shows that interest groups engage in both direct and indirect forms influencing policy. However, we differ in that competition between interest groups is not what drives the choice of influence, but rather political competition. Moreover, while lobbying is a direct means to influence policy for Yu (2005), we allow for other forms of policy influence that can involve actors in charge of policy, such as bureaucrats.

Our work is also related to those studying the effects of political uncertainty on economic outcomes, subject to renewed interest particularly in macroeconomics - see Baker et al. (2016); Gao et al. (2019); Hassan et al. (2019). This literature shows that political uncertainty has negative

[5]This is a finding shares in other settings, most notably in Shleifer and Vishny (1994); Campante et al. (2009) on corruption, albeit due to different channels. There is also more recent empirical evidence on this nonlinear effect in Africa, see Cooper (2019) and other suggestive evidence in Goel and Saunoris (2017).

effects on stock prices, yields and other macroeconomic outcomes. Our microfoundation provides a link between political uncertainty and firm profits through changing market structure in different sectors.

More fundamentally, our paper explores the effects of political considerations on the relationship between politicians and firms building on theoretical insights from Shleifer and Vishny (1994). Politicians in their model cater more to interest groups than the median voter because the public cannot solve their collective action problem. In our paper, we model a similar dynamic whereby politicians receive rents at the detriment of policies beneficial to consumers. We further borrow the idea that incomplete contracts are the governing structure that mediates the relationship between politicians and firms. However, we explore an alternative (albeit widespread) setting where firms may have greater leverage than local politicians (as compared to one in which politicians own firms and corruption helps solve contract incompleteness). Our mechanism of contract completeness differs from theirs: direct forms of capture act as insurance for firms facing electoral uncertainty. We also provide empirical evidence in support of this mechanism.

Our model explains the choice of forms of engagement between firms and politicians and, so, draws motivation and insights from Coate and Morris (1995). In their work, they focus on the mechanisms available to politicians: whether they choose between direct transfers to voters (e.g. cash transfers) or indirect transfers (e.g. through public projects) which may benefit the voter, but certainly benefit a special interest group. This channel is only incorporated in an "aggregate" form in our work. We emphasize the firms' role in choosing among different mechanisms, and how those equilibrium decisions are shaped by electoral uncertainty instead. We clarify further differences between these models in a later section. In a similar vein, part of our model resembles the decisionmaking in Gehlbach et al. (2010) where businessmen choose between lobbying or running for office.

In the next section, we provide a brief overview of the institutional background which guides our empirical methodology, followed by details of the data collection. Our reduced form results based on this data motivate the model which is presented and then structurally estimated.

2. Benin's Institutional Background: A Brief Review of History, Politics and the 2018 Electoral Reform

The Republic of Benin, previously the Kingdom of Dahomey, was colonized by France in 1894 and became independent in 1960. A political turmoil period following independence lasted until 1972, with Mathieu Kerekou's eighteen-year dictatorship. In 1990, Benin became the first African country to transition democratically from a dictatorship, a transition regarded as a model for Sub-Saharan Africa. A representative assembly of all political factions was convened by the military regime due to mass protests and French economic pressure. The result was the creation of a new constitution and a multiparty system with regular elections for local mayors and councils,[6] parliament (83 members directly elected under proportional representation with closed-lists in 24 multi-member

[6]There are 77 communes governed by a mayor. Communes are divided into local *arrondissements* led by a chief. Mayors, delegates and deputies are appointed by communal councils made of members elected by majority each which represents a local district. Similarly, chiefs are appointed by village councils. Citizens can vote freely for different parties

constituencies or districts, two for each of the country's 12 departments)[7] and the presidency (a simple majority with runoff elections if no candidate reaches majority in the first round), from 1990 onwards. Voting is not compulsory.

Regarding Benin's local bureaucratic system, the mayor is in charge of appointing a Secretary General (SG) to act as the leading civil servant of the local administration. The Secretary General's role is to oversee the work of the whole local administration. The mayor can also appoint his/her local cabinet, and promote/fire local civil servants at discretion. However, "Loi N 97-028" imposes a constraint for the appointment and removal of bureaucrats in key local offices, including the local Planning and Development office, the Infrastructure and Maintenance office and the Public Procurement Office. As a result, civil servants in these offices hold longer tenures and have higher educational profiles that those where the mayor has discretionary power of appointment and removal (Kovo, 2019). Given their public nature and functions, these offices are of particular interest for local firms. This suggests the crucial tradeoff between using an intermediary (the mayor) or not (the bureaucrat) under higher political competition, which we address with our theoretical framework.

Benin has over 3,000 villages (rural) or *quartiers* (urban) in 77 communes, and they vary widely in the type of productive activities as well as in their political competition. Benin has been characterized by a high level of corporate capture of local and national politics, while experiencing what has been labeled as a successful democracy in the past decades.[8]

Starting with the new constitution in 1990, Benin's electoral system had over 200 parties in a country with a population of approximately 12 million, of which over 5 million were registered to vote.[9] The large majority of parties were weak and small, with coalitions and party alliances commonplace (Creevey et al., 2005; Gisselquist, 2008, 2014). This was partly a result of electoral rules, whereby a party or coalition could only participate in an electoral contest if it presented a candidate list in each district. Party switching became commonplace resulting in a highly fluid party system, centered around public figures rather than political programs.[10] Once elected to Parliament, groups formed larger blocs as a result of negotiation between leaders and the president. Since 1991, all national executives have secured majority in the legislature. However, in September 2018, the National Assembly (Benin's Unicameral Parliament) passed an electoral reform that increased the barriers to register political parties in national and local-level elections. Among many changes, the reform

for the communal and village-level councils. However, the norm is to 'vote the list' and choose the same political party. If a party wins by majority, they take all council positions; without majority, multi-party governments are formed.

[7]Party lists at the district level have the same number of candidates as seats to be filled. Seats are allocated to the different lists through a department level (simple) quotient. The remaining seats are allocated using the greatest remainder rule. For more detail on Benin's National Assembly, see the description of the Inter-Parliamentary Union at http://archive.ipu.org/parline-e/reports/2033_B.htm

[8]Benin has been pointed out as a case of thriving democratization mixed with weak governance and varying but low level of local state capacity. Figure 1 shows that the median winning margin for local elections is 10.7%. Competitiveness decreases for legislative elections.

[9]In 1991, 79 parties registered for elections; by 1998, there were 118 (Gisselquist, 2014) and by 2015 there were over 200registered parties.

[10]Parties/coalitions hold similar ideological platforms and are better identified by their ethnic and regional voter base. However, contrary to neighboring nations, ethnic polarization has not been as pronounced. Ethno-regional support rests on spatially focalized patronage incentives including promises for jobs, public services or financial transfers rather than promises for territorial autonomy or language-related policies (Gisselquist, 2014). To date, no major candidates have 'played the ethnic card' (Gisselquist, 2008). Moreover, the fragmented party system created incentives for coalition-building among ethnically diverse parties and constituencies. For more detail on the party system see Gisselquist (2014).

raised the monetary deposit required for the registration of candidates in lists from USD$15,000 (8.3 million CFA) to USD$440,000 (249 million CFA), decreased the amount of state resources to fund campaigns by 50% for local-level elections, introduced campaign caps and restricted former custom officers and forest agents to run for legislative seats unless they had resigned one year prior to the election (Duerksen, 2019).[11] The reform further established a 10% threshold for party lists to win representation in parliament, forcing small parties to form alliances.

The 2018 reform collapsed the number of parties to only 10. However, only 5 of those achieved registration status. After registration, the Constitutional Court disallowed 3 out of the 5 remaining parties to compete for seats at the National Assembly since they lacked a "certificate of conformity" issued by the Ministry of Interior albeit unstipulated in electoral laws. As a result, only two political options were available for the April 2019 elections: the Republican Bloc and the Progressive Union, two movements close to President Talon. After the elections, these two coalitions fully controlled the National Assembly with 56.2% (47 seats), and 43.8% of the vote (36 seats), respectively (Election Guide, Democracy Assistance and Elections News, 2019).

The reform's origins can be traced to a change in the Charter of Political Parties by the National Assembly in July 2018 that forced political parties to cover the national territory and expand the presence of ethnic and regional associations.[12] Parties had to recruit 15 founding members in each of the 1,155 communities nationwide. Legislators then passed the September 2018 electoral reform law. Supporters argued it was a necessary legislation to combat political party fragmentation, to promote larger political blocs and to promote legislative and local effectiveness. The restrictions it imposed led to the main opposition parties failing to gather the required documentation within the established deadline and, as a consequence, they did not participate in the April 28th, 2019 elections. Nevertheless, supporters still believed there was enough representation and competitiveness in those elections as the blocs corresponded to a large number of parties.[13]

3. Data

To test how political competition affects firms' preference for more direct forms of state capture, we collect data of international and domestic companies and electoral politics at national and local levels in Benin covering the 2015 and 2019 elections. We rely on a database on contractual arrangements between politicians, political brokers and firms in Benin. As noted by Wantchekon (2003), the

[11]Regarding campaign financing, candidates can request reimbursements for campaign expenses from the state. However, in practice this does not happen (Gisselquist, 2014) and party funding laws are constantly violated (Akpovo, 1997). As a result, a large proportion of campaign financing comes from corporations and is kept off the books (Bako-Arifari, 1995; Bierschenk, 2009). In Appendix A, we give further details about the institutional and symbiotic relationship between businesses, politicians and campaign financing. For further information, see the news articles "The Fall of a Model Democracy," The Atlantic, May 29, 2019, https://www.theatlantic.com/international/archive/2019/05/benin-west-africa-model-democracy-fall/590377/, and "How Benin's democratic crown has slipped", BBC, May 6, 2019, https://www.bbc.com/news/world-africa-48150006

[12]Présidence de la République,"Loi No. 2018-23 du 17 septembre 2018 portant charte des partis politiques en République du Bénin," 17 septembre 2018: https://sgg.gouv.bj/doc/loi-2018-23/.

[13]See President Patrice Talon in "Le moment politique," a Beninese television program (Youtube 2019).

country's institutional development has allowed for clientelistic promises to narrow groups of citizens and favored private use of local government resources.

To measure contractual choice, we carried out structured interviews of key players including campaign managers, local brokers and politicians and candidates, among others. These were conducted by the Institute of Empirical Research in Political Economy (IERPE) at the African School of Economics. A copy of the questionnaire that was administered is available on the authors' personal websites.[14] The result is a sample of more than 300 Beninese politicians (Deputies, Ministries, Mayors, etc.) as well as political brokers covering Benin's 12 departments, 20 of the 24 electoral districts, and 52 out of the country's 77 communes. For many of our main specifications, we will focus on the subset of mayors, as they have control over policy and direct relationships with firms. We will then compare their results to Deputies who face a different set of incentives as we outline below. Interviewing key agents and cross-validating these responses is most similar to the data collection conducted in Sanchez de la Sierra and Titeca (2019). They leverage trust relations within the hierarchy of a police battalion and ethnographic work to build a unique dataset on payments, transactions, tasks, and informal contacts between different levels of police forces and citizens.

Data collection took place in Beninese constituencies between February 6th and February 21st, 2019. Given the difficulty in identifying potential subjects to survey, a snowball sampling technique (or chain-referral sampling) was used, i.e. a non-probability sampling technique where existing politicians surveyed recruit future subjects from among their acquaintances. Prior to the interviews, the comptroller arranged an appointment with the politician via a phone call to establish the contact between the latter and his enumerators to prepare the interview. Then, enumerators met the politician either alone, or in a team of two or three, depending on the category (national or local) and/or the agenda of the latter to conduct the interviews.

Reconstructing contractual arrangements between politicians and firms based on recall presents multiple challenges. A salient one is the presence of measurement error due to imperfect recall. Another one is biased reporting due to sensitive information. To address such difficulties, firm owners, firm managers as well as political campaign managers were used to cross-validate the responses of politicians and brokers. Cross-validation from eyewitnesses in the presence of social desirability bias has proven to yield reliable information in past studies (see Sanchez de la Sierra, 2020, for instance, where survey responses are contrasted to on the ground specialists in order to detect and correct reporting biases). An additional concern is selection bias based on respondents' location. Appendix Table D-2 shows that this does not appear to be the case: we find no statistically significant differences in socio-economic or political characteristics between the 52 communes in our sample and the 25 not covered by our sampling technique.[15] Finally, to deal with possible selection in interviewees' response rates, we worked with party leaders who encouraged responses to the survey (they were also the first subjects of the chain-referral system).[16] Both the acceptance of the survey by party

[14] See, for example, sites.google.com/site/njcanen/research.

[15] Only population and voter turnout show a statistical difference between covered and missing communes in our database, although that is to be expected when comparing 19 covariates at reasonable significance levels. Nevertheless, we control for them in equations (4.1) and (4.2) so they do not drive our results.

[16] Top-down enforcement in highly centralized organizations has yield confident information in past studies (see Levitt and Venkatesh, 2000 on gang's finances, for example).

leaders and the content of the surveys (which did not ask about illegal activities) left politicians at ease.

A total of 311 political actors and brokers were surveyed and had cross-referenced responses: 256 politicians in total and 55 brokers (18% of the full sample). Among those, 68.5% (213) planned to run as candidates in the subsequent commune or legislative election. Within the latter subgroup, 55% (117 politicians) planned to run for mayor in the 2020 commune-level election, while the remainder (96) planned to compete in the 2019 legislative one. We use the former for our main estimates in the paper, and the latter for robustness checks.[17]

Summary statistics for the sample of mayors are shown in Table 1 while descriptive statistics for the full sample can be found in Appendix Table D-1. On average, surveyed individuals are 47 years old and the majority hold either an undergraduate or post-graduate degrees. Moreover, the vast majority of politicians are members of a political party (98%), but only 27% are first time candidates, and only 38% say they have held private positions in the past. Those who have run in multiple elections have often done so at multiple levels, from commune-level ones up to presidential-level elections. The summary statistics also confirm our description in Section 2 that Benin has a highly dynamic electoral environment, as over half of surveyed politicians have switched political parties. In our data, the main reason for these switches is their opposition to party platform change instead of opposition to their former political parties themselves. Only 7 out 213 politicians changed the municipality where they lived since 2015.

An important feature of the data is that we collect information about politicians-firm contracts, including their characteristics (such as funding amounts, funding sources and timelines). To check and possibly correct for social desirability bias (as some politicians might prefer not to answer truthfully), we conduct a list experiment on the survey question regarding politicians' affiliations with firms. The experiment compares two groups. A control group is asked to report the number of groups they are affiliated with, while the treatment group is asked the same groups plus an additional item of disclosing their affiliation to a firm. The difference in means represents the proportion of politicians that are connected to a firm. The results of this experiment are shown in Appendix Table B-1. We find that 83% of respondents running for mayor in 2020 are affiliated/connected to a corporation. This is similar in magnitude to those running for MP in 2019 in either treatment group in this list experiment.[18]

The key innovation in this dataset is the collection of variables that characterize different types of firm-politician contracts, including direct/indirect forms of capture. In this paper, we define direct capture as the absence of an intermediary between the firm and the actor that is in charge of de facto policymaking (which often is the bureaucrat in charge of implementing and writing up the legislation). As firms have enough information to know who is implementing that decision, they can opt between instructing implementers directly, or going indirectly to the politicians who then instruct the latter to implement campaign promises. This differential cost is captured in the model below. A representative example in Benin could be a local car dealer in a commune, who wishes to have the monopoly over the use of government services. He can donate/pay to a candidate to have the

[17] Our results are robust to using the subsample of politicians running for office, leaving political brokers aside.

[18] More details on the list experiment itself are presented in Appendix B. We address the question of why a firm might only donate to a single candidate in Section 7.1.

promise of favorable legislation, or bypass him directly to incentivize local policymakers. In the U.S. case, for instance, direct capture can mean a firm that directly targets employees at decision making agencies, such as the FCC or the FDA; or the office staff of the politician or the White House that writes up the legislation. Instead of these direct forms of capture, firms can opt to enroll politicians to work as intermediaries between firms and those in charge of policymaking.[19] As we show below, political uncertainty plays a key role: when uncertainty is high, it is too risky to rely on intermediaries that could be replaced, so the firm may switch to direct forms of capture, i.e. to bureaucrats.

In our data, contract types range from more indirect state capture demands including concessions on policy and procurement and political platforms during campaign periods, to more direct ones including direct appointments of firms' acquaintances to state offices, interventions through control of budget lines or the control of key bureaucratic positions. More specifically, we ask respondents in the questionnaire "what are the specific requirements of economic operators (from firms) in return of amount and resources transferred to your campaign or the one you worked for?" We asked them about 9 items: the promotion of specific policies; the targeting of public goods to specific markets/sectors; promoting the political career of friends or family members close to corporations; the appointment to bureaucratic positions of persons suggested by corporations; support for a future candidate nominated by the company; modification of the political program in accordance to local or national company interests; refund/reimbursement of funding granted during the electoral campaign; bureaucratic recruitment control, such as customs, judges, etc.; and whether they request a budget line at the national, commune or village level. These corporations' demands are used to create two outcomes to proxy for direct capture. For the first outcome, we classified each corporate demand to either an indirect or direct form of capture, following our definition above. We classified financial refunds, the promotion of specific policies and program changes, targeting public goods to specific markets, and support for a future candidate close to firms' interests as indirect forms of capture, as they all involve intermediaries in their implementation. All these demands take a value of 0. Meanwhile, contracts involving control of a budget line, patronage and bureaucratic recruitment control are classified as direct forms of capture take a value of 1. We average these indicator variables at the respondent-level and call this outcome the direct capture indicator throughout the paper.

A second outcome aggregates capture demands into a direct capture index, categorizing responses in the following way: financial refunds get a value of 0; promotion of specific policies and program changes a value of 1; targeting public goods to specific market/sector a value of 2; support for a future candidate close to firms' interests a value of 3; control of a budget line a value of 4; patronage 5; and, lastly, bureaucratic recruitment control a value of 6. We construct a direct capture index at the respondent-level that averages across categories since a respondent may have pointed to more than one requirement made by a firm. By construction, the index ranges from 0 to 6, with 6 the highest degree of direct capture.[20] We follow the same procedure to construct a direct capture index

[19] In practice, direct capture in local elections will be different than national elections. However, our definition is analogous to the above: while mayor/congress members are busy campaigning and gathering votes, they defer the write-up of policy legislation to other staff.

[20] Note that all of these types of contracts are legal under Beninese law. While some of them can be broken (e.g. donations above legal caps), it is hard to enforce any laws because these methods are legal and a ban could not be easily implemented through legislation or enforced through judicial courts. Even in the U.S., revolving doors and campaign

for respondents running for MP in 2019 averaging responses at the electoral district level. This index is based on a natural ordering of what constitutes a more direct form of capture of government: patronage, bureaucratic control are more direct interventions than support for policies or candidates in a campaign (without guarantee they will win), or targeting of public goods to a general sector. Nevertheless, due to the novelty of the data and questions addressed in this paper, there is an undeniable degree of subjectivity in this ranking even if it is based on previous literature and qualitative evidence. To get past this, we show that all our specifications in the next section are robust to collapsing this index into coarser "direct/indirect" groupings from the first outcome, as well as to switching the order of contiguously ranked items. Furthermore, as we discuss below, we conduct a large variety of cross-validation exercises for the dataset in as comprehensive and cohesive approach as we could. Summary statistics on the contractual relationships between firms and politicians are shown in Table 2.[21]

To study the effect of electoral uncertainty on the form of state capture and their effects on market structure, we use electoral data from previous elections. While our main reduced form results focus on the respondents' answer related to the 2019 campaign outcomes, we must use 2015 electoral to construct measures of electoral uncertainty since our data was collected prior to the final 2019 election results. The two measures we construct are winning margins and the number of political parties contending for office. Both constitute benchmark measures of electoral competition - one based on results, while the other is based on the supply of competitors. To measure the number of political parties by commune, we use the Laakso-Taagepera effective number of parties index.[22]

Meanwhile, we compute the winning margin by the difference in vote shares between the first placed and second placed party[23] in commune-level elections. We consider winning margin to be a proxy for electoral competition in a "bottom-up" electoral aggregation system where citizens vote on local councils by majority who then appoint mayors (see Section 2). In proportional representation systems as Benin, there is less incentive for strategic voting. Thus, we measure winning margins as the difference between the vote share of the leading party and the main opposition party runner at the commune level, despite the presence of other parties that may still win legislative seats. This is supported by our experience in the field when communicating with local voters, politicians and brokers, as this is precisely the winning margin that is interpreted by both voters and MPs as the main competitive difference. Furthermore, as noted by Fujiwara and Sanz (2019), albeit in a different context, being labeled as the most voted party represents a higher bargaining power to form government or sustain coalition majorities in legislative bodies.

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donations are not illegal, and regulatory capture can still happen through expertise (by the role of sectoral lobbying and information dissemination, for example, in pharmaceuticals or technology). Appendix B discusses our list experiment and how we deal with the issue of social desirability bias due to the sensitivity of exposing contractual arrangements with firms. However, we expect that underreporting would be stronger in more direct rather than indirect forms of capture. This implies that our results in the next section would be biased downwards.

[21] Our data also includes information about campaign finance, which we describe in more detail in Appendix A. The main takeaway from this part of the data is that there is a relatively large amount of money spent by firms in political deals in this context.

[22] Laakso and Taagepera (1979) computes the effective number of parties as one over the sum of the squared of each party's vote share, which is essentially the inverse of a Herfindhal-Hirschman Index for parties. All results are robust to the use of other effective number of parties indices, including the index of Molinar (1991).

[23] Benin has a one-candidate-one-party system.

4. Reduced Form (Motivating) Evidence

First, we analyze the relationship between winning margins and firms' state capture preferences as stated in contractual arrangements. In particular, we estimate the following Ordinary Least Squares (OLS) specification:[24]

$$y_{i,c} = \alpha + \gamma_D + \beta \text{Winning Margin}_c + \mathbf{X}_c'\Phi + \mathbf{W}_i'\Theta + \epsilon_{i,c} \tag{4.1}$$

where $y_{i,c}$ is the direct capture indicator (or index) in commune c from respondent i in 2019; Winning Margin$_c$ is a continuous variable on the winning margin in commune c in the 2015 elections; $\mathbf{X}_c$ is a vector of commune-level control variables including voter turnout and effective number of parties in 2015,[25] executed fiscal expenses in 2013 to proxy for local state revenues and capacity,[26] and population in 2015 (estimated using the Global Human Settlement 2015 raster file). $\mathbf{W}_i$ is a vector of politician-level characteristics listed in Table 1, including age, university education, a dummy to account for switching parties since last election, if the respondent is not part of the President's coalition, and whether (s)he is an incumbent.[27] We also include a department fixed-effect, γ_D (a geographical level above communes), to account for any department-level time-invariant heterogeneity. Thus, our estimates account for the change in firms' choices for direct forms of state capture in communes that experienced high electoral uncertainty as proxied by smaller winning margins. The variation compares such communes within departments, controlling for municipality level characteristics. Throughout our specifications, standard errors are clustered at the department level as that is the level of the fixed effect.

Table 3 shows the estimates from this first specification. Our main parameter of interest, β, captures the effect of electoral competition - measured by winning margins - on firms' preference for direct capture. Our results are in terms of "beta" coefficients, as we standardize the variables. Column (1) controls for commune-level covariates; column (2) adds department fixed effects, and column (3) includes additional politician-level characteristics. For instance, column (3) shows that a one standard deviation increase in the winning margin leads to a -0.454 standard deviation decrease in the forms of direct capture. This maps to a decrease of 32.6% in direct capture. The results appear

[24] Very preliminary results of a subset of the reduced form evidence in this section were reported in a policy brief by Ch et al. (2019).

[25] We control for the number of parties since electoral uncertainty as proxied by a small winning margin and large number of parties differs from one with a smaller number of parties. The second scenario increases the predictability of the results and, thus, political uncertainty in the commune.

[26] We also have data on nighttime luminosity to proxy for economic activity. Luminosity has been shown to be a good approximation of national and local economic activity, particularly in Africa (Henderson et al., 2011; Bleakley and Lin, 2012; Michalopoulos and Papaioannou, 2013; Storeygard, 2012; Weidmann and Schutte, 2016). However, we do not use it in our main specifications for two main reasons. Since fiscal expenses and luminosity are highly correlated, we must choose one or the other. While the results are robust to using luminosity, we do not believe they provide the best results. As Benin is generally a poor country, luminosity can only be detected in a very small fraction of daily pictures in the year. Correction techniques to account for this sparse measurement only consider stable lights or pixels that appear lit above certain threshold. Applying these techniques would lead to dropping 7 communes from our sample. While we could use non-corrected luminosity, this measure suffers from multiple problems including geographic misalignment, abnormal fluctuations across time, overglow across space and spatial correlation (see Ch et al. (2020) for more detail and correction procedures).

[27] The results are robust to including the characteristics listed in Table 1.

robust throughout the specifications. In the second panel, we present the same results using the direct capture index instead, showing very similar results.

In column (4) we carry out a placebo test using the winning margin between the second and third placed party as a proxy of electoral competition instead of the winning margin between the first and second placed party. We do not expect that changes in competition lower down the list represent increases in commune-level electoral uncertainty and, thus, they should not affect preferences for direct capture. As expected, we find null results for this effect.

Columns (5) and (6) show the results of a second placebo test. There, we test whether the same effects are present in legislative elections. Elections for MPs in Benin provide an ideal placebo as these legislators neither hold control over national or regional level procurement and budgeting, nor do they have say on national or regional bureaucratic positions. In fact, Article 79 of the constitution states that their only powers are over lawmaking and to control the action of the government. In contrast to other settings, MPs in Benin are not allocated to relevant committees in Parliament in charge of budgeting, but they rely on party and executive lines for general voting patterns in the Assembly instead (see Lassou et al., 2019, as well as the official protocol from Ministère des Finances, 2000). By comparison, Article 67 states that mayors manage the commune's tax revenues, they have control over acts of communal selling/buying, entering into leases and contracts related to municipal works, among others. Thus, electoral shocks that modify the electoral uncertainty faced by MPs should not lead to firms' choosing more direct forms of state capture such as appointing more cronies to key government positions. This is indeed what we find in Table 3. Winning margins hold a positive and non-significant effect for MPs.[28] Lastly, our results are even clearer in Panel B of Table 3, where we use the direct capture index instead of the indicator. This is because the latter allows for more variation in the outcomes. The implications are the same regardless of which functional form outcome we use.

We perform many additional robustness checks. For example, one concern with this first set of results is the role of campaign funding, which could vary across close and non-competitive elections. Appendix Table A-3 shows that our baseline results are robust to controlling for reported campaign funding. In a further statistical check, Table D-3 provides 95% confidence intervals using the wild bootstrap and 1000 replications to account for the small number of clusters (12 departments) in inference, following Cameron et al. (2008). We also conduct a sensitivity analysis on the direct capture index. We pool items in pairs and triads, as well as swap the ordering of contiguous items. These changes preserve the structure of having the easily defined more direct forms of capture as higher values than the indirect ones, but show that our results do not rely on the exact ordering of individual items - see Appendix Table D-6, Panel A. Last but not least, our results are not driven by outlier communes: our results remain quantitatively similar when carrying out a jackknife-type estimation that sequentially deletes a single commune from the sample each time and then estimate

[28] One could be concerned that by averaging forms of capture at the respondent level we could be ignoring an intensive margin that could explain higher estimated direct capture. Instead of averaging across the classified forms of capture by respondent, we have also considered an alternative measure that adds them. We consider this measure to be a proxy for the intensive margin of direct capture. The null results we find with this measure suggest that the intensive margin is not driving higher direct capture. The results are available upon request.

the average effect for the direct capture indicator. For space considerations, these results are available with the authors.

To cross-validate our direct capture measure and further check the effect of electoral uncertainty on firms' strategic decision making, we ran a simple survey experiment. We asked all 117 respondents planning to run for commune-level elections how firms' demands would "change next electoral campaign if the number of candidates increases?". Appendix Table D-4 reports the difference in means from a two-sided t-test between the firms' demands used under the *status quo* (control) and the potential demands if the number of candidates increase (treatment). The results show an increase in the proportion of direct forms of capture from 34 to 66% when using the respondent-level direct capture indicator. This is significant at the 1% level. Using the direct capture index yields similar results, with an increase in the index from 2.995 to 4.33 on a scale of 0 to 6, which is also statistically significant at the 1% level. This exercise validates the findings in Table 3 without requiring the computation of a proxy for electoral competition.

While intuitive, this first specification does not rule out time-varying explanations. It simply shows that increasing political uncertainty is associated with increasing direct capture, even after controlling for politician and local level characteristics. Hence, it does not allow for the possibility that previous state capture affects electoral competition, which affects current modes of state capture. To further probe these results, we use quasi-exogenous variation introduced by the Electoral Reform in Benin in 2018 as a second reduced-form identification strategy.

Among other features, the 2018 Electoral Reform described in Section 2 collapsed the existent multiparty system to a two-party block competition. The reform forced parties to merge into a block to compete, with no more than two blocks being able to contend for any political position in the country. For our identification strategy, we compare communes that in 2015 had multiple parties competing for office and suddenly faced a collapse in the number of parties, decreasing electoral competition (the treatment group), to those communes that where already under a *de facto* two-party system (our control).[29] These two groups are balanced in observable politician characteristics as shown in Table 4.

The effect of the electoral uncertainty induced by this reform on firms' strategies of government capture in 2019 can be explored by estimating the following equation for commune-level elections:

$$y_{i,c} = \alpha + \gamma_D + \beta \text{Treated Electoral Reform}_c + \mathbf{X}_c'\Phi + \mathbf{W}_i'\Theta + \epsilon_{i,c}, \tag{4.2}$$

where $Treated\ Electoral\ Reform$ takes the value of 1 if commune c had a number of effective parties larger than 2.5 as measured by Laakso-Taagepera effective number of parties index, 0 otherwise. For our main specification we control for the same politician and commune-level covariates used in Table 3, except for the effective number of parties.[30] In this set-up, our identification is based on cross-sectional data: it compares communes that had a 2 party system pre-reform (and were unaffected, at least in terms of numbers of candidates and perceived electoral competition),

[29] The Laakso-Taagepera effective number of parties index is negatively correlated with the winning margin ($\rho = -0.534$) in the commune-level 2015 elections. As such, it represents a proxy for electoral competition. Similar correlations are found using Molinar and Golosov indices.

[30] We include the winning margin in 2015 to assess the effect of a decrease in the number of parties solely, and to rule out local political system dynamics pre-2019.

to those that were affected by a change in electoral competition, controlling for municipality level differences. The former group serves as a valid comparison group as long as both groups would have had the same expected outcomes absent treatment and conditional on covariates. The comparison across groups is made within departments once we include department fixed effects. Our identifying restrictions explores the motivation for these reforms which was national and did not directly target specific communes. It also exploits that electoral uncertainty variation occurs due to a quasi-exogenous shock conditionally independent from future firms' capture demands.[31] Figure 2 shows evidence that these restrictions are valid. There does not appear to be any particular spatial correlation in treatment assignment or targeting of the reform to communes with specific winning margins.

Table 5 presents the estimates of equation (4.2). Columns (1) to (3) have the direct capture indicator as an outcome, while columns (4) to (6) use the direct capture index. The results are expressed in standardized beta coefficients. Our preferred specification in column (3) shows that the effect of a decrease in electoral uncertainty (i.e. a decrease in political competition) decreases direct firm capture by -0.261 standard deviations. When we use the direct capture index as an outcome, we find a similar result in terms of sign and magnitude with a decrease of -0.207 standard deviations. Using the index, one can interpret this effect as a change in the mix of the firms' chosen strategies. While the results are noisy due to the small number of observations, they are validated by the different specifications and a variety of robustness and falsification tests.

Appendix Table A-4 shows that the results are robust to controlling for self-reported campaign financing. Panel B of Appendix Table D-6 shows that the results from our quasi-natural specification are also robust to minor reordering in the construction of the direct capture index (including switching the order of contiguously defined responses). These changes preserve the natural order of what is considered direct and indirect forms of capture, and further validate our findings. Since the Electoral Reform is allocated at the commune and not at the legislative circumscription level, we cannot run a placebo test on legislative level as done in Table 3. Instead, we perform a placebo test that checks whether the results are being driven by other mechanisms that are not our treatment. We run 1000 simulations following equation (4.2) and the specification of column (3) of Table 5. In each simulation, we randomly assign each commune to "Treatment" or "Control" using a random Bernoulli draw, where the success rate is equal to the proportion of treated communes by the Electoral Reform (58.11%). In other words, we randomly assign treatment following the observed treatment incidence. We then re-estimate our parameter of interest in each placebo simulation using the full subsample of respondents of Table 5. Figure 3 shows the resulting distribution of the 1,000 estimated beta coefficients across simulations. The average estimated effect of our placebo test is very close to zero, and it is very statistically unlikely that our estimate from Table 5 column (3) (blue line) could have been drawn from such a distribution. We also checked that the results hold when constructing 95% confidence intervals using a wild bootstrap, and the results remain quantititatively similar.

[31] This set-up is different than a difference-in-differences design which would compare changes in outcomes due to changes in competition in treated and control communes. Unfortunately, we do not have reliable historical data on the outcomes prior to 2019, so we explore the variation valid in the absence of time-series data.

In Appendix B, we conduct one final analysis to validate our results. Using the budget experiment of Cruz (2018), Appendix Table B-3 explores the relationship of political uncertainty and alternative outcomes considered by the literature (including transfers from politicians to voters and public good provision). Although noisy due to sample size limitations, we find point estimates consistent with the predictions found in the literature.

To rationalize the observations discussed in Section 4, we present a model of state capture and political uncertainty, where a firm's decisions affect market structure.

5. Theoretical Framework

5.1. General Outline

We present a model that integrates three features that are observed, but understudied: (i) state capture, and the multiple ways it occurs (i.e. more and less complex/direct forms of state capture), (ii) state capture affects market structure (the distortions created through the relationship between firms and politicians affect market concentration, how much firms produce and consumer surplus); and (iii) the role of political uncertainty in affecting (i)-(ii).

The model captures the results discussed in the previous section: most notably that higher political uncertainty is associated with increasing state capture (government control) and increasing direct forms of control. It also provides additional results on what we do not observe, including rents from firms to politicians. Finally, the model provides a mechanism that can explain these results, and it can be structurally estimated for further quantification of policy exercises. In a later section, we use this exact model to study how standard policies to curb state capture affect welfare and the forms of government control by firms.

5.2. Environment

We consider a politician and, for simplicity, a single market of firms and consumers. A firm i interacts with the politician/government to try to distort the market through capture. Capture means that the firm offers a payment to the politician, $w \in \mathbb{R}_+$ in exchange for effort/distortions $\mu \in \mathbb{R}_+$ that are observable to the firm.[32] The benefit of these distortions is an increase in the firm's profits, $\pi_i(\mu)$, at the cost of a decrease to consumer surplus $S(\mu)$. This is a feature that is observed empirically, for instance in Sukhtankar (2012). As previously described, one can think of these distortions as being taxes and regulations that would increase costs on the connected firm's competitors.[33]

[32] As we will see, in equilibrium, the payment w will be an explicit function of these distortions. The crucial part for our set-up is that only one set of distortions μ^* is chosen. If we allow for each firm to have a choice over distortions, we would have to understand how individual preferences over market distortions are aggregated across firms, in a setting where those distortions have externalities. Adding these features would only make the model more complex, and obfuscate the main mechanisms we describe below. It follows that assuming that only one firm interacts with the government instead of an agreed upon coalition is for simplicity of exposition only, since we could consider a scenario in which firms agree on a decision rule among themselves for who picks μ. Meanwhile, in contrast to Hsieh and Klenow (2009) and Huneeus and Kim (2018), we do not study aggregate distortions - only distortions within a market.

[33] In Appendix C.5, we provide a microfoundation for profits and consumer surplus based on a model of Cournot competition among firms with heterogeneous marginal costs. The connected firm's distortions increases the marginal costs of its competitors. This is reminiscent of the wedges among firms in a market of Hsieh and Klenow (2009). In

We assume that a politician is risk-neutral and has preferences for both rents, w, and consumer surplus, $S(\mu)$. Their utility is given by $w + \gamma S(\mu)$, where γ represents the weight for consumers' welfare relative to his own rents.[34] The politician has an outside option given by $\bar{u}$. We assume that $S(\mu)$ is decreasing and $\pi_i(\mu)$ is increasing in μ, and $\pi(\mu) + \gamma S(\mu)$ is increasing, differentiable and concave in μ for all μ.

Electoral uncertainty is modeled as a discrete random variable. With probability $p > 1/2$, the politician is (re)elected and is able to enforce promised distortions μ in the second period, yielding profits $\pi_i(\mu)$ to firm i.[35] With probability $1-p$, the incumbent is removed and the firm might lose its payment to the politician, as we explain shortly below. This p can be interpreted as the probability the incumbent politician is replaced by one who has no connections to the firm, possibly resulting from strategic interaction outside of the model.

The final piece of this model is the existence of different forms of state capture: while μ represents the effort the incumbent can make for the firm, firms can also choose *how* this μ is implemented. Is it through a more direct or indirect form of control? Following Tadelis (2002), denote $\tau \in [0,1]$ as a variable that measures the amount of contract completeness between the firm and the politician or, equivalently, the amount of *direct* control.[36] We assume that more complex contracts (those with more indirect forms of capture, or equivalently, a higher $1-\tau$) are less likely to be maintained if the incumbent is displaced.[37] For instance, it is less likely for the agreed upon policies to persist if a major company contracts with a legislator using lobbying, as compared to when the state has hired its former employees as those who can write legislation. That is, τ measures how likely it is that a deal with the incumbent is upheld, when the politician is replaced. However, direct control (complete/simpler capture) is costly, with cost $h(\tau)$ strictly increasing and convex, satisfying Inada conditions. For example, direct capture can be chosen if it is valuable enough for the firm to directly bribe the bureaucrat, instead of dealing indirectly for the policy implementation.[38]

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this set-up, distortions affect market structures in two salient ways. First, state capture increases the market shares of the connected firm by making their competitors' production relatively more costly. Second, such distortions (e.g. tax regulation) can induce exit in the market - some firms might not have enough profit to sustain entry given their higher marginal costs. Altogether, these increase profits of i and distort consumer surplus. We show that under a parametrization of consumer demand, this model generates profit function, $\pi(\mu)$ and consumer surplus $S(\mu)$ that satisfy the regularity conditions we impose in the main model.

[34] The parameter γ benchmarks the politician's accountability to voters. Even though this parameter can be micro-founded, we follow the redistributive politics literature (e.g. Dixit and Londregan 1998) which focuses on the aggregate welfare for groups of consumers, with a parameter capturing distortion losses. This is also similar to the parameter in Grossman and Helpman (1994) which measures the weight policymakers give to consumer welfare. This approach keeps the model simple without affecting its main conclusions.

[35] p captures the incumbency effect. $p > 1/2$ is useful only for comparative statics, as the variance $p(1-p)$ decreases with p for $p > 1/2$. In this case, an increase in p can be interpreted as an increase in electoral certainty. This uncertainty is a driving force in the model, as it makes $w(\mu)$ depend on whether distortions are more/less likely to persist over elections.

[36] A unidimensional $\tau \in [0,1]$ is compatible with our index of the amount of direct control, which is how we measure this variable in the data. See the Data section for details.

[37] Note that $w(\mu)$ is always paid: even though the firm pays a politician, the political uncertainty implies the latter might not be present in the future to guarantee the distortions are in fact implemented. This is the source of contract incompleteness in our model.

[38] The choice τ can also be interpreted as a cost of implementation when an incumbent is removed. We develop this microfoundation in Section 5.3.1, by considering the existence of a class of bureaucrats.

In summary, if the incumbent is replaced, the firm can still keep distortions μ with probability τ. With probability $(1-\tau)$, an issue arises and the new government does not keep the previous distortion.

5.3. A Model of State Capture, Political Uncertainty and Market Structure

Firm i offers the incumbent political contributions w and direct control τ in exchange for distortions μ, i.e. it offers a contract (w, τ, μ). The firm maximizes expected profits subject to the participation constraint[39]:

$$\max_{w,\tau,\mu} \; p\underbrace{(\pi_i(\mu) - w(\mu))}_{reelected} + (1-p)(\tau \underbrace{(\pi_i(\mu) - w(\mu))}_{direct\ control/distortions\ kept} + (1-\tau)(\underbrace{\pi_i(0) - w(\mu)}_{inc.\ displaced,\ distortions\ lost})) - h(\tau)$$

$$s.t. \quad w(\mu) + \underbrace{(p + (1-p)\tau)\gamma S(\mu) + (1-p)(1-\tau)\gamma S(0)}_{Expected\ Surplus} \geq \bar{u}$$

It follows immediately that the optimal choice of w involves paying contributions that leaves the politician exactly with his reservation utility (i.e. the participation constraint must be binding, as effort is observable, and the objective function is decreasing in w). Hence, we can rewrite the firm's problem as:

$$\max_{\tau,\mu} \quad (p + (1-p)\tau)\pi_i(\mu) + (1-p)(1-\tau)\pi_i(0) - w(\mu) - h(\tau) \tag{5.1}$$

$$s.t. \quad w(\mu) = \bar{u} - (p + (1-p)\tau)\gamma S(\mu) - (1-p)(1-\tau)\gamma S(0), \tag{5.2}$$

or simply,

$$\max_{\tau,\mu} (p + (1-p)\tau)(\pi_i(\mu) + \gamma S(\mu)) + (1-p)(1-\tau)(\pi_i(0) + \gamma S(0)) - \bar{u} - h(\tau). \tag{5.3}$$

We can see that the firm has "de-facto" preferences given by $\pi_i(\mu) + \gamma S(\mu)$. While the firm does not care about consumer surplus directly, it matters to the firm through having to compensate the politician for increasing distortions.

The objective function is concave in μ and in τ from our assumptions on $S(\mu), \pi_i(\mu)$ and $h(\tau)$, so the first order conditions are sufficient to characterize the solution to this problem. The equilibrium values of μ^*, τ^* are given implicitly by the two first order conditions:

$$[\tau :] \quad (1-p)\left((\pi_i(\mu^*) - \pi_i(0)) + \gamma(S(\mu^*) - S(0))\right) = h'(\tau^*), \tag{5.4}$$

$$[\mu :] \quad \nabla_\mu \pi_i(\mu^*) = -\gamma \nabla_\mu S(\mu^*), \tag{5.5}$$

[39] We consider that in the absence of distortions, the firm is left with profits $\pi_i(0)$. One could assume instead that, in the absence of i's preferred market structure, it is its competitors' that gets realized implying a profit for i of $\pi_i(-\mu) < \pi_i(0)$ for some μ. While this can be accommodated, we consider the first structure for simplicity.

and w^* is determined by substituting these results in (5.2). As a result, $w^*(\mu^*, \tau^*, p)$ is a function of electoral uncertainty, equilibrium distortions and direct control.

From the first order conditions above, we first note that the amount of "contract completeness", or direct control, equates the marginal cost to its expected marginal benefit. The marginal benefit is the aggregate return from the distortion μ^*: it improves profits relative to not being distorted (the term $(\pi_i(\mu^*) - \pi_i(0))$. However, it harms consumer surplus. Because politicians care about consumer surplus, firms internalize that this effect must be compensated to the politician through $w(\mu^*, \cdot)$ in (5.2). Meanwhile, the choice of distortions μ^* also equates the marginal benefit (the change in profits to the firm), to the marginal cost as perceived by the politician (the loss in consumer surplus, weighted by his preference for surplus relative to profits). Further note that while we consider a single choice of μ^* in the market, individual firms might choose different τ_i given μ^*.

It is straightforward that there is a unique interior solution to this problem by the strict concavity of the objective function. Equations (5.4)-(5.5) also operationalize finding this (interior) solution. Equation (5.5) completely defines μ^* in an interior solution. Given μ^*, one immediately finds τ^* from (5.4). This structure also forms the basis for our empirical estimation and counterfactuals.

Recall that following Tadelis (2002), we define $(1 - \tau)$ as the *complexity* of the contract with the politician. Alternatively, we called it the amount of *indirect control*. We can see how this is affected by electoral uncertainty:

Lemma 5.1. *With higher electoral certainty, indirect control increases (i.e.* $d(1-\tau)/dp > 0$*).*

Proof. Taking derivatives of (5.4) by the Implicit Function Theorem yields:

$$-\left((\pi_i(\mu^*) - \pi_i(0)) + \gamma(S(\mu^*) - S(0))\right) dp = h''(\tau) d\tau$$

The term in brackets on the left hand side is positive in any interior solution (as it represents the aggregate benefits of distortions to the firm). It follows that $d\tau/dp < 0$, yielding the result. We use that (5.5) is not a function of p. □

Intuitively, direct control acts as an insurance mechanism for the firm: although it is costly, it increases the probability that the firm will benefit from its distortion μ, obtained through the deterministic contribution $w(\mu)$. This insurance is more valuable the higher the electoral uncertainty (lower p): insurance pays only if the incumbent is displaced. This Lemma rationalizes the main results in Tables 3 and 5. The increase in value that direct control brings still compensates the larger cost firms face directly (through $h(\cdot)$) and through compensating the politician, who receives higher payments, as we show below.

Lemma 5.2. *With higher electoral certainty, transfers between firms and politicians increase:* $dw(\mu^*)/dp > 0$ *when costs of direct control are sufficiently convex, or electoral competition sufficiently weak.*

Proof. In Appendix C.1. □

This result captures and provides an explanation to the correlation found in Table B-3. There, we found that a strengthening of trades/transfers between firms and politicians occurs with higher electoral certainty. The mechanism the model provides is that the politician suffers a utility loss

from a higher p through a decreased (expected) consumer surplus. As p increases, consumer surplus is more likely to be distorted by μ^*, since the incumbent is more likely to stay in power.[40] As the politician values consumer surplus, (s)he must be compensated through increased transfers. Considering our motivating example of the car dealer who seeks control over government services: when there is a lot of electoral certainty, his firm can choose to simply negotiate with the politician. This is less costly than incentivizing the bureaucrat. Nevertheless, the car dealer must compensate the politician enough for the same transaction.

However, this result is nuanced: it does not always hold without the stated restrictions, as the proof in Appendix C.1 shows. In general, there are two effects from increasing electoral certainty: the direct effect $\left(\frac{dw^*}{dp} > 0\right)$ we described above, and an indirect effect from the effects of electoral certainty on direct control $\left(\frac{\partial w^*}{\partial \tau}\frac{\partial \tau^*}{\partial p} < 0\right)$. While the direct effect goes in the stated direction, the indirect effect goes in the opposite direction. An increase in electoral certainty decreases the amount of direct control, which in turn, reduces the probability that the distortions will be in place if the incumbent loses. This reduces the need to compensate the politicians for the distortions. Our result holds as long as the indirect effect is dominated by the direct one which occurs, for instance, when direct control is sufficiently costly (a formal description of "sufficiently" is found in the proof in Appendix).

We conclude this section by analyzing how total control of government by the firm changes with electoral uncertainty. For this, we must provide a formal definition of government control by the firm. In the model, governments are captured through two distinct mechanisms - through the form of control (direct/indirect, τ) and through the amount of effort they can induce the politician to do (μ). We note that $w(\cdot)$ is not a form of control, as it is an equilibrium compensation to guarantee effort μ.

Definition 5.1. We define the amount of government control by firm i as a function $k = g(\tau, \mu)$, where $g(\cdot)$ is increasing in both arguments.

Lemma 5.3. *Government control increases with electoral uncertainty.*

Proof. Immediate from taking the derivative of $k(\cdot)$ in p, and using the previous lemmas (i.e. $dk/dp = g_\tau(\tau, \mu)d\tau/dp + 0 < 0$). □

One example would be the linear case: control is the amount of effort from the government for the firm $\tau\mu + (1-\tau)0 = \tau\mu$. Again, this is clearly decreasing in p, which represents that as electoral certainty increases, it is less useful to have direct control, as the same optimum amount of distortion μ^* will be implemented without it.

As a result, this model suggests an active role for firms in "handcuffing" politicians. While a legislator could demand further compensation for approving policies that decrease consumer welfare,

[40] This result would have the opposite sign if the political distortions were welfare improving. For example, in a model in which distortions lower the marginal cost of production (e.g. companies are able to lobby to remove legislation improving their efficiency), consumers would benefit from distortions by an increased supply by more efficient firms. In a more consistent approach with our empirical context, we model these distortions as generating consumer losses, with firms lobbying to restrict the entry and production by opponents. A related work with this flavor is Akcigit et al. (2018). Our mechanism, context and additional empirical implications differ.

their ability to extract such rents from firms is limited by the latter's ability to switch to other forms of capture (e.g. there is margin by which they can bribe the bureaucrat directly, or just prefer to lobby). The firm in our model is an active decider trying to influence market structure through strategic influence. This contrasts to alternative assumptions where the politician extracts rents from the firm, while the firm tries to produce efficiently.

5.3.1. **A simple microfoundation for τ based on bureaucrat effort.** In our model, τ captures direct control of government (or contract completeness) in a reduced form way. In Appendix C.2, we provide a simple microfoundation for it based on firms having to incentivize bureaucrats directly. When the incumbent is reelected, we assume that (s)he is able to implement the firm's distortions μ^* effortlessly/costlessly (apart from the previous payment from the firm, $w(\mu, \tau, p)$). However, when the incumbent is removed, which occurs with probability $1 - p$, the firm can only implement distortions by incentivizing bureaucrats *directly*.

To do so, we consider a subgame where there is a new agent: (the representative) bureaucrat. This bureaucrat is risk averse, with utility $u(w, \theta)$, with $u(\cdot)$ strictly increasing and strictly concave in w and decreasing in θ - a parameter that denotes the amount of "cronyism". A larger θ means bureaucrats are willing to take less money for the same amount of distortion/effort implemented, akin to the "partisan" bureaucrat of Forand et al. (2020). This parameter can be interpreted as measuring the degree of a bureaucrat's dependence of the firm, and the amount of the bureaucrat's independence from the politician.[41] Hence, a higher θ maps to more crony bureaucrats. Such bureaucrats can represent agents who are ideologically more aligned to the firm or even its former employees (Blanes i Vidal et al., 2012) and, hence, more willing, trusted or able to partake in its distortions.

We show that this model generates the same specification as in the baseline model, except that τ is now the firm's equilibrium (incentivized) choice of bureaucrat effort, when the incumbent is not elected. Meanwhile, $h(\tau, \theta)$ represents the cost of payments to the bureaucrat for effort τ, and it is such that the cost is lower if the bureaucrat is a crony (i.e. $\frac{\partial h(\tau,\theta)}{\partial \theta} < 0$). More direct control (higher τ) means the firm induces higher effort by the bureaucrats to implement its desired distortions. This is more costly, because inducing higher effort by the bureaucrats requires larger payments. The reward to the firm for such effort is the higher probability of keeping the distortions in place. This explanation is consistent with firms choosing to influence policies through bureaucrat selection - they prefer a bureaucrat to be someone they know, not one who is independent. This can be done by bureaucrats being appointed by the firm, something present in our dataset, see Table 2 for example. We revisit the case of bureaucrat selection in a later section.

5.3.2. **The Case with Endogenous Reelection.** In our benchmark model, electoral uncertainty p was exogenous: a firm could not affect the probability of (re)election of its favored candidate.

[41] While we do not design a more complex game of simultaneous strategic interactions among politicians and bureaucrats, θ still allows them to be strategically dependent. For example, the relationship between a bureaucrat and politician may be conflictual. The politician may opt to fire unaligned (i.e. non-crony) bureaucrats, or only keep those they prefer. Bureaucrats may then provide kickbacks from their rents. This is a well-known phenomenon in patronage bureaucracies, see Khan (1996); Khan et al. (2000) for evidence from East and South Asia in the 1990s.

However, it is possible that large firms can influence electoral outcomes through campaign spending/donations, spending in addition to their contributions ($w(\mu)$) to induce market distortions.[42] In Section C.3 in Appendix, we extend our baseline model to allow for the possibility that p is a function of equilibrium distortions μ. One example of this set-up would be if p is affected by campaign donations, themselves a function of μ. We find that endogenizing p maintains the main qualitative results from the benchmark model, while adding nuance to some of the mechanisms.

There, we assume that $p(\mu)$ is increasing and differentiable in μ. We also assume regularity conditions, and discuss the underlying assumptions in detail in Appendix C.3. Then, we are able to prove that market distortions are higher than in the baseline case.

Lemma 5.4. *Let μ^*_{exo} be the equilibrium amount of market distortions in the game with an exogenous p (Section 5.3), and μ^*_{end} the equilibrium amount of distortions in the game with an endogenous $p(\mu)$. Then, $\mu^*_{exo} \leq \mu^*_{end}$.*

Proof. In Appendix C.3. □

From Lemma 5.4 we see that the total amount of market distortions increases when firms may affect political uncertainty through capture. Compared to the original problem, the endogenous p case provides an additional channel through which the firm benefits from distortions. Apart from increasing the firm's profits if implemented, market distortions also increase the probability in which this outcome of higher profits occurs. This additional mechanism yields a higher expected profit for the firm for the same values of μ relative to the exogenous election case.[43] This means that when firms can also impact a politician's election chances, they are able to extract further concessions that harm consumer surplus, despite the fact that they would have to pay more in transfers to those they help elect. An empirical implication of this result is that we should expect higher market concentration, market shares and profits for politically connected firms in races that firms can more easily influence.

Let us now consider the effects that endogenous electoral competition has on the forms of state capture. Recall that in the exogenous p case, μ and τ are strategic complements, an observation derived from equation (5.4). Intuitively, higher market distortions imply a higher "insurance" value of direct control. However, this is no longer necessarily true in the endogenous model. As electoral certainty now increases with μ, the insurance "value" of direct control decreases with μ. It is now increasingly likely that such distortions will be implemented, so the usefulness of insurance decreases. If this effect dominates, then $\tau^*_{end} < \tau^*_{exo}$. Then, there is a weakening of direct capture despite firms being able to influence electoral outcomes. On the other hand, if this effect is small, the same strategic complementarity effect from the exogenous case dominates, implying $\tau^*_{end} \geq \tau^*_{exo}$. By Lemma 5.4, there are more market distortions in the endogenous p equilibrium, and so there is a higher value for

[42] The use of money in politics and its effectiveness has been subject to a large literature particularly in the U.S., see Stratmann (2018) for a partial review. In our context, the data in Appendix A suggests there could be some role for firms to affect distortions and political selection due to the amount spent in campaigns. The existence of an effect through political selection would be consistent with other evidence in the developing world (e.g. Avis et al. 2019).

[43] While the payments $w(\mu)$ to the politician may also increase with μ, there is a higher loss of consumer surplus which must be compensated, as well as a higher probability that event takes place. Those effects are smaller than the additional benefits to the firm.

having direct control.[44] In this case, the mix of direct/indirect control sways politicians incentives' towards working more of the bureaucrats to implement their preferred distortions.

6. Discussion of the Model

Before exploring the predictions of the model in the data through a structural analysis, we comment on some of its main assumptions.

For the baseline model of Section 5.3, we assume observable effort. The model already has uncertainty through electoral prospects - the firm might not get what they paid for because the incumbent could be displaced. Effort being unobservable would be an additional source of uncertainty, which does not appear first-order. In particular, firms are better able to observe much of the politician's actions in the legislative process than guarantee his/her reelection. Making effort unobservable would also make the model intractable: realized distortions, a function of unobservables, would show up in *both* the contract $w(\mu)$ and the consumer surplus $S(\mu)$. This means that consumer surplus would be a highly non-linear function of a random variable unless strong parametric conditions are used. This is not as much of an issue with standard moral hazard models, where uncertainty is present in the payoff $w(\mu)$, but not in the costs of effort (analogous to our consumer surplus) as the latter is not a function of the output. As a result, a parametrization to obtain linearity à la Holmstrom and Milgrom (1991) is infeasible.[45] Similarly, we model bureaucrat effort as being observable in the microfoundation of τ. Otherwise, we would not generally be able to characterize the optimal payments w_b, and they no longer would be convex or a valid microfoundation of τ.

For modeling the effects of state capture on market structure in Appendix C.5, we map the firm's obtained distortions as an increase in the marginal costs of its competitors. This is similar to the wedges in marginal costs in Hsieh and Klenow (2009). While there are alternative ways to model distortions, they do not appear to be as appropriate. For example, distortions could multiply profits for connected firms (e.g. $\tilde{\pi}_i(\mu) = (1+\delta(\mu))\pi_i$). Unfortunately, the exact form this would take is unclear. Alternatively, distortions could affect only the connected firm's marginal costs c_i. It seems natural that in this case, beneficial distortions such as better tax regulation would decrease that firm's marginal cost. However, this generates the counterintuitive implication that consumer welfare would increase with state capture. Finally, an effect on fixed costs is analytically difficult because of its discrete effects on market entry.

There are a few notable differences between our model and that of Coate and Morris (1995), even though we are both inspired to understand the choice of contract relations between firms and politicians. These differences are driven by our interests in a different set of questions. First, in our

[44] To see this, consider the first order condition of (C.10) in τ: $(1-p(\mu^*_{end}))(\pi_i(\mu^*_{end})+\gamma S(\mu^*_{end})-(\pi_i(0)+\gamma S(0)))=h'(\tau^*_{end})$. Whether $\tau^*_{end} \geq \tau^*_{exo}$ depends on whether $h'(\tau^*_{end}) \geq h'(\tau^*_{exo})$ as $h(\cdot)$ is strictly convex. While it is true that $1-p(\mu_{end}) < 1-p_{exo}$, we also have that $\pi_i(\mu^*_{exo})+\gamma S(\mu^*_{exo})-(\pi_i(0)+\gamma S(0)) < \pi_i(\mu^*_{end})+\gamma S(\mu^*_{exo})-(\pi_i(0)+\gamma S(0))$ by Lemma 5.4. Absent further information or parametrizations, in general we cannot pin down which effect dominates.

[45] One alternative to deal with such non-linearities would be to focus on linear contracts in moral hazard games as in Carroll (2015). However, in this environment, we would have to specify *both* the set of actions that firms know as available to the politicians, and the ones politicians know themselves. How could the econometrician know better than the firm in this situation? Furthermore, why should we think of firms as "minimax" in profits when relating to politicians? In fact, the story our model conveys is not about politicians being opportunistic due to hidden information, but simply that even if they were willing to payback firms, they might be unable to do so.

model, firms are the leading agent in choosing how to interact with the government in our model and they have many possible mechanisms for state capture. Meanwhile in Coate and Morris (1995), the focus is on the politician as the key player, whose actions engage firms for donations, but are meant to influence imperfectly informed voters. Second, we emphasize the role of these different forms of capture on profits through effects on market structure. Third, we are interested in the role of electoral uncertainty in shaping these optimal contracts, and finally, we study the empirical and counterfactual implications of these choices on welfare. On the other hand, we do not study the role of asymmetric information by voters - our model works through a form of "incomplete contracts" between firms and politicians instead, which is closer to Shleifer and Vishny (1994). We do not explicitly model a voter's choice to reelect an incumbent either, capturing this effect through an aggregate parametrization.

Last but not least, our market structure in Appendix C.5 is a Cournot competition with homogeneous goods. The homogeneous goods assumption is validated by our empirical context: Benin is highly agricultural, with most production coming of agricultural goods, see Appendix B. For example, cotton is one of its main exports. Furthermore, it is easier to track heterogeneity in this set-up, which comes through only one source: the marginal costs. Nevertheless, this sole source of heterogeneity is sufficient to generate dispersion in market shares which can be mapped to data if it were available. A natural alternative to Cournot competition would be Bertrand competition. However, Bertrand competition would suggest that only one firm stays in the market (the one with the smallest marginal costs), counter to what is commonly observed. Unfortunately, we do not observe data on different quality or prices of similar goods to endow a more complete discrete choice model.

7. Identification of the Structural Model

7.1. Moving to the Data

Let us first make explicit the data requirements to identify and estimate our baseline model. Within each commune and for each firm, we observe an index of the form of state capture at the firm-commune level, $\tau^*_{i,c}$, observable characteristics at the commune level, X_c, electoral uncertainty p_c and observable characteristics of politicians, $W_{j,c}$.[46] Our identification is based on the first order conditions of the model, given by equations (5.4) and (5.5). They allow us to rewrite an appropriately normalized $\tau^*_{i,c}$ as a function of those observables. We focus on this outcome because it is the measure we collected and observe in the data. In contrast, market distortions μ^*_c are unobserved and very hard to collect systematically.

To estimate our model, we clarify three points. First, while our model might appear geared towards incumbents, it still applies to challengers.[47] Second, we must rescale our direct firm capture index from the reduced form section to have support $[0, 1]$ consistent with the model (the variable

[46] Since we unfortunately do not observe either market shares or prices, we cannot directly use the equations from Appendix C.5 for our empirical exercise. However, most of the firm-level variation gets soaked up by commune and politician effects because of the small size of Benin's market, as we describe below.

[47] A firm may still capture a challenger so that, once they are elected, they implement market distortions. Political uncertainty means that the challenger might not be elected and would be unable to implement promised distortions in the next period. Hence, our estimation uses the full sample of politicians, not only incumbents.

assumes the role of a probability in the model - that distortions are kept even when the incumbents are replaced). This rescaling is simply dividing the index by 6. We use the direct capture index as an outcome because it allows for firms to choose a combination of mechanisms, instead of just opting between either direct or indirect forms of capture. This is consistent with our data, where multiple mechanisms are chosen simultaneously, and appropriately maps to the variable τ in the model that can measure the mix of direct control and how that changes. Finally, our model assumes that one firm or a coalition of firms decides aggregate distortions $\mu^*_{i,c}$ within each market (commune-industry level). For our empirical exercise, we focus on there being only one firm per industry and commune which is connected to a politician, and this is the firm deciding market distortions. While this might appear to be a strong assumption (as mentioned in footnote 32 it can be relaxed in the model, but we still need to make assumptions to take it to the data), it is very appropriate for our empirical context. Due to the Beninese market size, few firms are capable of funding electoral campaigns, while others are constrained by their location due to the highly agricultural Beninese economy. For instance, across 42 communes that hold mayor-level elections in our dataset, we observe only 61 economic operators (a proxy for firms) funding electoral campaigns. Out of those 42 communes, 71% (30 communes) have one economic operator-candidate relation, while in the remaining 12 communes, a firm funds more than one candidate in each commune. From conversations with local operators, there also appears to be an almost common knowledge of candidates' funding sources when running for office. Furthermore, it is likely that a firm gives preferences to a firm who donates only to him/herself rather than one who funds them all. Finally, as connected firms are likely to be in the same industry, e.g. cotton, and they are usually connected to only one politician per market, differences in the amount of direct/indirect capture will be mostly due to local market characteristics or politician characteristics. Any weak variation in firm characteristics gets soaked into the commune level ones. As a result, candidates are mostly tied to one firm for funding and when we take our model to the data we index the outcome variables only at the commune level: $\{\mu^*_c, \tau^*_c\}$, with μ^*_c defined for the appropriate firm by equation (5.5).

7.2. Identification

Since both consumer surplus and profits are unobserved, without additional structure we can only hope to identify the aggregate function $\pi_c(\mu_c) + \gamma S_c(\mu_c)$ and not its individual components. For identification of our baseline model we assume the following.

Assumption ID(i): Let $g_c(\mu_c) = \pi_c(\mu_c) + \gamma S_c(\mu_c)$. Then: $log(-g''_c(\mu^*_c)\mu^{*,2}_c) = \alpha + X'_c\beta + \varepsilon_c$, where $\mathbf{E}[\varepsilon_c \mid X_c] = 0$.

Assumption ID(ii): $h(\tau^*_i) = \frac{1}{2}\tau^{*,2}_i$.

Assumption ID(i) is a parametrization for the second derivative of the function $\pi_c(\cdot) + \gamma S_c(\cdot)$. As we saw in Section 5.3, this was the firm's "de-facto" preference after incorporating the payments they had to make to induce effort by the legislator. α, β capture how observable characteristics affect those preferences. They are part of the only function that determines market distortions in the model, see equation (5.5). This assumption is needed as both μ^*_c and $\pi_c(\mu^*_c) + \gamma S_c(\mu^*_c)$ are unobserved and cannot be separately identified. Both of these terms impact the optimal choice of τ^*_c: if either the

amount of distortions or the concavity of its premia increase, then the conditional value of insurance, $\tau_c^*/1-p_c$, is higher. Assumption ID(i) guarantees that we do not have to fully separate between these two (unobserved) effects of μ_c^* on our outcomes (although we could under more structure).[48]

Assumption ID(ii) is a normalization. It is also necessary because of the unobservability of multiple functions: we do not observe $\pi_c(\mu_c) + \gamma_c S_c(\mu_c)$ (i.e. profits and consumer surplus), or the cost of direct control $h(\cdot)$. We cannot separately identify these two unknown functions without a normalization, as they both impact equilibrium behavior through the same equation (5.4).[49]

We discuss identification of the endogenous model from Section 5.3.2 in Appendix C.4. We show that the identification arguments below based on the exogenous model are within the identified set for the endogenous case. These bounds are very tight when $p'(\mu)$ is small. So the empirical specification we pursue can be interpreted as correctly estimating the endogenous case when $p'(\cdot)$ is close to zero, or as estimating a particular specification in the (possibly non-sharp) identified set of the endogenous model.

A second-order Taylor expansion of $\pi_c(0) + \gamma_c S_c(0)$ around $\pi_c(\mu_c^*) + \gamma_c S_c(\mu_c^*)$ yields:

$$\pi_c(0) + \gamma S_c(0) = \pi_c(\mu_c^*) + \gamma S_c(\mu_c^*) + \nabla_\mu(\pi_c(\mu_c^*) + \gamma S_c(\mu_c^*))(-\mu_c^*) + \nabla_\mu^2(\pi_c(\bar{\mu}_c) + \gamma S_c(\bar{\mu}_c))\mu_c^{*,2}, \tag{7.1}$$

where $\bar{\mu} \in (0, \mu^*)$. This expansion allows us to use both equilibrium conditions (5.4) and (5.5). The approximation above is around μ_c^* because the function at 0 is counterfactual to the data: data is only observed at equilibrium levels. The second term on the right hand side of (7.1) is equal to 0 by equation (5.5). As a result, we rewrite (7.1) as:

$$(\pi_c + \gamma S_c)(\mu_c^*) - (\pi_c + \gamma S_c)(0) = -\nabla_\mu^2(\pi_c(\bar{\mu}_c) + \gamma S_c(\bar{\mu}_c))\mu_c^{*,2} \tag{7.2}$$

Plugging in (7.2) and then using Assumption ID(ii) in (5.5) yields:

$$\begin{aligned} \frac{h'(\tau_c^*)}{1-p_c} = \frac{\tau_c^*}{1-p_c} &= \pi_c(\bar{\mu}_c) + \gamma S_c(\mu_c^*) - (\pi_c(0) + \gamma S_c(0)) \\ &= -\nabla_\mu^2(\pi_c(\bar{\mu}_c)) + \gamma_c S_c(\bar{\mu}_c))\mu_c^{*,2}. \end{aligned} \tag{7.3}$$

Taking logs over both sides yields and using Assumption ID(i) results in our final equation:

$$\begin{aligned} log\left(\frac{\tau_c^*}{1-p_c}\right) &= log(-\nabla_\mu^2(\pi_c(\bar{\mu}_c) + \gamma_c S_c(\bar{\mu}_c))\mu_c^{*,2}) \\ &\approx \alpha + X_c'\beta + \varepsilon_c, \end{aligned} \tag{7.4}$$

where the last line is an equality up-to the difference of second derivatives at $\bar{\mu}_c$ and μ_c^*. α, β are then identified under standard regularity conditions on X_c, allowing us to pin down the mechanisms that affect equilibrium direct control, τ_c^*. In the model, there are two such channels: electoral uncertainty,

[48] While Assumption ID(i) is a function of equilibrium μ_c^*, it can be easily rewritten as an assumption on $log(-g_c''(g_c'^{-1}(0))(g_c'^{-1}(0))^2)$ by using equation (5.5). We further note that Assumption ID(i) can be derived from stronger (but easier to interpret) assumptions, such as: (i) the function $\pi_c(\mu_c) + \gamma S_c(\mu_c)$ is quadratic, with its second derivative being common across communes, and (ii) $log(\mu_c^*) = \alpha + X_c'\beta + \varepsilon_c$. The linearity structure in Assumption ID(i) can be also easily weakened to $log(-g_c''(\mu_c^*)\mu_c^{*,2})$ being approximated by a polynomial. Machine learning methods (e.g. LASSO or Square-root LASSO) can be used to decrease the dimensionality of the problem. We explore this specification in the next section.

[49] From equation (5.4), it is immediate that multiplying both $h'(\cdot)$ and $\pi_c(\mu_c) + \gamma S_c(\mu_c)$ by a constant (and as a consequence, multiplying their derivatives by that same constant) yields the same solution for τ_c^*.

p_c and the amount of distortions, μ_c^*. Both change the value of controlling bureaucrats, for example. While they could interact in complex and nonlinear ways, in equilibrium, only the second affects the conditional outcome $\tau_c^*/(1-p_c)$. This is an exclusion restriction provided by the model and a key feature that allows us to perform counterfactuals (see Section 9) by creating a clear chain of causality. Changes to observable characteristics X_c affect market distortions μ_c^* which then affect the outcome of interest. There is no "reverse" causality in this structure.

Finally, we note that γ can be allowed to vary at the politician level. While we can never fully identify the scale of γ, we observe politician characteristics, an information left unused in our identification arguments above. Yet, politician characteristics can only affect τ_c^* in (7.3) through different welfare weights γ, as those change the cost of inducing distortions μ^*. Hence, if we observe different amounts of direct capture across identical communes with different politicians, we can identify (the sign) of which politician characteristics map into higher or lower values of γ.

8. Structural Estimation Results

We now estimate equation (7.4), where the left hand side is measured by our direct capture index at the commune-firm level, τ_c^*, divided by $1-p_c$, where p_c is the margin of victory in that commune in 2015. As in the reduced form section, the latter is a proxy that measures political uncertainty faced by campaigning mayors. We restrict the sample to politicians at commune-level races, instead of including political brokers.

We consider different specifications - each mapping to a different set of assumptions about the function $\pi_c(\mu_c^*) + \gamma S_c(\mu_c^*)$. In the first set of specifications, we use only commune-level characteristics, not allowing for heterogeneity in politician characteristics (i.e. the parameter γ measuring the legislator's weight on consumer welfare vis-à-vis the firm is constant across the sample). As covariates, we include the effective number of parties capturing political characteristics,[50] executed fiscal expenses in 2013 as a measure of tax revenue, and population as a proxy for market size, as well as department fixed effects. In this set-up, commune and department characteristics fully capture the variation in consumer surplus and profits. The other set of specifications, though, allow γ to vary by politician characteristics. Due to our reasonably high number of variables relative to observations, we also estimate the specifications using LASSO to decrease the dimensionality of our problem.[51] Our main parameters of interest in the first set of specifications are the commune-level characteristics, as the fixed effects are nuisance parameters. For the second set of specifications, we prefer to present the average marginal effects for commune level and politician level characteristics. There are many cross-variable interactions and the average marginal effect is able to capture the relevant margin of each of the variables of interest.

[50] For the structural results, we keep the same covariates as those in the reduced form, except for commune level turnout in 2015. We drop turnout because it is very highly negatively correlated to population in the subset used for estimation. This subset is smaller than the one used in the previous section because we drop the subset of political brokers.

[51] In practice, we assume that $\gamma_i = W_i'\delta + \eta_i$. Substituting this into (7.1) yields an analogous equation to (7.4), except for the additional linear and interaction terms of politician characteristics and commune-level ones. Our LASSO specification includes second order interactions of commune-level characteristics to allow for a "flexible" functional form to be selected by the procedure.

The results for all specifications are shown in Table 6. Standard errors are clustered at the department level for the OLS specifications. While some specifications produce admittedly noisy estimates due to the small sample size, we still find evidence supporting our mechanisms. First, across specifications we find that population (i.e. market size) is associated with increasing direct control. This is intuitive and consistent with our framework: communes with larger population, all-else constant, have larger market sizes that would yield higher profits to the firm. In those markets, we would expect higher distortions to be chosen and there would be more value for direct control conditional on the same electoral uncertainty. We also find limited evidence that tax/state capacity is negatively associated with direct forms of state capture. Communes with less state capacity should be better able to implement policies that benefit connected firms (whether due to less monitoring of local legislator-firm contractual arrangements, or through an increase in rents conditional on market size). The importance of taxation and state capacity for the establishment of government control (which would allow stricter rules on the implementation of market distortions) is considered by Sanchez de la Sierra (2020), for example.

Moving on to politician characteristics, our specifications in Columns 4-6 suggest that younger politicians and, to a much smaller extent, incumbents and those who are more experienced in politics (i.e. those who have run for office before), ceteris paribus, have higher amounts of direct capture by firms (e.g. more patronage and firm control over of bureaucrat appointments). The evidence of younger politicians associated with higher levels of direct control is consistent with the role of career concerns (Mattozzi and Merlo, 2008), as dynamic considerations would appear more salient to younger mayors and elections in this setting are reliant on firms for campaign funding. We conjecture that younger mayors also have less bargaining power with firms, which would yield similar implications. The model allows us to interpret this result as a higher preference for firms relative to consumers by these politicians. Everything else constant, more direct control by firms can only come from higher values of de-facto firm preferences ($\pi_c(\cdot) + \gamma_j S_c(\cdot)$) from equation (5.4). In turn, this would imply higher equilibrium market distortions, μ_c^*. It is really the structural model that allows us to draw conclusion about unobserved market distortions (such as monopoly power, or favorable regulations) from the observable measured of state capture. Meanwhile, the results for incumbents and experienced politicians are consistent with such legislators having longer lasting connections. Having a longer history with firms could be associated with a higher willingness to help firms relative to voters. In our model, such differences in outcomes due to politician characteristics can only be due to a higher valuation of firms' profits relative to consumer welfare, i.e. a lower γ.

We now use our model to quantify the effects of different policies aimed at curbing state capture on actual measures of government control and welfare. This is an important consideration and motivation for our structural exercise.

9. Comparative Statics and Counterfactuals

We conduct three sets of policy exercises. We study the effects of (i) an improvement in bureaucratic selection, (ii) an increase in electoral uncertainty, and (iii) an improvement in politician selection on government control and the contracts between politicians and firms.

The aim of these exercises is to quantify whether different policies to curb corruption and state capture actually do decrease government control by firms. Each proposed policy has been suggested by the literature as desirable due to their possibility of making state capture more costly. However, our results differ from previous models because, in our setting, firms have a larger set of possible mechanisms to interact with the government. Policies thought to reduce the total amount of capture along an intensive margin (capture/non capture) might not do so when firms have an extensive margin of the form in which these contracts take place. We present each exercise in turn, reviewing existing evidence and the new results in our context. We summarize the signs of our conclusions in Table 7. We emphasize that all of the mechanisms analyzed below are still present in the model with endogenous electoral competition - see Section C.3, although the signs from Table 7 might require more structure to hold then.

9.1. The Effects of Bureaucrat Selection

Improving the selection of bureaucrats has often been viewed as desirable due to their importance in the functioning of institutions. Better institutions could positively impact political stability and economic development (see for instance, early work as Seligman, 1964, and most recently Acemoglu and Robinson, 2008; Bai and Jia, 2016 and references therein) and, possibly, curb state capture. One example of such policies is civil service reform. Better (e.g. less crony) bureaucrats would be less likely to implement distortive policies or, at the very least, it would be more expensive to convince them to do so. This type of policy also appears implementable: nationwide exams for state positions appear effective, e.g. Bai and Jia (2016), and they are already present in various countries.

Within the context of our model, improved bureaucrat selection can be interpreted as increasing the cost of direct control (i.e. $h(\cdot)$ and $h'(\cdot)$ increase), see Section 5.3.1. Let us consider the effects of an increase in $h(\cdot)$ on government capture by increasing the cost of direct control by a factor of $\alpha_b > 1$.

It is immediate from equation (5.5) in the baseline model that improving bureaucrat selection does not change the amount of distortions, μ^*. These distortions are only affected by the marginal benefits (increased profits to the firm) and costs (decreased consumer surplus). This is because distortions only take place along the path of actions in which they are are kept. While this occurs with probability $p_c + (1-p_c)\tau_{i,c}$ ex-ante, distortions are only implemented once that uncertainty is realized - so those values do not matter for the amount of distortions chosen. Nevertheless, bureaucrat selection does affect the amount of direct control.

Using Assumption ID(ii) in the counterfactual setting, we have that $h(\tau_{i,c}) = \frac{\alpha_b \tau_{i,c}^2}{2}$. Substituting this into (7.4) we find that:

$$\frac{\alpha_b \tau_{i,c}}{1-p_c} = \alpha + X_c'\beta + \varepsilon_i. \tag{9.1}$$

We find that the counterfactual amount of direct control is given by $\tau_{i,c}^{*,cf} = \frac{\tau_{i,c}^*}{\alpha_b} < \tau_{i,c}^*$, since the right hand side is unchanged. This means that the amount of direct control decreases proportionally

with the increase in cost. The firm substitutes away from direct to indirect control, while keeping the amount of distortions unchanged.

We conclude that civil service reforms generate a more nuanced set of effects than simply improving welfare. Government capture as defined in (5.1) is lower with better bureaucrat selection, but not as low as it would be in the absence of distortions. Hence, our model suggests a countervailing effect to that in Bai and Jia (2016). While better civil servants might improve political stability (possibly through the career prospects channel), in the presence of state capture, their main impact might be in affecting the mechanism of firm control.[52]

9.2. The Effects of Higher Political Turnover/Less Incumbency

An alternative to curb state capture could be to stimulate more competitive elections, generating a higher turnover of incumbent politicians. Evidence such as Ferraz and Finan (2011) suggests that corruption can decrease with political accountability, and political accountability can be implemented through competitive elections (see Alt et al., 2011 for an example). This could be desirable from the consumers' point of view, as political competition could improve voter welfare by changing the economic policies enacted by legislators (Besley and Case, 1995) or by the availability of more policy options voters can choose from (Lee et al., 2004). While changing electoral institutions might appear hard, the effects of competition could be partially achieved through simple rules, including term limits or audits (Avis et al., 2018, Smart and Sturm, 2013).

However, contrary to such possible welfare gains, we find that increasing political competition has an unfortunate countervailing effect in state capture that generates net welfare losses. To see this, let us consider the effect of increasing political competition in commune c from $p_c > 1/2$ to $p_c^{cf} < p_c$, i.e. $1 - p_c^{cf} > 1 - p_c$.

Analogous to the previous exercise, this policy would not affect market structure in the baseline model, as it does not affect μ^*. Equilibrium distortions only respond to changes in the benefits or costs to firms and voters. Using this result in equation (5.4), we see immediately that an increase in political competition only affects the form of state capture. In contrast to the previous exercise, however, an increase in political competition increases the amount of direct capture. Applying equation (5.1) implies that the total amount of government control increases in response to higher political competition.

The intuition for this result comes from Lemma 5.3. More electoral uncertainty is harmful in terms of state capture: it implies a higher uncertainty for both the firm and the politician. This increases the relative value of direct control, which insures that the firm's payments to get μ^* are not wasted. The fact that electoral competition may exacerbate underlying incentives for distortions is also found in Shleifer and Vishny (1994); Campante et al. (2009) on corruption outcomes, and Fergusson et al. (2020) on clientelistic exchanges.

[52] For instance, Ujhelyi (2014) points out that civil service reforms can induce changes to how government spending occurs, and possibly in directions that are not necessarily welfare improving. We complement this insight by showing that such reforms might not even induce the amount of benefits once thought of.

As a result, electoral competition alone may not lead to democratic consolidation when firms can switch the type of state control with equal results (in our model, the market distortions, such as increased regulation and taxes on competitors). We expand on this point in our conclusions.

9.3. Improving the Selection of Politicians

We now consider the role of improving the selection of politicians on state capture and welfare. In the model, this can occur by having legislators with a higher relative valuation for consumer welfare, γ. In contrast to the previous exercises, we show that this type of policy is indeed able to decrease both market distortions and direct control, decreasing overall government control by firms. We then quantify this effect in our data.

From equation (5.5), it is immediate that $\frac{\partial \mu^*}{\partial \gamma} < 0$ by the Implicit Function Theorem and the concavity of $\pi_i(\mu) + \gamma S(\mu)$. Intuitively, with a higher γ, it is more costly for the firm to incentivize the legislator to implement market distortions. Since μ^* decreases, the strategic complementarity of τ^* through equation (5.4) implies that $\frac{\partial \tau^*}{\partial \gamma} < 0$ as well. A decrease in μ^* reduces the value of having direct control. This implies a smaller value of the insurance that direct control gives. In the case of a local car dealer who wants to capture the government in a commune, (s)he must now provide more compensation to the mayor for the same amount of desired distortions, since the mayor is less willing to propose these policies.

Empirically, we can quantify the effects of replacing the current crop of mayoral candidates with others who are less prone to capture. In light of the results from Table 6, we calculate the average effects from replacing the younger politicians by those 10 years older. From Table 6, the average marginal effect from increasing the age by 10 years is estimated between $[-0.14, -0.08]$ depending on whether the results from Column 4 or 5 are used. Given our log-linear specification, this suggests that replacing politicians by older counterparts decreases the amount of direct control τ_c^* by approximately $1 - p_c \times (e^{-0.14} - 1)\% \approx 0.1(1 - p_c)$. This is a 10% reduction in the normalized outcome, which can be close to a 5% reduction of direct control in competitive races - a quantitatively meaningful amount.

In conclusion, changes in γ are able to decrease market distortions through making it more costly to sway the politician. How can one implement such changes? One possibility is by grassroots movements that can counter the firm's influence on politicians, a possibility suggested in Fowler and Shaiko (1987). These movements can pressure incumbents to enforce policies that benefit consumers or they can act by selecting and advertising alternative candidates who weigh consumers/voters more heavily. Examples of the first include consumer advocates who inform the public about ongoing legislation and pressure the government to not implement policies that distort consumer surplus, e.g. increase monopolies. For the second, examples include political movements geared towards representation of certain groups or who push for implementation of policies that benefit these groups.

10. Conclusion

We have considered how firms choose to enact state capture: whether through more direct (e.g. appointment or control of bureaucrats) or indirect means (e.g. policy modifications in campaigns).

While previous literature has shown the presence of many ways in which business and politicians strategically interact, possibly to the detriment of voters and consumers, we have focused on how firms strategically choose to interact with politicians and the effects of these decisions on consumer welfare. We showed that higher political uncertainty (i.e. more electoral competition) is associated with more direct forms of capture, higher government control by interest groups and less transfers between firms and corporations by using a novel collected dataset in Benin. These reduced form findings were also present in an alternative specification exploring the 2018 national electoral reform in Benin which collapsed the number of parties competing for power at local levels.

We rationalized these observations through a model of strategic interactions between politicians and firms under uncertainty: while firms want market distortions to increase their profits; political uncertainty implies that their captured politicians might not be present to implement them if they lose the election. Direct control then works as an insurance mechanism, "completing the contract" between firms and the state. Such direct control is most beneficial when electoral uncertainty is higher, as insurance becomes more valuable. The model, together with structural estimates, then show that measures suggested to decrease state capture, including improved selection of bureaucrats and legislators, might not actually accomplish those goals. This is because we introduce another margin through which businesses can react: they can change how they capture the government, circumventing the effect of decreasing the actual intensity.

We conclude with a corollary of our results, a possible "electoral competition paradox". While electoral competition is generally thought to be desirable and to strengthen democracy, it can imply a reverse effect by increasing state capture due to increasing returns to government control. When businesses can affect policy decisions, there can be unraveling of the welfare benefits of electoral competition to voters. Such competition can even lead to democratic backsliding: if electoral uncertainty does not yield improvements in consumer welfare, citizens could prefer autocrats who promise policies that do benefit them. This increasing capture can result in the undermining of citizen trust in democracy, currently observed across the world with the rise of populism. Therefore, when firms are connected to politicians, electoral competition is not a panacea. Nevertheless, our exercise suggests that these effects can be deterred by pressure groups and grassroots movements that can counter the strength of firm-politician ties. This can occur through the recruitment of new candidates (our empirical results suggest incumbents and more experienced candidates are associated with more control by firms) and persistent oversight to keep them accountable.

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Tables

TABLE 1. Politician characteristics, and commune and legislative-level variables, descriptive statistics

	Mean	SD	Min	Max	N
Panel A - Politician Characteristics:					
Title: politician (=1) or broker (=0)	0.87	0.33	0	1	213
Current position: Deputy	0.07	0.25	0	1	213
Current position: Minister	0.00	0.07	0	1	213
Current position: Mayor	0.07	0.26	0	1	213
Current position: Municipal Council Member	0.40	0.49	0	1	213
Current position: Cabinet Director	0.01	0.10	0	1	213
Current position: Other	0.45	0.50	0	1	213
Age	46.94	10.40	24	70	213
Years living in region	38.31	16.63	0	70	213
No education	0.02	0.14	0	1	213
Elementary	0.02	0.14	0	1	213
College 1st cycle	0.13	0.34	0	1	213
College 2nd cycle	0.16	0.37	0	1	213
University 1st cycle	0.17	0.38	0	1	213
University 2nd cycle	0.28	0.45	0	1	213
Graduate	0.22	0.41	0	1	213
Member of Political Party	0.98	0.14	0	1	213
Participated in past elections as candidate	0.81	0.39	0	1	213
Participated in past Commune-level Elections	0.88	0.33	0	1	173
Participated in past Legislative-level Elections	0.36	0.48	0	1	173
Participated in past Presidential-level Elections	0.01	0.08	0	1	173
Num. Participations in Commune Elections	1.51	0.85	0	3	173
Num. Participations Legislative Elections	0.54	0.86	0	4	173
Paty switch: different party from last election	0.57	0.91	0	2	209
Paty switch: same party as last election, but other in the past	0.64	0.94	0	2	149
Main change party reason: Ideology	0.45	0.50	0	1	161
Main change party reason: Poor project definition	0.30	0.46	0	1	161
Main change party reason: Personal interest	0.50	0.50	0	1	161
Main change party reason: Opposition to movement	0.57	0.50	0	1	161
Main change party reason: Movement towards opposition	0.15	0.36	0	1	161
=1 if running for Commune Elections (2020); 0 for Legislative (2019)	0.55	0.50	0	1	213
First time runner	0.27	0.44	0	1	213
Hold political position in the past	0.77	0.42	0	1	213
Hold private position in the past	0.38	0.49	0	1	213
Incumbent Mayor	0.07	0.26	0	1	213
Incumbent Deputy	0.07	0.25	0	1	213
Pane B - Commune-level variables:					
Winning margin (1st-2nd runner party, 2015)	0.16	0.17	0	1	42
Winning margin (2nd-3rd runner party, 2015)	0.18	0.14	0	0	37
Laasko-Taagepera Effective Number of Parties Index (2015)	2.74	0.79	1	5	42
Molinar Effective Number of Parties Index (2015)	5.56	4.34	1	22	42
Electoral Reform (=1 if Laakso-Taagepera Index>2.5, 0 otherwise in 2015)	0.57	0.50	0	1	42
Electoral Reform (=1 if Molinar Index>2.5, 0 otherwise in 2015)	0.76	0.43	0	1	42
Turnout (2015)	0.60	0.09	0	1	42
Average luminosity (corrected; 2013)	9.51	26.50	0	142	35
Average luminosity (not corrected; 2013)	8.42	9.76	4	60	42
Executed Fiscal Expenditure (Mill CFA - 2013)	615	1,756	62	11,209	41
Population (GHS-2015)	165,490	129,028	46,446	737,284	42
Panel C - Legislative district-level variables:					
Winning margin (1st-2nd runner party, 2015)	0.18	0.15	0	1	20

Note: Panel A describes the characteristics of the subsample of 213 respondents who plan to contend in the legislative or commune-level elections of 2019 and 2020, respectively. This subsample is used for the reduced form estimates of Table 3. For descriptive statistics of the full sample of 311 respondents for Panel A, please see Table D-1. Panel B and C show descriptive statistics for communes and legislative districts that match the location of the subsample of 213 respondents.

TABLE 2. Forms of state capture, descriptive statistics

	Mean	SD	Min	Max	N
Forms of capture: politicians running for mayor in 2020					
Promotion of specific policies	0.42	0.50	0	1	117
Public goods to specific market/sector	0.78	0.42	0	1	117
Patronage: firms' friends or family	0.40	0.49	0	1	117
Nomination of crony to bureaucratic position	0.38	0.49	0	1	117
Nomination of candidate from firm to office	0.15	0.35	0	1	117
Program modification	0.10	0.30	0	1	117
Refund/Reimbursement	0.03	0.16	0	1	117
Bureaucratic recruitment control	0.16	0.37	0	1	117
National/Department/Local Budget line	0.04	0.20	0	1	117
Direct Capture Indicator	0.34	0.29	0	1	117
Direct Capture Index	2.99	1.19	0	6	117
Direct Capture Indicator (after increase in num. of candidates; 2018)	0.66	0.48	0	1	114
Direct Capture Index (after increase in num. of candidates; 2018)	4.33	1.99	1	6	114
Forms of capture: politicians running for MP in 2019					
Promotion of specific policies	0.44	0.50	0	1	96
Public goods to specific market/sector	0.76	0.43	0	1	96
Patronage: firms' friends or family	0.39	0.49	0	1	96
Nomination of crony to bureaucratic position	0.42	0.50	0	1	96
Nomination of candidate from firm to office	0.20	0.40	0	1	96
Program modification	0.08	0.28	0	1	96
Refund/Reimbursement	0.06	0.24	0	1	96
Bureaucratic recruitment control	0.12	0.33	0	1	96
National/Department/Local Budget line	0.06	0.24	0	1	96
Direct Capture Indicator	0.32	0.29	0	1	96
Direct Capture Index	2.94	1.21	1	6	96
Direct Capture Indicator (after increase in num. of candidates; 2018)	0.59	0.50	0	1	94
Direct Capture Index (after increase in num. of candidates; 2018)	4.19	1.96	1	6	94

Note: This table describes forms of state capture used by corporations according to the subsample of 213 respondents who plan to contend in the legislative or commune-level elections of 2019 and 2020, respectively.

TABLE 3. Effect of electoral competition on firms' choices of direct capture

	Panel A: Dependent variable - direct capture indicator[a]					
	Commune election				Legislative election	
	(1)	(2)	(3)	(4)	(5)	(6)
Winning margin (1st-2nd runner)	-0.1258*	-0.4793**	-0.4536*		0.1197	0.1111
	(0.0575)	(0.1825)	(0.2093)		(0.1435)	(0.1481)
Winning margin (2nd-3rd runner)				0.0429		
				(0.1909)		
Observations	112	112	112	94	96	95
R-squared	0.023	0.166	0.258	0.216	0.146	0.185
Politician Controls[b]			✓	✓		✓
Commune Controls[c]	✓	✓	✓	✓		
Department FE		✓	✓	✓	✓	✓
SE Department-level	✓	✓	✓	✓	✓	✓
	Panel B: Dependent variable - direct capture index[a]					
	Commune election				Legislative election	
	(1)	(2)	(3)	(4)	(5)	(6)
Winning margin (1st-2nd runner)	-0.2156***	-0.4886***	-0.4696***		0.0849	0.0723
	(0.0677)	(0.1040)	(0.1379)		(0.1303)	(0.1634)
Winning margin (2nd-3rd runner)				0.0653		
				(0.1879)		
Observations	112	112	112	94	96	95
R-squared	0.047	0.180	0.260	0.229	0.107	0.136
Politician Controls[b]			✓	✓		✓
Commune Controls[c]	✓	✓	✓	✓		
Department FE		✓	✓	✓	✓	✓
SE Department-level	✓	✓	✓	✓	✓	✓

Notes: Standard errors in parentheses are clustered at the department level, with the following significance-levels: *** 1%; ** 5%; and * 10%, that refer to two-sided t-tests. [a] Direct capture indicator is a variable that averages forms of capture indicators at the politician level, classified as either direct or indirect. Direct capture index ranges from 0 to 6, with 6 the highest degree of capture. See Section 3 for more details on both outcomes. The dependent and independent variables are measured in standardized terms. [b] Politician-level covariates include age, university education, if politician changed party from last election (2015), enrollment to a party different from the President's party/coalition and a dummy for incumbency. [c] Commune-level covariates include turnout in 2015, executed fiscal expenses in 2013, effective number of parties and population in 2015.

TABLE 4. Politician and commune-level characteristics in communes affected and not affected by the 2018 Electoral Reform

	Mean Control	Mean Treatment	Diff	Diff. S.E.	p-value
Panel A - Politician characteristics:					
Title: politician (=1) or broker (=0)	0.878	0.765	0.113	0.073	0.125
Current position: Municipal Council Member	0.551	0.441	0.110	0.094	0.245
Current position: Other	0.408	0.515	-0.107	0.094	0.258
Age	47.367	45.029	2.338	1.989	0.242
Sex	1.980	1.985	-0.006	0.024	0.816
Years living in region	43.041	37.485	5.556	2.652	0.038
Highest Education: Elementary or College	0.408	0.368	0.041	0.092	0.660
Highest Education: University (1st cycle, 2nd or Graduate)	0.510	0.632	-0.122	0.093	0.190
Paty switch: different party from last election	0.490	0.677	-0.187	0.174	0.284
First time runner	0.163	0.294	-0.131	0.080	0.103
Hold political position in the past	0.776	0.676	0.099	0.085	0.244
Hold private position in the past	0.245	0.397	-0.152	0.088	0.086
Opposition party (not part of President's Party/Coalition)	0.367	0.279	0.088	0.088	0.317
Incumbent	0.041	0.044	-0.003	0.038	0.931
Corporate financing (Mill CFA)	44.573	37.611	6.962	22.071	0.753
Panel B - Commune characteristics:					
Turnout (2015)	0.609	0.548	0.061	0.020	0.002
Laasko-Taagepera Effective Number of Parties Index (2015)	2.022	3.446	-1.424	0.115	0.000
Molinar's Effective Number of Parties Index (2015)	3.108	9.311	-6.204	0.875	0.000
Winning margin (1st-2nd runner party, 2015)	0.199	0.134	0.065	0.031	0.041
Average luminosity (not corrected; 2013)	6.352	12.477	-6.125	2.195	0.006
Average luminosity (corrected; 2013)	4.704	18.963	-14.259	6.509	0.031
Executed Fiscal Expenditure (Mill CFA - 2013)	291	1,494	-1,203	417	0.005
Population (GHS-2015)	158,156	260,238	-102,081	36,991	0.007

Note: This table shows two-sided t-tests comparing communes affected (had more than 2.5 effective parties in 2015 measured by Laakso-Taagepera Index) and not affected (less than 2.5) by the 2018 Electoral Reform. We use the subsample of 117 respondents who plan to contend in the commune-level elections of 2020 for Panel A and the sample of communes described in Table 1 Panel B.

TABLE 5. Effect of Electoral Reform on firms' choices of direct capture

Dependent variable:	Direct Capture Indicator[a]			Direct Capture Index[a]		
	(1)	(2)	(3)	(4)	(5)	(6)
Electoral Reform[d] (decrease in uncertainty)	0.0031	-0.1941	-0.2611**	-0.0220	-0.1425	-0.2066**
	(0.0587)	(0.1578)	(0.1179)	(0.0643)	(0.1315)	(0.0846)
Observations	112	112	112	112	112	112
R-squared	0.023	0.139	0.257	0.045	0.150	0.251
Politician controls[b]			✓			✓
Commune controls[c]	✓	✓	✓	✓	✓	✓
Department FE		✓	✓		✓	✓
SE Department-level	✓	✓	✓	✓	✓	✓

Notes: Standard errors in parentheses are clustered at the department level, with the following significance-levels: *** 1%; ** 5%; and * 10%, that refer to two-sided t-test. [a] Direct capture indicator is a variable that averages forms of capture indicators at the politician level, classified as either direct or indirect. Direct capture index ranges from 0 to 6, with 6 the highest degree of capture. See Section 3 for more details on both outcomes. The outcomes are measured in standardized terms. [b] Politician-level covariates include age, university education, if politician changed party from last election (2015), enrollment to a party different from the President's party/coalition and a dummy for incumbency. [c] Commune-level covariates include turnout and winning margin in 2015, executed fiscal expenses in 2013, and population in 2015. [d] Electoral Reform=1 if Laakso-Taagepera Index>2.5 in 2015, 0 otherwise.

TABLE 6. Results - Structural Estimates

	Mayor elections - no Preference Heterogeneity			Mayor elections - Preference Heterogeneity		
	OLS		LASSO	OLS (marginal effects)		LASSO
Effective Number of Parties Index (2015)	-0.1859**	-0.3083***	-0.0569	-0.2024*	-0.2516***	
	(0.0792)	(0.0534)		(0.0976)	(0.0332)	
Executed Fiscal Expenditure (2013)	-0.0000**	-0.0003		-0.0002	-0.0003	
	(0.0000)	(0.0002)		(0.0003)	(0.0003)	
Population (GHS-2015)	0.0610**	0.1725**		0.0671	0.1998*	0.0196
	(0.0234)	(0.0768)		(0.0848)	(0.1009)	
Age				-0.0135**	-0.0075*	
				(0.0046)	(0.0035)	
Incumbent				0.4281	3.3224*	
				(1.5917)	(1.8272)	
Highest Education: University (1st cycle, 2nd or Graduate)				-0.2309	-0.2025*	
				(0.2585)	(0.1114)	
First time runner				-1.8644	-0.3340	-0.0132
				(1.2706)	(1.4253)	
Observations	92	92	92	92	92	92
R-squared	0.0875	0.3036		0.2464	0.4616	
Politician Controls[a]				✓	✓	✓
Commune Controls[b]	✓	✓	✓	✓	✓	✓
Department FEs		✓	✓		✓	✓
SE Clustered at Department-level	✓	✓	✓	✓	✓	✓

Notes: We present two sets of results: one that assumes no preference heterogeneity by politicians (i.e. γ from the model is constant, in which case politician covariates are not used for structural estimation), and another allowing γ to vary, using politician characteristics interacted with commune characteristics. The first two columns in each panel are OLS estimates, and the third is a LASSO estimate using 3-fold Cross-Validation (CV) for the penalization parameter. For OLS estimates, standard errors in parentheses are clustered at the department-level. Significance-levels: *** 1%; ** 5%; and * 10%, that refer to two-sided t-tests. Direct capture index at the firm-commune level ranges from $[0, 1]$, where 1 is the highest degree of capture. We categorize capture demands just as in Table 3. The outcome is given by the log of this index divided by 1-Winning Margin in 2015 at the commune level, i.e. $log(\tau_{i,c}/1 - p_c)$, an output from our structural model. For the last three columns, we do not present the interaction terms for parsimony (as they do not present additional qualitative insights).

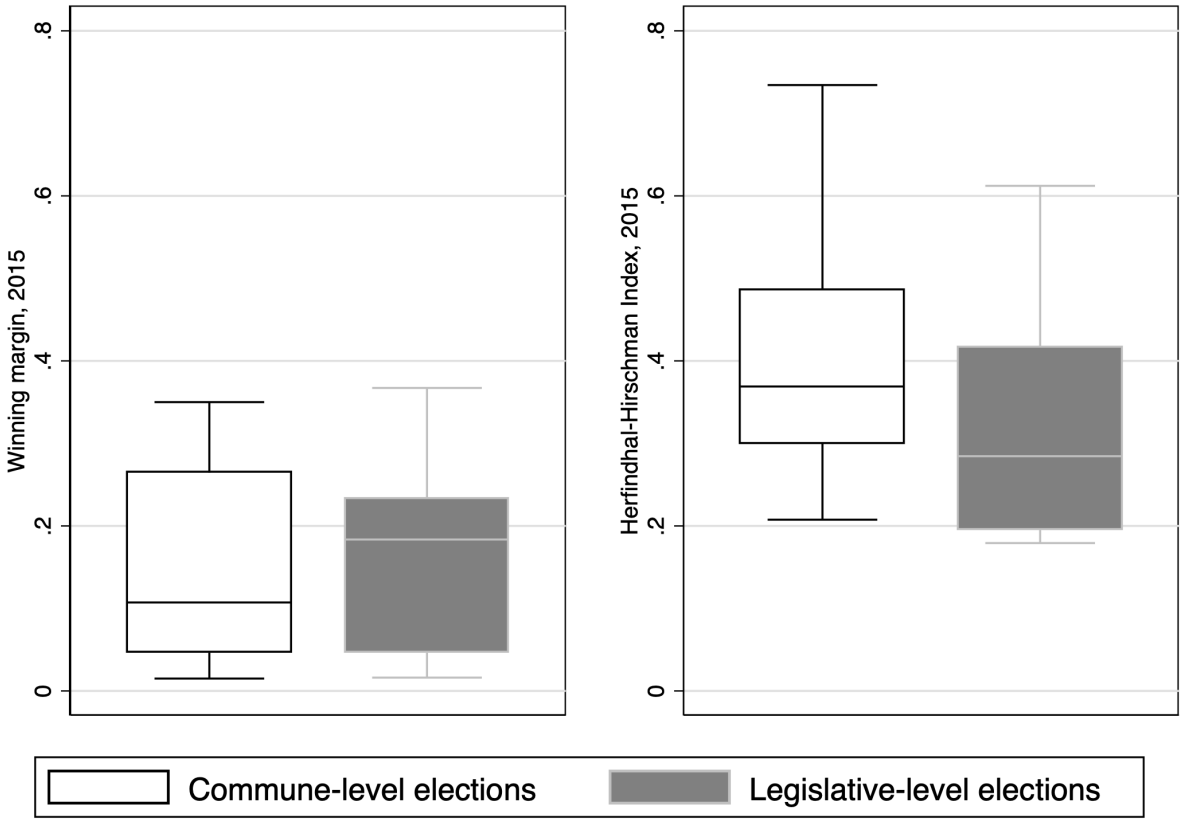
TABLE 7. Summary of the Comparative Statics/Counterfactuals

	Counterfactual		
Map to the Model:	Improved Bureaucrat Selection $\nearrow h(\cdot)$	Increased Electoral Competition $\swarrow p$	Improved Politician Selection $\nearrow \gamma$
Change in Market Distortions, μ^*	0	0	(–)
Change in Direct Control, τ^*	(–)	(+)	(–)

Notes: We summarize the signs of the results for the policy exercises considered in Section 9 using our baseline theoretical model. We show whether each policy experiment discussed in that section generates an increase (+), decrease (–) or no change (0) to the outcomes of interest: market distortions, μ^* and the amount of direct control, τ^*.

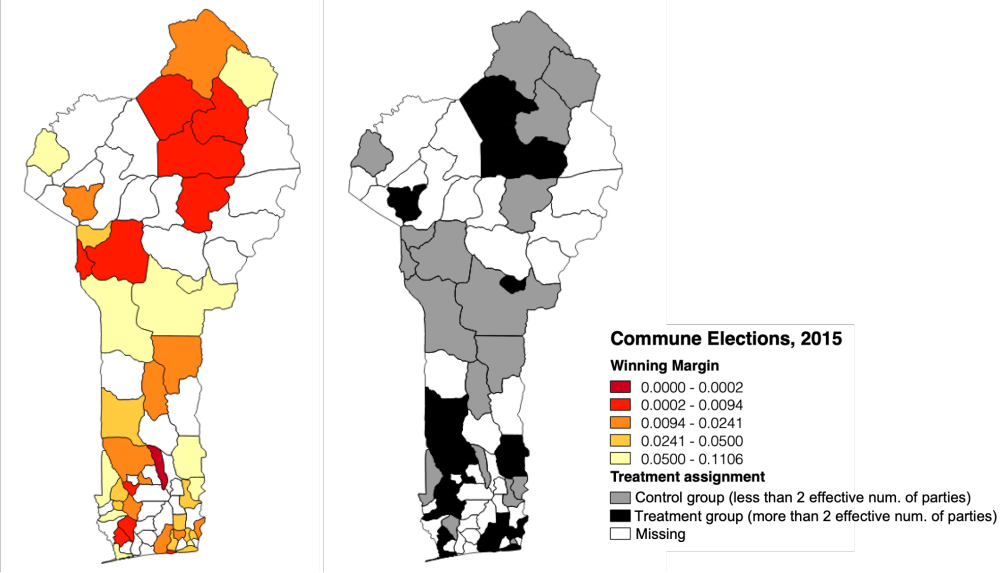
Figures

FIGURE 1. Electoral Competition in Benin, 2015



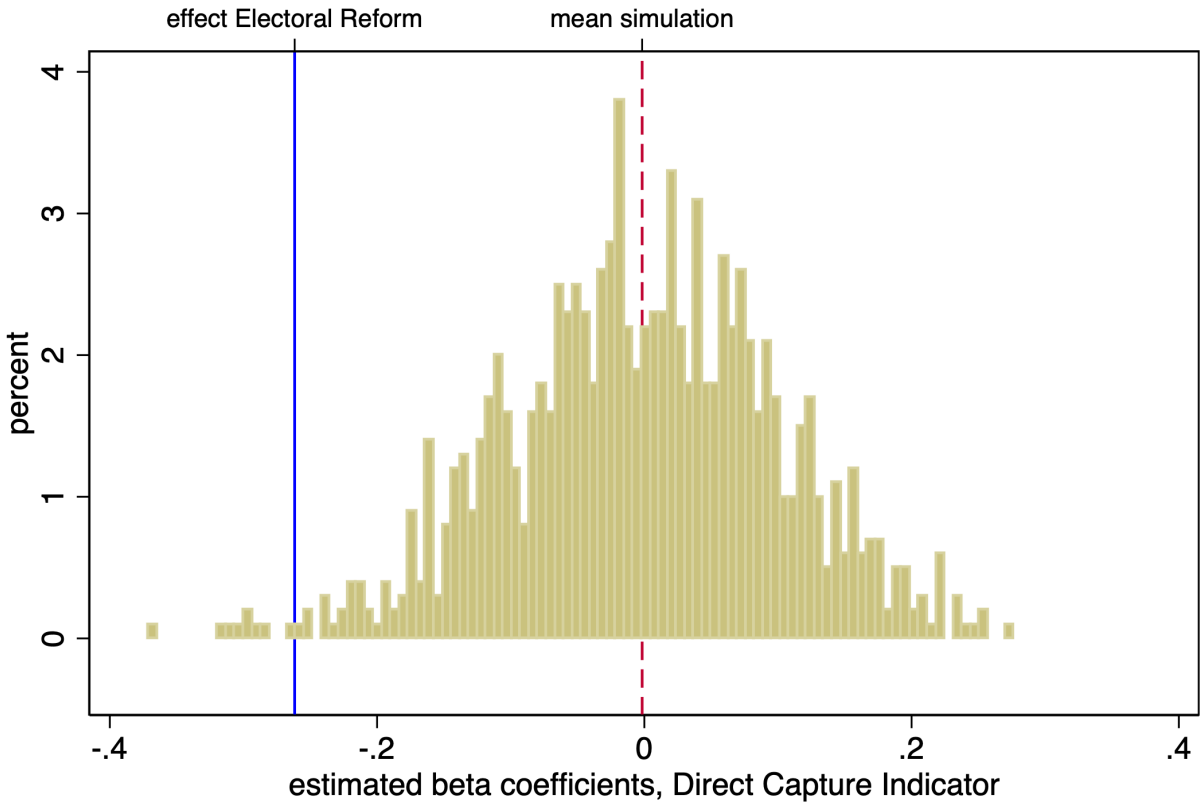
Note: Figure 1 presents the box plot of two benchmark measures of electoral competition, the results margin (left-hand plot) and the vote share concentration by larger parties (right-hand plot). Boxes display the 25, 50 and 75th percentiles (horizontal lines from bottom to top) while the lower and upper T show the minimum and maximum, excluding outliers (values 1.5 times larger -or smaller- than the maximum -or minimum). The median winning margin of commune and legislative-level elections is 10.7 and 18.4%, while the median Herfindhal-Hirschman Index (HHI) of commune and legislative-level elections is 0.36 and 0.28, respectively.

FIGURE 2. Winning margin and Electoral Reform spatial assignment in Benin



Note: Figure 2 displays two maps of Benin's administrative commune-level boundaries and the treatment assignment used in the reduced form specifications of section 4. The map to the left describes the winning margin spatial distribution in the 2015 commune-level elections used to estimate equation (4.1) and Table 3. The map to the right shows the treatment assignment spatial distribution of communes affected and not affected by the 2018 Electoral Reform used to estimate equation (4.2) and Table 5. White communes represent missing data in the direct capture outcome (35 out of 77 communes).

FIGURE 3. Placebo test: effect of random allocation of Electoral Reform treatment on firms' choices of direct capture



Note: Figure 3 shows the estimated beta coefficients distribution of 1,000 simulations following equation (4.2). For each simulation we carry a random Bernoulli draw with success rate equal to the proportion of treated municipalities by the Electoral Reform (58.11%). The blue line displays the estimated effect of the electoral reform on direct capture of column (3) of Table 5. The red line shows the average estimated effect of the simulations.

ONLINE APPENDIX (For Online Publication)

Appendix A. Benin's Institutional Background

A.1. Economic Statistics, Current Events and Campaign Funding

Economics and politics are highly intertwined in Benin. In the case of the cotton industry,[53] Patrice Talon, the largest cotton exporter, used to finance politicians' electoral campaigns. Such financing ranged from presidents to local mayors, and a salient case was the first election campaign of former president Thomas Boni Yayi. These investments had high returns for Talon. For instance, in 2008, Talon won the privatization of the cotton division of the National Society for Agricultural Promotion (Sonapra), originally responsible for 80% of export earnings to the government and 45% of total tax revenues. Before the 2012 presidential elections, Talon also won the control of custom duties of the port of Cotonou, whose annual revenues were equivalent to the yearly state budget. Further details on such capture can be found in Kohnert and Preuss (2019) and in Benin's country report in (BTI).

After supporting Yayi's presidential campaigns in both 2006 and 2011, Talon moved to negotiate the biggest public procurement in Benin's history. Yayi, however, decided to stop the collaboration - presumably due to the power unbalance that the procurement would grant Talon. What followed was a clash between both actors leading to a highly uncertain political environment and Talon's exile to France. Talon then financed the campaign of the national assembly president (the second in command after the president) and, given his experience with President Yayi and a highly uncertain competitive electoral environment, Talon decided to return from exile and run for president. He won the 2016 presidential election with 65.37% of the votes.

It is not only at the presidential level that such relationships between businesses and politics occur. In our data, as shown in Table A-1, local and national-level firms account around 14% of total campaign funding. We believe this estimate to be underbiased due to social desirability bias, which we test and assess in Appendix B. Moreover, we find that businessmen invest a total of 7,567,560,000 F CFA ($13,080,443.46) as financial support to politicians. These are drawn from answers by 189 surveyed politicians and brokers for recent elections. On average across elections, the former receive a combined amount of 40,040,000 F CFA ($69,252.750) for campaign financing. Financial compensations hover around 10,900,000 F CFA ($18,838.524) for commune elections in rural areas and 47,600,000 F CFA ($82,288.818) for those in urban areas. These numbers increase with the importance of the election: for example, 37,300,000 F CFA ($64,470.847) and 67,600,000 F CFA ($116,842.61) are invested on the legislative campaign of a candidate in rural and urban locations.

While the political parties' charter, alluded to in Section 2, predicts a support of 1,500,000 F CFA ($2,592.661) and 30,000,000 F CFA ($51,853.789) for commune and legislative campaigns, amongst the 27% of those who know these amounts, 34% find it insufficient for the corresponding elections. This includes past and future candidates for commune and legislative elections. Businesses

[53] Cotton is one of the country's largest exports. Top exports are raw cotton (USD $148M), coconuts, Brazil nuts, and cashews (USD $140M), refined petroleum (USD $74.2M), gold (USD $68.2M) and scrap copper (USD $39.6M) for 2017 using the 1992 revision of the Harmonized System classification. Its top imports are light pure women cotton (USD $503M), palm oil (USD $437M), fake hair (USD $215M), and cars (USD $184M), see the International Trade Database of Gaulier and Zignago (2010) for details.

TABLE A-1. Sources and types of funding, descriptive statistics

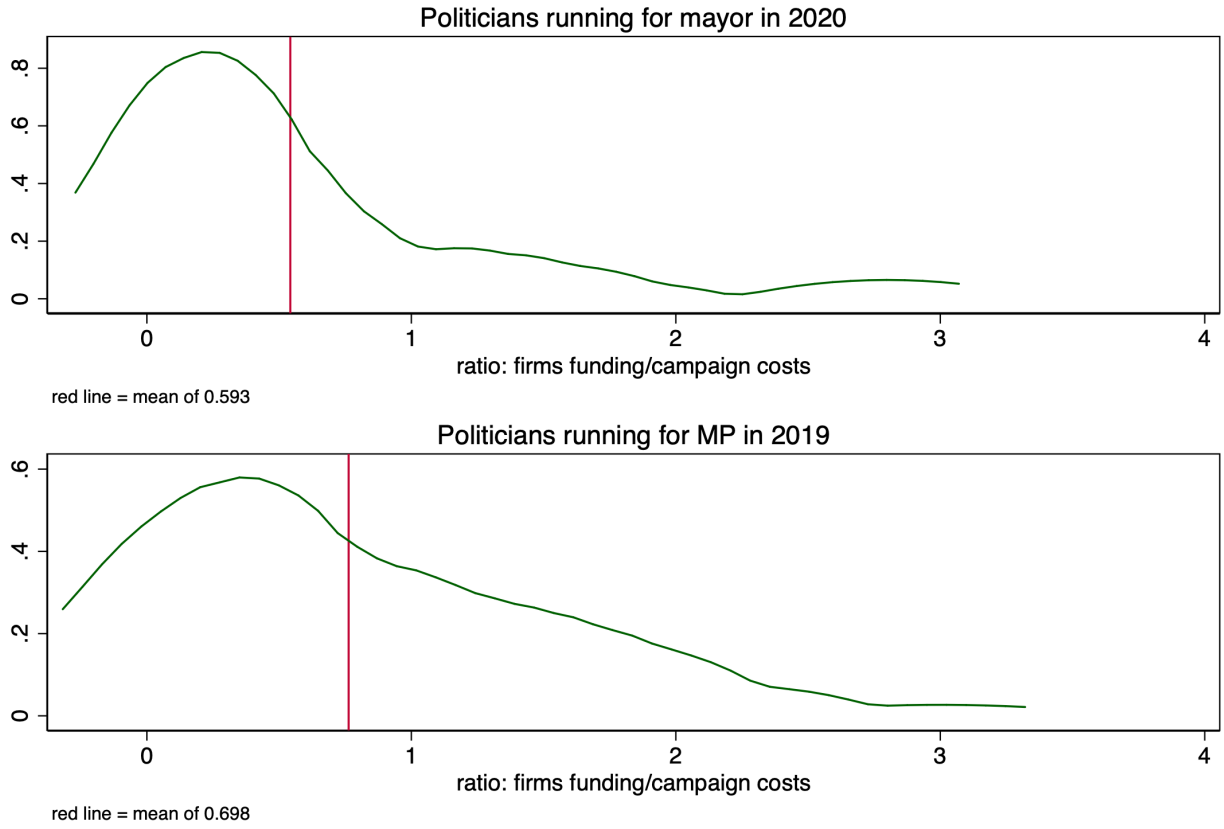
	Mean	SD	Min	Max	N
Sources of funding: respondents running for mayor in 2020					
National funding	0.01	0.04	0	0	117
Department funding	0.00	0.02	0	0	117
Party/Party Coalition funding	0.31	0.26	0	1	117
President/President Party funding	0.21	0.27	0	1	117
Local firms funding	0.10	0.11	0	0	117
National firms funding	0.06	0.10	0	0	117
Local politicians funding	0.05	0.12	0	1	117
Local/National unions funding	0.01	0.02	0	0	117
Other funding	0.39	0.26	0	1	75
Sources of funding: respondents running for MP in 2019					
National funding	0.04	0.12	0	1	96
Department funding	0.00	0.01	0	0	96
Party/Party Coalition funding	0.31	0.24	0	1	96
President/President Party funding	0.20	0.20	0	1	96
Local firms funding	0.09	0.11	0	1	96
National firms funding	0.08	0.10	0	0	96
Local politicians funding	0.03	0.06	0	0	96
Local/National unions funding	0.00	0.02	0	0	96
Other funding	0.38	0.27	0	1	63
Types of funding: respondents running for mayor in 2020					
Financial instruments	0.78	0.42	0	1	117
Goods/non financial services	0.56	0.50	0	1	117
Economic/Political advisors	0.23	0.42	0	1	117
Labor for campaign	0.35	0.48	0	1	117
Provision of space	0.45	0.50	0	1	117
Support for advertisement	0.49	0.50	0	1	117
Other forms of financing	0.02	0.13	0	1	117
Types of funding: respondents running for MP in 2019					
Financial instruments	0.82	0.38	0	1	96
Goods/non financial services	0.65	0.48	0	1	96
Economic/Political advisors	0.25	0.44	0	1	96
Labor for campaign	0.48	0.50	0	1	96
Provision of space	0.46	0.50	0	1	96
Support for advertisement	0.44	0.50	0	1	96
Other forms of financing	0.02	0.14	0	1	96

Note: This table describes sources and types of funding received by the subsample of 186 politicians who plan to run in the legislative or commune-level elections of 2019 and 2020, respectively.

are highly invested in electoral campaigns. Figure A-1 shows that for commune-level elections, firms account for 59.3% of the total campaign costs on average.[54] Furthermore, 15.7% get funding from businesses that surpass the total campaign costs, sometimes with budgets up to 3 to 4 times more than needed.

[54]For legislative elections, 28.2% get funding from firms that surpass their total campaign costs.

FIGURE A-1. Firms funding and campaign costs, by type of election



Note: Figure A-1 presents the ratio of firms funding to campaign costs for commune and legislative elections. Firms' funding includes national and local funding. Campaign costs include all those specified by politicians and political brokers in our survey. Red vertical lines display the average ratio. Averages between election types are different statistically with a significant level of 1%. [55]

Table A-2 presents the distribution of campaign funding by economic activity as self-reported by the 311 respondents surveyed. We observe that 47% of total campaign funds come from the agricultural sector, followed by the industrial (18%), and commerce sectors (10%). These three sectors account for 75% of total campaign funding.

In Section 4, we assess the relationship between electoral competition and firms' preference for direct capture following equation (4.1). We also test a second identification strategy on the effect of the 2018 electoral reform on direct capture preferences. Those findings show that competition increases direct capture by firms. However, given the inflow of corporate resources to electoral campaigns in Benin, one might be concerned that campaign funding may be different in close and non-competitive elections as well as in communes affected and those unaffected by the electoral reform. Table A-3 shows that the results do not change when controlling for reported campaign

[55] Preliminary results of this figure reported in a policy brief by Ch et al. (2019).

TABLE A-2. Campaign financing by economic activity

Economic sector	Campaign financing (Mill. CFA)	Share of total
agriculture	$6,974.85	47.231%
industrial	$2,628.00	17.796%
commerce	$1,423.34	9.638%
unknown	$849.26	5.751%
public	$842.70	5.706%
livestock	$725.00	4.909%
construction	$664.55	4.500%
communications	$231.00	1.564%
transport	$172.75	1.170%
import	$102.30	0.693%
services	$61.25	0.415%
security	$43.20	0.293%
administrative	$23.50	0.159%
education	$12.55	0.085%
sports	$7.70	0.052%
political	$2.00	0.014%
finance	$2.00	0.014%
petroleum	$1.40	0.009%
tourism	$0.21	0.001%

Notes: Table A-2 reports self-reported campaign contributions by corporations by economic activity. We use the full sample of 311 respondents.

funding by corporations relative to Table 3 . Likewise, estimates of Table 5 remain almost unchanged when controlling for campaign funding (see Table A-4).

TABLE A-3. Effect of electoral competition on firms' choices of direct capture, controlling for campaign financing

Dependent variable: direct capture indicator[a]	Commune election				Legislative election	
	(1)	(2)	(3)	(4)	(5)	(6)
Winning margin (1st-2nd runner)	-0.1258*	-0.4793**	-0.4561*		0.1197	0.1759
	(0.0575)	(0.1825)	(0.2211)		(0.1435)	(0.1295)
Winning margin (2nd-3rd runner)				0.0595		
				(0.1870)		
Observations	112	112	112	94	96	95
R-squared	0.023	0.166	0.258	0.240	0.146	0.257
Politician Controls[b]			✓	✓		✓
Commune Controls[c]	✓	✓	✓	✓		
Department FE		✓	✓	✓	✓	✓
SE Department-level	✓	✓	✓	✓	✓	✓

Notes: Standard errors in parentheses are clustered at the department level, with the following significance-levels: *** 1%; ** 5%; and * 10%, that refer to two-sided t-tests. [a] The direct capture indicator is a variable that averages forms of capture indicators at the politician level, classified as either direct or indirect (see Section 3 for more details). The dependent and independent variables are measured in standardized terms. [b] Politician-level covariates include age, university education, if politician changed party from last election (2015), enrollment to a party different from the President's party/coalition, and a dummy for incumbency and campaign financing. [c] Commune-level covariates include turnout in 2015, executed fiscal expenses in 2013, effective number of parties and population in 2015.

TABLE A-4. Effect of Electoral Reform on firms' choices of direct capture, controlling for campaign financing

Dependent variable:	Direct Capture Indicator[a]			Direct Capture Index[a]		
	(1)	(2)	(3)	(4)	(5)	(6)
Electoral Reform[d] (decrease in uncertainty)	0.0031	-0.1941	-0.2595*	-0.0220	-0.1425	-0.2031**
	(0.0587)	(0.1578)	(0.1206)	(0.0643)	(0.1315)	(0.0845)
Observations	112	112	112	112	112	112
R-squared	0.023	0.139	0.258	0.045	0.150	0.253
Politician controls[b]			✓			✓
Commune controls[c]	✓	✓	✓	✓	✓	✓
Department FE		✓	✓		✓	✓
SE Department-level	✓	✓	✓	✓	✓	✓

Notes: Standard errors in parentheses are clustered at the department level, with the following significance-levels: *** 1%; ** 5%; and * 10%, that refer to two-sided t-test. [a] Direct capture indicator is a variable that averages forms of capture indicators at the politician level, classified as either direct or indirect. Direct capture index ranges from 0 to 6, with 6 the highest degree of capture. See Section 3 for more details on both outcomes. The outcomes are measured in standardized terms. [b] Politician-level covariates include age, university education, if politician changed party from last election (2015), enrollment to a party different from the President's party/coalition, a dummy for incumbency, and a dummy for incumbency and campaign financing. [c] Commune-level covariates include turnout and winning margin in 2015, executed fiscal expenses in 2013, and population in 2015. [d] Electoral Reform=1 if Laakso-Taagepera Index>2.5 in 2015, 0 otherwise.

Appendix B. Further Information on Sampling and the Sensitivity of Survey Questions

B.1. Further Information on Sampling and the Sensitivity of Survey Questions

The evidence presented in the main text suggests a high level of business participation in elections. However, the measured proportion of politicians that are affiliated to firms might suffer from social desirability bias, as they might not answer sensitive questions truthfully. Given the complexity of measuring such outcomes, we further verified our data through a list experiment.

As noted by Blair and Imai (2012) among others, this methodology protects respondents' confidentiality allowing them to reveal sensitive pieces of information. In a list experiment, we compare two groups, a treatment and a control group. The control group is asked to report a number of non-sensitive items called a short list, while the treatment group is asked to report the number on that same short list plus an additional sensitive item. The average response for each group are estimated and differenced out. The difference in means represents the proportion of the population for whom the sensitive item applies.

Our list experiment question to measure politicians' affiliation to business interests was the following:

> *How many of the following **5** individuals or groups do you consider yourself politically affiliated with? Please indicate HOW MANY in total, I don't want to know which ones, only how many of them. [ENUMERATOR: READ CHOICES AND SHOW THEM ON A PIECE OF PAPER]*

The list of answers that the control groups received was:

- `The Mayor of this commune`
- `A member of the communal council`
- `The Prefect of this department`
- `Member of Parliament`
- `The President/President's political party`

The list that the treatment group received included the following sensitive item (in the sixth position of the list):

- `National or local businessman/firm/business group`

In order to separate respondents into the treatment and control group we used their birthday months. Those born in January, March, May, July, September and November were assigned to the control group, while those born in February, April, June, August, October and December made the treatment group.

Table B-1 shows the balance between the treatment and control group of the list experiment across a wide range of covariates on politician characteristics. Out of 14 covariates, statistically significant differences exist in 3 of them. Table B-2 shows the results of the list experiment by running a t-test comparing the treatment and control means on politicians affiliation to corporations. The difference shows a statistically significant dependence of 64.4%. In other words, more than half of politicians and political brokers in Benin are affiliated with either local or national business interests. The

TABLE B-1. List Experiment Balance Table: politicians' affiliations with firms

	Mean Control	Mean Treatment	Diff	Diff. S.E.	p-value
Current position: Municipal Council Member	0.421	0.368	0.053	0.072	0.464
Current position: Other	0.428	0.485	-0.058	0.073	0.432
Age	48.290	44.059	4.231	1.505	0.005
Sex	1.952	1.971	-0.019	0.030	0.526
Years living in region	39.331	36.132	3.199	2.441	0.191
Highest Education: Elementary or College	0.359	0.221	0.138	0.068	0.043
Highest Education: University (1st cycle, 2nd or Graduate)	0.614	0.779	-0.166	0.069	0.017
Paty switch: different party from last election	0.539	0.647	-0.108	0.134	0.421
First time runner	0.255	0.294	-0.039	0.065	0.552
Hold political position in the past	0.779	0.735	0.044	0.063	0.482
Hold private position in the past	0.352	0.441	-0.089	0.071	0.212
Opposition party (not part of President's Party/Coalition)	0.407	0.382	0.025	0.072	0.735
Incumbent	0.145	0.118	0.027	0.051	0.592
Corporate financing (Mill CFA)	53.527	57.248	-3.721	20.040	0.853

Notes: Table B-1 reports the difference in means from a two-sided t-test comparing list experiment treated and control politicians. Treatment assignment was selected by birthday month.

TABLE B-2. List Experiment: politicians' affiliations with firms

	Mean Control	Mean Treatment	Diff	Diff. S.E.	p-value
All 213 respondents running for mayor/MP:					
Affiliation to firm (list experiment)	3.621	4.265	-0.644	0.195	0.001
117 respondents running for mayor in 2020:					
Affiliation to firm (list experiment)	3.576	4.406	-0.830	0.275	0.003
96 respondents running for MP in 2019:					
Affiliation to firm (list experiment)	3.683	4.139	-0.456	0.281	0.109

Notes: Table B-1 reports the difference in means from a two-sided t-test comparing list experiment treated and control politicians. Treatment assignment was selected by birthday month.

proportion is higher for politicians running for local positions (83%). Those running for MP do not show a significant difference, however. We conjecture that business interference might be higher at lower administrative levels due to the lack of state monitoring.

B.2. Additional Cross-Validation

To further cross-validate our dataset, we test the relationship between political uncertainty and politicians' spending preferences and electoral strategies to win votes. We focus on identifying how transfers to citizens, firms, and public goods, as well as vote buying attempts are affected by different degrees of electoral competition. We then compare our findings with these outcomes to established results in the literature, including those for Benin. Following Cruz (2018) and Cruz et al. (2019), politicians were given a picture worksheet with a list of ten options that they could allocate a hypothetical budget. The options were: (1) public health; (2) public education; (3) cash or transfers to employment or household accidents; (4) water and sanitation infrastructure; (5) road construction and renovation; (6) construction of municipal facilities (basketball court, multipurpose rooms, etc.); (7) business loans and actions to develop the private sector; (8) agricultural aid; (9) defense and security; and (10) events and festivals. Enumerators informed them of the amount of their local

development fund and gave them 20 tokens, with each token representing 5% of their available budget. Respondents were then asked to allocate their tokens freely, according to their own preferences. We use their answers to compare how much they planned to spend on citizen-specific goods relative to firm-specific ones by aggregating the answers into four measures of preferences: the first over citizens non-conditional transfers (options 3 and 10), the second over visible public goods (options 1, 2, 5, 6, 8 and 9), the third non-visible public goods (option 4) and, lastly, transfers to firms (option 7). We also rely on additional survey questions on vote buying attempts by respondents.

The empirical evidence on clientelism in Benin has pointed out that regional and incumbent candidates benefit more from clientelistic appeals than challengers. This occurs at the expense of public good provision Wantchekon (2003). One mechanism consistent with this is the increased availability of information to incumbents (Wantchekon, 2007). However, this channel is not as effective for the opposition. As Vicente and Wantchekon (2009) conclude in their assessment of multiple field experiments in West Africa, "while clientelism works particularly well for incumbents, vote buying seems to be more effective for challengers", possibly due to incumbents' disproportionate control of public resources.[56] According to this evidence, we should expect that as electoral uncertainty decreases (favoring the incumbent), transfers from politicians to voters should increase while vote buying attempts decrease. Moreover, public good provision should decrease.

Table B-3 presents the results discussed in the text. We find the expected negative effect on visible and non-visible public goods including water and sewage systems.

TABLE B-3. Effect of Electoral Reform on politicians' choices of various forms of transfers and expenses

Dependent variable:	Transfers from politicians to voters	Vote buying attempt	Public goods[a]	Non-visible Public goods[a]	Transfers from politicians to firms
	(1)	(2)	(3)	(4)	(5)
Electoral Reform[d] (decrease in uncertainty)	0.0125	0.0514	-0.1247	-0.1043	-0.0279
	(0.1605)	(0.1668)	(0.2883)	(0.1209)	(0.0486)
Observations	112	112	112	112	112
R-squared	0.206	0.434	0.233	0.325	0.308
Politician controls[b]	✓	✓	✓	✓	✓
Commune controls[c]	✓	✓	✓	✓	✓
Department FE	✓	✓	✓	✓	✓
SE Commune-level	✓	✓	✓	✓	✓

Notes: Standard errors in parentheses are clustered at the department level, with the following significance-levels: *** 1%; ** 5%; and * 10%, that refer to two-sided t-test. [a] Non-visible public goods include water and sewage infrastructure and maintenance projects. [b] Politician-level covariates include age, university education, if politician changed party from last election (2015), enrollment to an opposition different from the President's party/coalition and a dummy for incumbency. [c] Commune-level covariates include turnout in 2015, executed fiscal expenses in 2013, and effective number of parties in 2015. [d] Electoral Reform=1 if Laakso-Taagepera Index>2.5 in 2015, 0 otherwise.

[56] Similar results are found by Vicente (2014) in São Tomé and Príncipe.

Appendix C. Additional Theory

In this section, we provide the proof of Lemma 5.2 (Section C.1) and present the extensions to the main model - the microfoundation for τ using bureaucrat effort (Section C.2), the case when the reelection probability is endogenous (Section C.3) and the microfoundation for the market structure discussed in the baseline model (Section C.5). We also prove the results on the identification of the model with endogenous electoral certainty (Section C.4).

C.1. Proof of Lemma 5.2

Lemma 5.2. We note from equation (5.5) that μ^* does not vary with p. This is because distortions affect all outcomes with the same probability $(p+(1-p)\tau)$ for any p. However, equation (5.2) shows that it affects $w(\mu^*, \tau^*, p)$ directly. Taking derivatives of $w(\mu^*)$ in (5.2) and using that $\frac{d\mu^*}{dp} = 0$ by (5.5):

$$\frac{dw^*}{dp} = \frac{\partial w}{\partial p} + \frac{\partial w}{\partial \tau^*}\frac{\partial \tau^*}{\partial p} \tag{C.1}$$

Now, we derive each term in this expression. First, the direct effect:

$$\begin{aligned} \frac{\partial w^*}{\partial p} &= -(1-\tau^*)\gamma S(\mu^*) + (1-\tau^*)\gamma S(0) \\ &= -(1-\tau^*)\gamma(S(\mu^*) - S(0))) \\ &> 0, for\ \mu^* > 0. \end{aligned} \tag{C.2}$$

Now, the two terms in the indirect effect are given by:

$$\begin{aligned} \frac{\partial w^*}{\partial \tau^*} &= -(1-p)\gamma(S(\mu^*) - S(0)) > 0, for\ \mu^* > 0 \\ \frac{\partial \tau^*}{\partial p} &= \frac{(\pi_i(0) + \gamma S(0)) - (\pi_i(\mu^*) + \gamma S(\mu^*))}{h''(\tau^*)} < 0, for\ \mu^* > 0 \end{aligned} \tag{C.3}$$

For the direct term to dominate we need that:

$$(1-p)\left((\pi_i(\mu^*) + \gamma S(\mu^*)) - (\pi_i(0) + \gamma S(0))\right) \leq h''(\tau^*)(1-\tau^*)$$

or,

$$\frac{(1-p)\left((\pi_i(\mu^*) + \gamma S(\mu^*)) - (\pi_i(0) + \gamma S(0))\right)}{(1-\tau^*)} \leq h''(\tau^*),$$

which holds when electoral competition is sufficiently weak ($p \to 1$) or when $h(\cdot)$ is sufficiently convex (i.e. $h''(\cdot)$ sufficiently large). □

C.2. A simple microfoundation for τ based on bureaucrat effort

Let us consider a subgame where there is a new agent - (the representative) bureaucrat. This bureaucrat is risk averse, with utility $u(w, \theta)$, with $u(\cdot)$ strictly increasing and strictly concave in w and decreasing in θ - a parameter that denotes the amount of "cronyism".

There are two outcomes: the distortion μ^* gets implemented with probability τ, and does not get implemented with probability $1-\tau$. This bureaucrat chooses this probability, or effort, $\tau \in [0,1]$, at a cost $h_b(\tau)$ which is strictly increasing and convex. As a result, with probability τ the firm gets its net of payments distortions $\pi_i(\mu) + \gamma S(\mu)$. With probability $(1-\tau)$, it does not, and receives $\pi_i(0) + \gamma S(0)$. We assume that bureaucrat effort is observable to the firm, so the firm can offer contingent wages $w_{b,1}$ in case of successful implementation of μ, and $w_{b,0}$ otherwise.[57] Then, the firm's ex-ante problem to incentivize the bureaucrat (in the subgame which occurs with probability $1-p$) is given by:

$$\max_{\tau,\mu} \quad \tau(\pi_i(\mu) + \gamma S(\mu) - w_{b,1}) + (1-\tau)(\pi_i(0) + \gamma S(0) - w_{b,0}) \tag{C.4}$$

$$s.t. \quad \tau u(w_{b,1}, \theta) + (1-\tau)u(w_{b,0}, \theta) - h_b(\tau) \geq 0, \tag{C.5}$$

We consider interior solutions (i.e. the firms expected payoff is higher than $w(\mu)$). Restriction (C.5) holds as an equality. In this set-up, the optimal contract involves a fixed payment $w_b^* = w_{b,0} = w_{b,1}$ due to risk-aversion by the agent and risk-neutrality by the principal. We can then rewrite (C.5) as $u(w_b^*) = h_b(\tau)$, which implies that:

$$\begin{aligned} w_b^* &= u^{-1}(h_b(\tau), \theta) \\ &\equiv h(\tau, \theta). \end{aligned}$$

w_b^* is increasing and convex in τ, so our newly defined function $h(\tau)$ has the same properties as the $h(\tau)$ in the original problem (5.1). Plugging this, as well as $w_b^* = w_{b,0} = w_{b,1}$ into (C.4) yields an objective function in τ that is given by:

$$\max_{\tau,\mu} \quad \tau(\pi_i(\mu) + \gamma S(\mu)) + (1-\tau)(\pi_i(0) + \gamma S(0)) - h(\tau, \theta) \tag{C.6}$$

Clearly, this is the same objective function in τ as the one that was solved in the main text, although it has one additional feature. The amount of cronyism, θ, is implicitly present in this function. We can then compare how equilibrium market structure changes as a function of the bureaucrat's cronyism, θ. It is straightforward that

[57] In practice, firms can observe whether steps towards the implementation of legislation are being taken. We discuss this assumption in more detail in Section 6. Finally, note the difference between the timing of the two different types of compensations: while the firm must compensate the politician ex-ante, without knowing whether they are re-elected, it only has to compensate the bureaucrat once (s)he knows whether the incumbent was replaced. From the firm's point of view in period 1's, both re-election (through p) and direct control (through τ) are uncertain. When compensating the bureaucrat, only the latter is.

$$\frac{\partial h(\tau,\theta)}{\partial \theta} < 0, \tag{C.7}$$

so it is less costly to extract effort for distortions from a crony bureaucrat.

C.3. The Case with Endogenous Reelection

As outlined in the main text, in this extension we assume that $p(\mu)$ is increasing and differentiable in μ. For tractability, we further assume that $h(\cdot)$ is sufficiently convex, so that the objective function is concave. Below, we discuss the conditions for that to hold.

Our key maintained assumption is that $w(\mu)$ cannot affect p directly ($p(\mu)$ is a function of μ, and not $w(\mu)$). This is for tractability. If $p(\cdot)$ was explicitly a function of $w(\mu)$, then equation (5.2) is not invertible in $w(\cdot)$ and the problem becomes unwieldy. This assumption can be interpreted as an exclusion restriction, and one which we believe is reasonable in our applied setting. In this extension, distortions μ change electoral uncertainty p, which then changes transfers to politicians $w(\cdot)$ by affecting the probability that (s)he is elected. Our restriction restricts "self-financing" by politicians: an increase in $w(\cdot)$ cannot be used to increase $p(\cdot)$. One can interpret this as the probability of being elected changes a legislator's rents, but such personal rents are "take home", not affecting the probability of winning. This separation of private and public effects of state capture is part of other well-established arguments in the literature (e.g. Mattozzi and Merlo 2008; Blanes i Vidal et al. 2012 on revolving doors and private careers), it is convenient for the mathematical reasons described above and it also appears to hold in our electoral setting. From qualitative evidence in the field, there appears to be little "self-financing". Furthermore, most races are financed by only one firm - see Section 7.1 for details. However, this assumption would seem inappropriate for elections occurring in large markets, where both profits and the amounts of funds/campaign financing are sizable. In such elections, the personal benefits received by a candidate receives may be large enough to be reinvested and meaningfully impact reelection, so that its strategic effects should be accounted for.

In our new environment, we can rewrite problem (5.1) as:

$$\max_{\tau,\mu} \quad (p(\mu)+(1-p(\mu))\tau)\pi_i(\mu)+(1-p(\mu))(1-\tau)\pi_i(0)-w(\mu)-h(\tau) \tag{C.8}$$

$$s.t. \quad w(\mu)=\bar{u}-(p(\mu)+(1-p(\mu))\tau)\gamma S(\mu)-(1-p(\mu))(1-\tau)\gamma S(0),, \tag{C.9}$$

which becomes:

$$\max_{\tau,\mu}(p(\mu)+(1-p(\mu))\tau)(\pi_i(\mu)+\gamma S(\mu))+(1-p(\mu))(1-\tau)(\pi_i(0)+\gamma S(0))-\bar{u}-h(\tau). \tag{C.10}$$

Lemma 5.4 states that: $\mu^*_{exo} \leq \mu^*_{end}$. We prove it below.

Proof of Lemma 5.4. For convenience, let us recall that the first order condition of (C.10) in τ is given by:

$$(1-p(\mu^*_{end}))(\pi_i(\mu^*_{end})+\gamma S(\mu^*_{end})-(\pi_i(0)+\gamma S(0)))=h'(\tau^*_{end}). \tag{C.11}$$

The first order condition of (C.10) in μ is given by:

$$\begin{aligned}&(p(\mu^*_{end}) + (1 - p(\mu^*_{end}))\tau^*)(\nabla_\mu \pi_i(\mu^*_{end}) + \gamma \nabla_\mu S(\mu^*_{end})) \\ &+p'(\mu^*_{end})(1-\tau^*)(\pi_i(\mu^*_{end}) + \gamma S(\mu^*_{end}) - (\pi_i(0) + \gamma S(0))) = 0\end{aligned} \tag{C.12}$$

With h'' sufficiently negative (see the conditions below), we know that the solution is fully characterized by the first order conditions in equations (C.11)-(C.12) above. The second term in (C.12) is positive, which implies that:

$$(p(\mu^*_{end}) + (1 - p(\mu^*_{end}))\tau^*)(\nabla_\mu \pi_i(\mu^*_{end}) + \gamma \nabla_\mu S(\mu^*_{end})) < 0$$

Since $(p(\mu^*_{end}) + (1 - p(\mu^*_{end}))\tau^*) > 0$, then it must be the case that:

$$\nabla_\mu \pi_i(\mu^*_{end}) + \gamma \nabla_\mu S(\mu^*_{end}) < 0$$

From (5.5), we have that $\nabla_\mu \pi_i(\mu^*_{exo}) + \gamma \nabla_\mu S(\mu^*_{exo}) = 0$, implying that:

$$\nabla_\mu \left(\pi_i(\mu^*_{end}) + \gamma S(\mu^*_{end})\right) < \nabla_\mu \left(\pi_i(\mu^*_{exo}) + \gamma \nabla_\mu S(\mu^*_{exo})\right).$$

Since the function $\pi_i(\mu) + \gamma S(\mu)$ is concave, we must have that $\mu^*_{end} \geq \mu^*_{exo}$. □

Sufficiency of First Order Conditions for the solution to the Endogenous p model. We now check that the two First Order Conditions above are sufficient to characterize the optimal $\mu^*_{end}, \tau^*_{end}$. Let $d(\tau, \mu)$ denote the objective function in (C.10). The Hessian matrix for this problem is given by:

$$\mathcal{H} = \begin{pmatrix} \frac{\partial^2 d}{\partial \tau^2} & \frac{\partial^2 d}{\partial \tau \partial \mu} \\ \frac{\partial^2 d}{\partial \tau \partial \mu} & \frac{\partial^2 d}{\partial \mu^2} \end{pmatrix},$$

where

$$\begin{aligned}\frac{\partial^2 d}{\partial \tau^2} &= -h''(\tau) \\ \frac{\partial^2 d}{\partial \tau \partial \mu} &= (1 - p(\mu))(\nabla_\mu(\pi(\mu) + \gamma S(\mu))) - p'(\mu)(\pi(\mu) + \gamma S(\mu) - \pi(0) - \gamma S(0)) \\ \frac{\partial^2 d}{\partial \mu^2} &= (p(\mu) + (1 - p(\mu))\tau)(\nabla^2_\mu(\pi(\mu) + \gamma S(\mu))) \\ &\quad +2p'(\mu)(1-\tau)(\nabla_\mu(\pi(\mu) + \gamma S(\mu)) + p''(\mu)(1-\tau)(\pi(\mu) + \gamma S(\mu) - \pi(0) - \gamma S(0))\end{aligned}$$

While one can find general conditions for $\mathcal{H}$ to be negative semi-definite at μ^*, τ^*, we do not pursue this because this is an (illustrative) extension of the baseline model (where this result already holds), and the excessive algebra due to the nonlinearities in $p(\mu)$ make it very tedious without great insight to the reader. Instead, we note that $\frac{\partial^2 d}{\partial \tau^2} = -h''(\tau) < 0$ for every τ, μ since $h(\cdot)$ is strictly convex by assumption. By Sylvester's criterion, it is then sufficient to check that: $\frac{\partial^2 d}{\partial \tau^2}\frac{\partial^2 d}{\partial \mu^2} - \left(\frac{\partial^2 d}{\partial \tau \partial \mu}\right)^2 > 0$. If $p'' < 0$, only the second term in $\partial^2 d/\partial \mu^2$ is positive and will be dominated by the other two terms if $p'(\cdot)$ is small or if $\nabla^2_\mu(\pi(\mu) + \gamma S(\mu))$ is sufficiently negative. The result then holds if, for instance, $h''(\tau^*)\nabla^2_\mu(\pi(\mu^*) + \gamma S(\mu^*))$ is sufficiently negative. □

C.4. Identification in the Model with Endogenous $p(\cdot)$

In the main text, we considered the structural identification and estimation of our baseline model. Here, we discuss identification of the extension considered in Section 5.3.2.

Consider the analogous identification argument to the one presented in the main text. We drop the indices for convenience. From the first order condition for μ, given in equation (C.12):

$$\nabla_\mu(\pi_i(\mu^*_{end}) + \gamma S(\mu^*_{end})) = -\frac{p'(\mu^*_{end})(1-\tau^*)}{(p(\mu^*_{end}) + (1-p(\mu^*_{end}))\tau^*)}(\pi_i(\mu^*_{end}) + \gamma S(\mu^*_{end}) - (\pi_i(0) + \gamma S(0))).$$

From a second-order Taylor expansion of $\pi_i(0) + \gamma S(0)$ around μ^*_{end} we have that:

$$\begin{aligned}(\pi + \gamma S)(0) - (\pi + \gamma S)(\mu^*_{end}) &= -\nabla_\mu(\pi(\mu^*_{end}) + \gamma S(\mu^*_{end}))\mu^*_{end} + \nabla^2_\mu(\pi(\bar\mu) + \gamma S(\bar\mu))\mu^{*,2}_{end} \\ = \frac{p'(\mu^*_{end})(1-\tau^*)\mu^*_{end}}{(p(\mu^*_{end}) + (1-p(\mu^*_{end}))\tau^*)}&(\pi_i(\mu^*_{end}) + \gamma S(\mu^*_{end}) - (\pi_i(0) + \gamma S(0))) + \nabla^2_\mu(\pi(\bar\mu) + \gamma S(\bar\mu))\mu^{*,2}.\end{aligned}$$

This can be rewritten as:

$$((\pi(\mu^*_{end}) + \gamma S(\mu^*_{end})) - (\pi(0) + \gamma S(0)))\left(1 + \frac{p'(\mu^*_{end})(1-\tau^*)\mu^*_{end}}{(p(\mu^*_{end}) + (1-p(\mu^*_{end}))\tau^*)}\right) = -\nabla^2_\mu(\pi(\bar\mu) + \gamma S(\bar\mu))\mu^{*,2}.$$

Plugging in the first order condition in τ in the left hand side above, and using Assumption ID(ii):

$$\begin{aligned}\frac{\tau^*_{end}}{1-p(\mu^*_{end})} &= (\pi(\mu^*_{end}) + \gamma S(\mu^*_{end})) - (\pi(0) + \gamma S(0)) \\ &= \frac{1}{1 + \left(\frac{p'(\mu^*_{end})(1-\tau^*)\mu^*_{end}}{(p(\mu^*_{end}) + (1-p(\mu^*_{end}))\tau^*)}\right)}\left(-\nabla^2_\mu(\pi(\bar\mu) + \gamma S(\bar\mu))\mu^{*,2}_{end}\right).\end{aligned} \tag{C.13}$$

Equation (C.13) is very similar to (7.3). The difference is the term $\frac{1}{1+\left(\frac{p'(\mu^*_{end})(1-\tau^*)\mu^*_{end}}{(p(\mu^*_{end}) + (1-p(\mu^*_{end}))\tau^*)}\right)}$ multiplying the right hand side. If this term did not have τ^*, our extension would be simply a nonlinear transformation of the baseline estimating equation. Unfortunately, though, the expression in (C.13) does include τ^*, the dependent outcome. Estimating it based on an empirical analogue would be a type of "forbidden regression".

While we cannot obtain an immediate point identification result for the extended model, let us consider a set-identification approach. Note that the multiplying term is increasing in τ^*. Hence, our outcome can be bounded by:

$$\frac{1}{1 + \left(\frac{p'(\mu^*_{end})\mu^*_{end}}{p(\mu^*_{end})}\right)}\nabla^2_\mu\left(\pi(\mu^*_{end}) + \gamma S(\mu^*_{end})\right)\mu^{*,2}_{end} \leq \frac{\tau^*_{end}}{1-p(\mu^*_{end})} \leq \nabla^2_\mu\left(\pi(\mu^*_{end}) + \gamma S(\mu^*_{end})\right)\mu^{*,2}_{end},$$

where the left hand side is the lower bound obtained by setting $\tau^* = 0$ in the multiplier term, and the right hand side is the upper bound by setting $\tau^* = 1$.

It is straightforward that when $p'(\mu^*_{end})\mu^*_{end}/p(\mu^*_{end})$ is small, the bounds will be very tight and approximately equal to the set-up in our baseline specification. Using Assumption ID(i) and log-linearizing (5.4) would yield the analogous equation to (7.4). Naturally, the parameters for the endogenous p specification would differ from those in the exogenous case (α, β) because $\mu^*_{end} \geq \mu^*_{exo}$ by Lemma 5.4, although identified by the same arguments. However, if $p'(\mu^*_{end})\mu^*_{end}/p(\mu^*_{end})$ is small

and the true model has endogenous $p(\cdot)$, we do not need to re-estimate our model and we can simply reinterpret our estimates from Section 8 as the results from the endogenous case.

C.5. A Microfoundation of Market Structure and Additional Proofs

In this section, we develop a model of the market in which firms compete. Given a parametrization for consumer demand, we are then able to find closed form solutions for profits and consumer surplus that can be used in the main model.

We consider the effects of the politically induced distortions on a particular market after the election. We focus on the case of $\mu^* > 0$ (realization in which the incumbent stays in power, or that contract was upheld), as the $\mu = 0$ case is analogous. We have n firms, who differ in their marginal costs, c_i, and who can supply a homogeneous product. They compete in quantities à la Cournot. The following problem is very standard. However, we first characterize the general solution before parametrizing for a microfoundation of our period 1 problem. Given μ, firm j solves:

$$\max_{q_j}(P(q_1 + ... + q_n) - c_j)q_j \tag{C.14}$$

In an interior solution, we have that:

$$\frac{P - c_j}{P} = -\frac{s_j}{\varepsilon}, \tag{C.15}$$

where $\varepsilon = \frac{\partial Q}{\partial P}\frac{P}{Q}$ is the (market level) price elasticity, and $s_j = \frac{q_j}{\sum_k q_k}$ is j's market share.

It is convenient to parametrize $P(\cdot)$ so we can find closed form results for consumer surplus $S(\mu)$ and for profits $\pi_i(\mu)$. It can then be proved that this case satisfies the conditions required in the first stage of the game. Let demand be given by $Q = q_1 + ... + q_n = ae^{-P/b}$, which is a negative exponential demand. We assume b (price at which demand is elastic) is large enough, in a sense made precise in equation (C.24). n denotes the (endogenous) number of firms that enter the market. It follows that inverse demand is given by $P = bln\left(\frac{a}{q_1+...+q_n}\right)$. The solution from first order conditions that:

$$(P - c_i) = b\frac{q_i}{Q} \tag{C.16}$$

$$s_i = \frac{q_i}{Q} = \frac{P - c_i}{b} \tag{C.17}$$

$$= \frac{1}{n} + \frac{\bar{c}(\mu^*) - c_i}{b} \tag{C.18}$$

so that market shares are a fixed proportion of the mark-up. It is also easy to see that elasticity is given by $\varepsilon = -\frac{P}{b}$. We can then find expressions for Consumer Surplus as follows:

$$Q^*(\mu^*) = ae^{-\left(\frac{1}{n} + \frac{\bar{c}(\mu^*)}{b}\right)} \tag{C.19}$$

$$S(\mu^*) = bQ^*(\mu^*). \tag{C.20}$$

We now prove the properties of $S(\mu), \pi_i(\mu)$ that were used in the baseline model. We first show how we derive equation (C.20) and an expression for HHI:

$$\begin{aligned} HHI &= -\frac{1}{\varepsilon}\sum_{k=1}^{n} s_k^2 \\ &= \frac{b}{P}\sum_{k=1}^{n}\left(\frac{P-c_k}{b}\right)^2 \\ &= \frac{b}{\frac{b}{n}+\bar{c}}\sum_{k=1}^{n}\left(\frac{1}{n}+\frac{\bar{c}(\mu^*)-c_k(\mu^*)}{b}\right)^2. \end{aligned} \tag{C.21}$$

$$\begin{aligned} S(\mu^*) &= \int_0^{Q^*} P(Q)dQ - PQ^* \\ &= \int_0^{Q^*} bln\left(\frac{a}{Q}\right)dQ - PQ^* \\ &= b\left[Qln\left(\frac{a}{Q}\right)+Q\right]_0^{Q^*} - PQ^* \\ &= Q^*\underbrace{b\left(\frac{a}{Q}\right)}_{=P} + bQ^* - PQ^* \\ &= bQ^*(\mu^*). \end{aligned} \tag{C.22}$$

Lemma C.1. *Consumer surplus is decreasing in μ, profits are increasing in μ, both functions are differentiable and $\pi_i(\mu)+\gamma S(\mu)$ is concave in μ for b, γ large enough.*

Proof of Lemma C.1. Fix n. For consumer surplus $S(\mu)$ to be differentiable and concave in μ, it is sufficient for $Q = ae^{-\left(\frac{1}{n}+\frac{\bar{c}}{b}\right)}$ to be differentiable and concave in μ due to (C.19). With n fixed, and $\bar{c}(\mu^*) = \frac{1}{n}\sum_{j=1}^{n} c_j(\mu)$, with c_j strictly convex in μ, it is immediate that $S(\mu)$ is differentiable. Furthermore, it is decreasing and concave. Indeed:

$$\frac{\partial Q^*}{\partial \mu} = -\frac{Q^*}{b}\frac{d\bar{c}}{d\mu} < 0 \tag{C.23}$$

$$\frac{\partial^2 Q^*}{\partial \mu^2} = -\frac{Q^*}{b}\frac{d^2\bar{c}}{d\mu^2} + \frac{Q^*}{b^2}\left(\frac{d\bar{c}}{d\mu}\right)^2 < 0, \tag{C.24}$$

with the second inequality as long as $\frac{d^2\bar{c}(\mu^*)}{d\mu^2} > \frac{1}{b}\left(\frac{d\bar{c}(\mu^*)}{d\mu}\right)^2$, which holds if b is large enough.

Now, let us look at profit. Profit for firm i (the connected firm, for whom we need π_i increasing and concave) is given by:

$$\begin{aligned} \pi_i &= (P-c_i)q_i = \left(\frac{b}{n}+\bar{c}-c_i\right)\underbrace{\left(\frac{1}{n}+\frac{\bar{c}-c_i}{b}\right)Q^*}_{q_i=s_iQ^*} \\ &= bQ^*\left(\frac{1}{n}+\frac{\bar{c}(\mu)-c_i}{b}\right)^2. \end{aligned} \tag{C.25}$$

It is clearly differentiable in μ. It is also increasing for b large enough as:

$$\begin{aligned}
\frac{\partial \pi_i}{\partial \mu} &= b\frac{\partial Q^*}{\partial \mu}\left(\frac{1}{n}+\frac{\bar{c}(\mu)-c_i}{b}\right)^2+\frac{2bQ^*}{b}\left(\frac{1}{n}+\frac{\bar{c}(\mu)-c_i}{b}\right)\frac{d(\bar{c}(\mu)-c_i)}{d\mu} \\
&= b\left(\frac{-Q^*}{b}\frac{d\bar{c}}{d\mu}\right)\left(\frac{1}{n}+\frac{\bar{c}(\mu)-c_i}{b}\right)^2+\frac{2bQ^*}{b}\left(\frac{1}{n}+\frac{\bar{c}(\mu)-c_i}{b}\right)\frac{d(\bar{c}(\mu)-c_i)}{d\mu} \qquad \text{(C.26)} \\
&> 0.
\end{aligned}$$

The second line follows from (C.23) and the last line follows from:

$$\begin{aligned}
\left(Q^*\frac{d\bar{c}}{d\mu}\right)\left(\frac{1}{n}+\frac{\bar{c}(\mu)-c_i}{b}\right)^2 &< 2Q^*\left(\frac{1}{n}+\frac{\bar{c}(\mu)-c_i}{b}\right)\frac{d(\bar{c}(\mu)-c_i)}{d\mu} \\
\Leftrightarrow \left(\frac{1}{n}+\frac{\bar{c}(\mu)-c_i}{b}\right) &< 2,
\end{aligned}$$

which holds if b is large enough. Concavity of $\pi_i(\mu)+\gamma S(\mu)$ can follow for a large enough γ from (C.24). □

Appendix D. Additional Tables

TABLE D-1. Politicians' characteristics, descriptive statistics of full sample

	Mean	SD	Min	Max	N
Politician sociodemographics					
Title: politician (=1) or broker (=0)	0.82	0.38	0	1	311
Current position: Deputy	0.05	0.23	0	1	311
Current position: Minister	0.00	0.06	0	1	311
Current position: Mayor	0.05	0.22	0	1	311
Current position: Municipal Council Member	0.32	0.47	0	1	311
Current position: Cabinet Director	0.01	0.11	0	1	311
Current position: Other	0.55	0.50	0	1	311
Age	47.66	11.02	24	73	311
Years living in region	37.61	17.23	0	73	311
No education	0.02	0.13	0	1	311
Elementary	0.03	0.18	0	1	311
College 1st cycle	0.12	0.32	0	1	311
College 2nd cycle	0.14	0.35	0	1	311
University 1st cycle	0.16	0.37	0	1	311
University 2nd cycle	0.29	0.45	0	1	311
Graduate	0.24	0.43	0	1	311
Politicians political participation					
Member of Political Party	0.97	0.17	0	1	311
Participated in past elections as candidate	0.72	0.45	0	1	311
Participated in past Commune-level Elections	0.87	0.33	0	1	223
Participated in past Legislative-level Elections	0.37	0.48	0	1	223
Participated in past Presidential-level Elections	0.01	0.12	0	1	223
Num. Participations in Commune Elections	1.48	0.85	0	3	223
Num. Participations Legislative Elections	0.59	0.94	0	5	223
Paty switch: different party from last election	0.52	0.88	0	2	302
Paty switch: same party as last election, but other in the past	0.72	0.96	0	2	223
Main change party reason: Ideology	0.49	0.50	0	1	222
Main change party reason: Poor project definition	0.32	0.47	0	1	222
Main change party reason: Personal interest	0.50	0.50	0	1	222
Main change party reason: Opposition to movement	0.55	0.50	0	1	222
Main change party reason: Movement towards opposition	0.15	0.36	0	1	222
=1 if running for Commune Elections (2020); 0 for Legislative (2019)	0.55	0.50	0	1	213
First time runner	0.27	0.44	0	1	215
Hold political position in the past	0.76	0.43	0	1	311
Hold private position in the past	0.36	0.48	0	1	311
Incumbent Mayor	0.05	0.22	0	1	311
Incumbent Deputy	0.05	0.23	0	1	311

Note: This table describes the characteristics of the full sample of 311 respondents.

TABLE D-2. Comparison of communes included and excluded in our dataset

	Mean Excluded	Mean Included	Diff.	Diff. S.E.	p-value
Total number of lit pixels per commune (corrected, 2013)	1723.875	1838.462	-114.587	506.129	0.822
Average luminosity (not corrected, 2013)	5.460	7.848	-2.389	1.837	0.198
Average luminosity (corrected, 2013)	0.966	6.530	-5.563	4.544	0.225
Voter turnout, Mayor elections (2015)	0.641	0.604	0.037	0.021	0.083
Winning margin (first-second runner), Mayor elections (2015)	0.162	0.185	-0.024	0.046	0.603
Winning margin (second-third runner), Mayor elections (2015)	0.153	0.183	-0.030	0.034	0.378
Winning margin (third-second runner), Mayor elections (2015)	0.060	0.050	0.011	0.012	0.381
Number of parties (2015), Mayor elections (2015)	5.375	5.442	-0.067	0.588	0.909
Molinar Effective Number of Parties Index, Mayor elections (2015)	5.689	5.545	0.145	0.985	0.883
Parties Herfindahl-Hirschman Index, Mayor elections (2015)	0.370	0.387	-0.018	0.026	0.509
Winning margin (1st-2nd runner parties diff. num. council members, 2015)	0.376	0.399	-0.023	0.070	0.747
Population (GHS-2015)	100,225	153,357	-53,132	24,931	0.036
Planned Fiscal Expenditures (Mill CFA - 2013)	289	747	-458	427	0.287
Executed Fiscal Expenditures (Mill CFA - 2013)	186	525	-339	325	0.300
Planned Functionary Costs (Mill CFA - 2013))	276	747	-471	427	0.274
Executed Functionary Costs (Mill CFA - 2013)	173	420	-247	226	0.276
Planned Investment Income (Mill CFA - 2013)	571	801	-230	165	0.168
Executed Investment Income (Mill CFA - 2013)	354	384	-30	27	0.275
Planned Investment Expenditures (Mill CFA - 2013)	570	804	-234	165	0.161
Executed Investment Expenditures (Mill CFA - 2013)	296	417	-121	88	0.176

Note: This table reports the difference in means from a two-sided t-test, comparing the characteristics of the 52 communes included in our dataset relative to the 25 communes where data was not collected.

TABLE D-3. Effect of electoral competition on firms' choices of direct capture, wild bootstrap

Dependent variable: direct capture indicator[a]	Commune election				Legislative election	
	(1)	(2)	(3)	(4)	(5)	(6)
Winning margin (1st-2nd runner)	-0.1258	-0.4793	-0.4536		0.1197	0.1111
Wild CI:	[-0.244, -0.025]	[-0.876, -0.163]	[-0.782, -0.100]		[-0.116, 0.371]	[-0.1117, 0.350]
Winning margin (2nd-3rd runner)				0.0429		
Wild CI:				[-0.272, 0.345]		
Observations	112	112	112	94	96	95
R-squared	0.023	0.166	0.258	0.216	0.146	0.185
Politician Controls[b]			✓	✓		✓
Commune Controls[c]	✓	✓	✓	✓		
Department FE		✓	✓	✓	✓	✓
Cluster Department-level	✓	✓	✓	✓	✓	✓

Notes: Brackets show the lower and upper 95% confidence intervals using a wild bootstrap method (Cameron et al., 2008), with 1,000 replications to account for a small number of clusters. Standard errors are clustered at the department level. [a] The direct capture indicator is a variable that averages forms of capture indicators at the politician level, classified as either direct or indirect (see Section 3 for more details). The dependent and independent variables are standardized. [b] Politician-level covariates include age, university education, if politician changed party from last election (2015), enrollment to a party different from the President's party/coalition and a dummy for incumbency. [c] Commune-level covariates include turnout in 2015, executed fiscal expenses in 2013, effective number of parties and population in 2015.

TABLE D-4. Effect of the number of candidates on firms' choices of direct capture, differences in means test

	Mean Control	Mean Treatment	Diff	Diff. S.E.	p-value
Refund/Reimbursement	0.026	0.077	-0.051	0.029	0.076
Demand policies	0.419	0.479	-0.060	0.065	0.360
Change in political program	0.103	0.145	-0.043	0.043	0.323
Target public goods to specific sector	0.778	0.598	0.179	0.060	0.003
Nomination of candidate from firm to office	0.145	0.137	0.009	0.046	0.852
Demand Budget line	0.043	0.068	-0.026	0.030	0.394
Patronage	0.402	0.359	0.043	0.064	0.503
Bureaucratic recruitment control	0.162	0.214	-0.051	0.051	0.318
Direct Capture Indicator (respondent-level)	0.340	0.658	-0.318	0.052	0.000
Direct Capture Index (respondent-level)	2.995	4.333	-1.339	0.215	0.000

Note: This table reports the difference in means from a two-sided t-test between the firms' strategies used under the *status quo* (control) and the potential strategies firms' would utilize if the number of candidates increase in the next election (treatment). The unit of analysis are 117 politicians running for mayor in the 2020 elections.

TABLE D-5. Strategies to win votes

	Mean	SD	Min	Max	N
Politicians running for mayor in 2020:					
Mass Communication Policy and Agenda	0.95	0.22	0	1	117
Promise Political Appointment to Citizen	0.38	0.49	0	1	117
Vote Buying Attempt	0.50	0.50	0	1	117
Ethnic Strategy	0.44	0.50	0	1	117
Politicians running for MP in 2019:					
Mass Communication Policy and Agenda	0.90	0.31	0	1	96
Promise Political Appointment to Citizen	0.42	0.50	0	1	96
Vote Buying Attempt	0.53	0.50	0	1	96
Ethnic Strategy	0.40	0.49	0	1	96

Note: This table describes the strategies to win votes used by the subsample of 213 politicians who plan to contend in the legislative or commune-level elections of 2019 and 2020, respectively.

TABLE D-6. Sensitivity Analysis: firms' choices of direct capture

Panel A: Effect of electoral competition on firms' choices of direct capture

Dependent variable[a]:	Direct Capture Indicator	Direct Capture Index	Pooling-2 demands	Pooling-3 demands	Swap 1st-2nd demand	Swap 2nd-3th demand	Swap 3th-4th demand	Swap 4th-5th demand	Swap 5th-6th demand	Swap 6th-7th demand
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Winning margin (1st-2nd runner)	-0.4536*	-0.4696***	-0.3464**	-0.3917*	-0.4979***	-0.3106**	-0.5326***	-0.3953***	-0.5683***	-0.4261**
	(0.2093)	(0.1379)	(0.1207)	(0.2138)	(0.1596)	(0.1378)	(0.1330)	(0.1264)	(0.1728)	(0.1403)
Observations	112	112	112	112	112	112	112	112	112	112
R-squared	0.258	0.260	0.278	0.265	0.239	0.264	0.270	0.251	0.267	0.273
Politician Controls[b]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Commune Controls[c]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Department FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SE Department-level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Panel B: Effect of Electoral Reform on firms' choices of direct capture

Dependent variable[a]:	Direct Capture Indicator	Direct Capture Index	Pooling-2 demands	Pooling-3 demands	Swap 1st-2nd demand	Swap 2nd-3th demand	Swap 3th-4th demand	Swap 4th-5th demand	Swap 5th-6th demand	Swap 6th-7th demand
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Electoral Reform[d] (decrease in uncertainty)	-0.2611**	-0.2066**	-0.1854**	-0.2413*	-0.2119**	-0.2227**	-0.1657	-0.1784*	-0.2436**	-0.1786**
	(0.1179)	(0.0846)	(0.0779)	(0.1139)	(0.0956)	(0.0954)	(0.1116)	(0.0811)	(0.1072)	(0.0793)
Observations	112	112	112	112	112	112	112	112	112	112
R-squared	0.257	0.251	0.282	0.274	0.224	0.275	0.243	0.248	0.249	0.269
Politician controls[b]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Commune controls[c]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Department FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SE Department-level	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Standard errors in parentheses are clustered at the department level, with the following significance-levels: *** 1%; ** 5%; and * 10%, that refer to two-sided t-tests. [a] The Direct Capture results in column (1) are the same as Table 5 column (3). The Direct capture index in column (2) is the same as Table 5 column (6). In column (3) we pool items by pairs, following the order of the Direct Capture Index. In column (4) we pool the first three items together, and then the last four. From columns (5) to (10) we swap items following the order of the Direct Capture Index. [b] Politician-level covariates include age, university education, if politician changed party from last election (2015), enrollment to a party different from the President's party/coalition and a dummy for incumbency. [c] Commune-level covariates for Panel A include turnout in 2015, executed fiscal expenses in 2013, effective number of parties and population in 2015. For Panel B we remove effective number of parties and include winning margin in 2015. [d] Electoral Reform=1 if Laakso-Taagepera Index>2.5 in 2015, 0 otherwise.