

Essays on Political Accountability and Selection

JOSÉ ANTONIO CARRILLO-VIRAMONTES



University of
Nottingham

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University of Nottingham
UK

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To Miriam, Maria, and the memory of José Antonio

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Essays on Political Accountability and Selection

José Antonio Carrillo-Viramontes

Abstract

The aim of this thesis is to contribute to the political agency literature by analysing theoretically how media can enhance political accountability and selection. In this thesis, I identify and analyse two channels in which media can affect political accountability and selection. First, media spillovers can improve voters' imperfect information and promote politicians' discipline. Second, journalism can affect the distribution of candidates' quality across levels of government. The thesis is composed of three chapters.

In Chapter 1, I present a theoretical model that analyses how voters use information from media spillovers to discipline politicians, but the spillovers depend on the geographic localization of a jurisdiction. The yardstick competition model demonstrates that within isolated jurisdictions (without media spillovers) politicians are more likely to subtract private rents. Whereas in a jurisdiction connected with two neighbouring jurisdictions, politicians have a lower probability of engaging in rent extraction. Moreover, I also show that even incumbents in isolated jurisdictions have a lower probability of engaging in obtaining private rents due to positive spillovers from neighbouring jurisdictions via voters' incumbency advantage.

Chapter 2 theoretically analyses the effects of a journalist on the distribution of bad and good candidates across levels of government. Specifically, how bad (good) candidates self-select to local or national office anticipating the journalist's decision to investigate at local or national level. In the model, candidates' decisions are driven by the relative difference in the rewards for being the representative at a local or national office; and in the case of bad candidates also by the potential scandal cost of being exposed by the journalist.

The theoretical model demonstrates that increasing the scandal cost of being exposed in a journalist report, does not deter bad candidates from running nationally (when the reward ratio is large enough). Indeed, it only makes that both, bad and good candidates to be

distributed evenly across levels of government. Also, I found that when the reward ratio is on a specific range, increasing the scandal cost of being exposed in a journalist report creates only two opposite types of equilibria: one in which a bad candidate runs locally, whereas, in the other one, a good candidate runs locally. Moreover, I found a non-monotonic relationship between the probability of a bad candidate being elected at a local level and the reward ratio.

Chapter 3 provides a brief description and an overview of the political system in Mexico. In particular, it describes the economic and political consequences that a one-party hegemony has had on the political corruption and accountability in Mexico. As the evidence suggests, the characteristics of the Mexican political system along with the hegemony, high centralized public finances, and a lack of electoral punishment have increased Mexico's political corruption, and ultimately reduced political accountability.

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Introduction

The political agency literature deals with two main problems: accountability and selection. Regarding political accountability, a sanction or reward is needed to reduce inefficiencies such as rent seeking. As for political selection, the attraction of the most competent politicians is the main concern to have a better government performance.

The main mechanism that voters have to enhance political accountability and selection is elections. However, voters' imperfect information about the agents' actions and types might reduce the effectiveness of the mechanism. The aim of this thesis is to contribute to the political agency literature by analysing theoretically how media can enhance voters' imperfect information and, therefore political accountability and selection.

In particular, Chapter 1 analyses theoretically how voters use information from media spillovers to discipline politicians when the spillovers depend on the geographic localization of a jurisdiction. The yardstick competition model demonstrates that within isolated jurisdictions (without media spillovers) politicians are more likely to extract private rents. Whereas in a jurisdiction connected with two neighbouring jurisdictions, politicians have a lower probability of engaging in rent extraction. I also show that even incumbents in isolated jurisdictions have a lower probability of engaging in obtaining private rents due to positive spillovers from neighbouring jurisdictions via voters' incumbency advantage. In other words, yardstick competition creates positive spillovers (although small) even for those jurisdictions which are isolated (i.e., not exposed to yardstick competition).

Chapter 2 theoretically analyses the effects of a journalist on the distribution of bad and

good candidates across levels of government. Specifically, how bad (good) candidates self-select to local or national office anticipating the journalist's decision to investigate at local or national level. In the model, candidates' decisions are driven by the relative difference in the rewards for being the representative at a local or national office; and in the case of bad candidates also by the potential scandal cost of being exposed by the journalist.

The theoretical model demonstrates that increasing the scandal cost of being exposed in a journalist report, does not deter bad candidates from running nationally (when the reward ratio is large enough). Indeed, it only makes that both, bad and good candidates to be distributed evenly across levels of government. Also, I found that when the reward ratio is on a specific range, increasing the scandal cost of being exposed in a journalist report creates only two opposite types of equilibria: one in which a bad candidate runs locally, whereas, in the other one, a good candidate runs locally. Moreover, I found a non-monotonic relationship between the probability of a bad candidate being elected at a local level and the reward ratio.

Chapter 3 provides a brief description and an overview of the political system in Mexico. In particular, it describes the economic and political consequences that a one-party hegemony has had on the political corruption and accountability in Mexico. As the evidence suggests, the characteristics of the Mexican political system along with the hegemony, high centralized public finances, and a lack of electoral punishment have increased Mexico's political corruption, and ultimately reduced political accountability.

The structure of the thesis is as follows. The next section presents Chapter 1, which is titled "Information spillovers among jurisdictions to discipline politicians". Then, Chapter 2 is presented and the title is "Journalism and candidate self-selection across governments levels". Next, Chapter 3 is presented, and the title is "The Mexican political system and its consequences on political corruption". The last section presents the conclusion of this thesis.

Chapter 1

Information spillovers among jurisdictions to discipline politicians

José Antonio Carrillo-Viramontes

Abstract

In yardstick competition, the availability of neighbouring information is crucial for voters to increase political accountability. Using a three-jurisdiction yardstick competition model and considering three measures of incumbent performance, this paper shows that politicians in isolated jurisdictions (i.e., without media spillover) have a higher probability of capturing private rents. Whereas in a jurisdiction connected with two neighbouring jurisdictions (i.e., with media spillovers), politicians have a lower probability of engaging in rent extraction. I also show that even incumbents in isolated jurisdictions have higher discipline index due to positive spillovers from neighbouring jurisdictions via voters' incumbency advantage. In other words, yardstick competition creates positive spillovers (although small) even for those jurisdictions which are isolated.

Keywords: Yardstick competition, information spillovers, political accountability, corruption.

JEL Classification Numbers: D72, H23, H73.

1.1 Introduction

There are many factors which political corruption may be explained. For example, [Meier and Holbrook \(1992\)](#) analyse cultural, political, structural, and bureaucratic features that are related to political corruption. However, political corruption is also affected by geographic features. [Campante and Do \(2014\)](#) and [Goel and Nelson \(2010\)](#), found evidence that isolated cities and less geographic concentrated countries may have higher corruption since it is relatively harder to account for geographically dispersed locations.

One way in which voters can reduce political corruption and appraise political performance is through yardstick competition. Voters compare the performance of politicians in neighbouring localities with that of their own local politician, thus creating political accountability and incentives to behave efficiently.¹ For example, [Belleflamme and Hindriks \(2005\)](#) develop a political agency model to analyse the effectiveness of yardstick competition and find that yardstick comparison helps to discipline politicians because voters can detect non-valuable policies and bad incumbents. In this context, the availability of the neighbouring information is crucial for voters to increase political accountability by making performance comparisons.

Nevertheless, the information available to voters can be limited. According to [Avraham \(2000\)](#), local papers devote more media coverage to nearby places than far away ones. Furthermore, citizens are better informed about neighbouring places. In the book entitled *Global Crisis*, Geoffrey Parker writes:

[...] One French intellectual complained that newspapers 'make people know too much about their own affairs as well as about those of their neighbours. [from [Parker \(2013\)](#) pp. 571] . .

The view expressed in [Parker \(2013\)](#) highlights how citizens' information is biased toward

¹ [Bordignon et al. \(2004\)](#) and [Besley and Smart \(2007\)](#), show that yardstick competition can have a negative side since creates no incentives for bad politicians to behave well, and therefore, set non-valuable policies.

local and neighbours events.

The aim of this paper is to analyse how voters use information from media spillovers to discipline politicians, but the spillovers depend on the geographic localization of the jurisdiction. The localization of a jurisdiction may or may not provide external policy information depending on the spillovers between the jurisdictions. Motivated by the theoretical model of [Besley and Case \(1995\)](#), in which voters observe neighbour's policy and compare it against their own policy in order to solve a political agency problem, I develop a three-jurisdiction yardstick competition model to capture the novel idea that a jurisdiction localization can affect the information flow across voters and, therefore, politician's behaviour.

To analyse the effects of media spillovers across jurisdiction on politicians' discipline, I consider three measures of performance and compare them across models. The three measures are discipline index, selection effect and accountability ratio.

I consider three identical jurisdictions; each jurisdiction is populated by a representative voter and an incumbent politician. The three jurisdictions are affected by an exogenous economic shock which can be low or high, and is only observed by politicians. Politicians are either good or bad. Good politicians always set the correct policy, that is, a tax that is equal to the economic shock. For example, if a good politician observes a low shock then, he sets a low tax, whereas if he observes a high shock then he sets a high tax policy. In contrast, bad politicians can set a higher tax than the economic shock, and obtain a positive private rent. For example, if a bad politician observes a low shock then he can or cannot set a high tax and obtain a private rent. When a bad politician observes a high shock he can only set a high tax.²

The voter observes the policy selected by the politician in her jurisdiction and depending on her jurisdiction localization, she can or cannot observe the policy implemented in neighbour jurisdiction(s) and compare it against the policy set by their own politician. Finally, the voter updates her beliefs about her own politician's type (whether is good or bad) and

²For simplicity, we assume no debt on the policy implemented.

decides to re-elect the politician or elect an exogenous challenger.

I find that yardstick competition is effective. The main result is that politicians in isolated jurisdictions (i.e., jurisdictions without media spillovers from neighbours) are more likely to set a policy that does not coincide with the shock, that is, a higher probability of capturing private rents. In comparison, politicians in jurisdictions with media spillovers from two neighbouring jurisdictions have a lower probability of setting a policy that does not coincide with the economic shock, that is, are less likely of capturing private rents. An interesting result is that even incumbents in isolated jurisdictions have higher discipline index due to positive spillovers from neighbouring jurisdictions via voters' incumbency advantage. In other words, yardstick competition creates positive spillovers (although small) even for those jurisdictions which are isolated.

These findings depend on the information that voters can have access. For instance, in the isolated jurisdiction voters cannot compare the policy observed, therefore, the incumbent politician has an advantage which is turned into positive private rents. Instead, when voters have information from other two jurisdictions and compare their policy with the neighbours', the politician is less likely to capture private rents since voters are better informed.

The idea of performance comparison to overcome a political agency problem is not new in literature. For example, ([Besley and Case, 1995](#)) analyse theoretically how voters make comparisons between states to evaluate their own incumbents (yardstick competition), and they provide empirical evidence of yardstick competition for U.S. states for the period 1960 to 1988. Although the model presented here is similar in spirit as the theoretical example in [Besley and Case \(1995\)](#), their study differs from the one presented here in the following way. In this study, the information available for voters to make comparisons depends on the jurisdiction localization, whereas in their study this feature is not considered. Indeed, the localization of a jurisdiction might determine the availability of an information that voters can use to perform yardstick competition.

Empirically, there is supporting evidence regarding how isolated cities are more associated

with political corruption. For instance, [Campante and Do \(2014\)](#) proved that isolated cities in the U.S are more associated with higher levels of corruption. They measure the average of the log of the distance of the state's population to the capital city and found a direct evidence linking isolated capital cities to lower accountability, and therefore, less isolated cities with higher accountability. Additionally([Campante *et al.*, 2013](#)), use an endogenous institutional choice framework, where the key assumption is that rebellions against the elite are more effective when they take place closer to the capital city. One of the main results is that autocratic elites can extract more private rents from isolated cities without triggering a rebellion. In other words, isolated cities are highly associated with misgovernance.

Similarly, [Larreguy *et al.* \(2014\)](#) investigate the effect of Mexican media outlets on electoral accountability. Specifically, they analyse the electoral effects of the release of municipal audit reports on the use of the Municipal Fund for Social Infrastructure (FISM). The Fund represents around 24 percent of total municipality's resources, and the audits are made by an independent institution, Mexico's Federal Auditor's Office (ASF) on time random basis. Since re-election is not possible in Mexico due to term limits, voters may punish the political party of the malfeasant mayor in the next election. Their main result is that an additional local media station in the Mexican municipality reduces the vote share of the incumbent political party whose mayor was revealed to be corrupt. The effect is larger if the local media station is a television station. The reason is that a TV station is the main political information source for voters.

The outline of the paper is as follows. Section [1.2](#) presents the basic three-jurisdiction model. Then, section [1.3](#) presents the different jurisdictions structures and it's equilibrium analysis. In section [1.4](#), implications and results are discussed, and the last section concludes.

1.2 The model

Consider a country with three identical jurisdictions (e.g., a state in a federal country), each populated by two players: an incumbent politician (he) and a representative voter (she). The incumbent can be either “good” or “bad”. The probability that an incumbent is type good is represented by $\gamma \in (0, 1)$. Moreover, I consider an exogenous economic shock, which is either low or high, with $q \in (0, 1)$ being the probability of a high shock. The following assumption on the economic shock is imposed.

Assumption 1. *The economic shock (high or low) is the same across the jurisdictions and is observed by all jurisdictions’ incumbents.*³

The incumbent observes the shock and chooses a policy T_L or T_H , where $0 < T_L < T_H$. The good incumbent and voters prefer a tax T_H when the shock is high, and T_L when the shock is low. Bad incumbent prefers T_H in any economic shock.

A pure strategy for the incumbent politician is simply a low tax T_L or a high tax T_H . Observe that, given our assumptions above, we only need to specify the incumbent’s choice before the election and only when he is bad and the shock is low — his decisions are exogenously constrained in all other cases. Therefore, a mixed strategy for the incumbent politician is the probability $x \in [0, 1]$ that he sets the low tax T_L when the shock is low.⁴ As the voter only observes the incumbent’s policy choice before the election, her strategy is a pair $(y_L, y_H) \in [0, 1]^2$, where y_L (resp. y_H) stands for the probability that she chooses to re-elect when she observes policy T_L (resp. T_H).

We now turn to the players’ payoffs. Let $\Delta_1 > 0$ be the incumbent’s private rent for setting T_H when the shock is low, and zero if he sets T_L . However, given his preferences,

³This assumption is necessary because allows voters to have a stable point of policy comparison, and its standard in the yardstick competition literature (see [Besley and Case \(1995\)](#), [Besley and Smart \(2007\)](#), [Bordignon et al. \(2004\)](#), [Caldeira \(2012\)](#), among others.) Incumbents’ types, however, are privately observed.. If we relax this assumption, the extra information could be useless since creates a distortion in the comparison point.

⁴Let x be interpreted also as a discipline index (see [Besley \(2007\)](#)).

he always chooses high tax T_H in period 2, obtaining a private rent $\Delta_2 > \Delta_1$.⁵ We consider mixed strategies, therefore we can write a strategy profile (x, y_L, y_H) . The incumbent politician’s expected payoff (when he is bad and the state is low) is therefore

$$u_P(x, y_L, y_H) \equiv xy_L\Delta_2 + (1 - x) [\Delta_1 + y_H\Delta_2] .$$

The incumbent politician’s payoff depends on the tax he sets, the voter probability of re-election and the payoff he obtains for the strategy. This represents the uncertainty about voter’s decision. Let $\mu + \beta$ be the voter’s payoff when she re-elects the incumbent, and γ when she does not re-elect the incumbent and elect the challenger. When the voter decides to re-elect she obtains μ , which is the updated beliefs of an incumbent being good, plus β which is the incumbency advantage.⁶ If she decides to not re-elect the incumbent and elect a challenger, she obtains γ which is the probability of a challenger being good.

Since we are interested in how the availability of voters’ information affects politicians behaviour, we developed four cases in which jurisdictions have different connections among them. The first one is where the three jurisdictions are not connected among them (i.e., zero-link structure). These jurisdictions are not connected between them, therefore, voters cannot make any policy comparison.⁷ The following figure illustrates the idea.

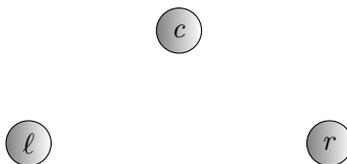


Figure 1.2.1: Zero-link structure

The second structure, is when two of three jurisdictions are connected, that is, a one-link structure.

⁵This would be the case if there were incentives for an incumbent to be in office like “ego rents”, “legacy effects” or simply attractive perks and wages. See section 3.2.2 in [Besley \(2007\)](#) for an explanation of these.

⁶See [Fernandez and Rodrik \(1991\)](#) for a positive analysis incumbency and resistance to reforms. Also, notice that u_p does not depend directly on β , therefore, the voter is the only one that perceives the incumbency advantage.

⁷Since the three jurisdictions are identical we only analyse one of them.

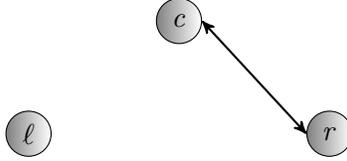


Figure 1.2.2: One-link structure

Notice two things. First, jurisdiction ℓ is not connected, therefore, the voter in jurisdiction ℓ cannot make any policy comparison. Second, the link between jurisdictions c and r is symmetrical, therefore, corresponds to the same case as if jurisdictions ℓ and c are connected, and conversely if jurisdictions ℓ and r are linked. Moreover, the link between jurisdictions c and r allow voters to compare policies among these jurisdictions.

In the case when two links among three jurisdictions exists (i.e., two-link structure), the jurisdiction- ℓ voter can only observe the policy implemented in her jurisdiction and jurisdiction- c . Likewise, the jurisdiction- r voter can only observe her jurisdiction and jurisdiction- c policy. On the other hand, the voter in jurisdiction c can observe both, the policy implemented in jurisdiction ℓ and policy in jurisdiction r .⁸ Keeping the same assumptions as in the previous scenario, we only incorporate the following:

Assumption 2. *The policy implemented (high or low) in jurisdiction c is observed across all jurisdictions. However, jurisdiction- ℓ policy is observed by voter's in jurisdiction ℓ and c . Symmetrically, jurisdiction- r policy is only observed by voters in jurisdiction r and c .*⁹

The Figure 1.2.3 illustrates Assumption 2.

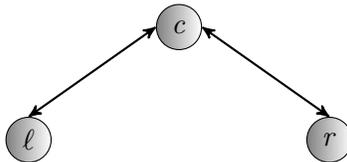


Figure 1.2.3: Two-link structure

⁸Notice that peripheral jurisdictions (i.e., ℓ and r) will face an identical scenario as in the one-linked scenario.

⁹This assumption goes in line with the idea that information spillovers decrease over distance, and with Geys (2006), who says that geographic neighbours have an effect in local government policies. In addition, Revelli (2006) have proved the effect of geographic neighbours in yardstick competition.

Finally, we present the three-link structure. In this case, it is important to notice two things. First, there is no difference for players in jurisdiction c between this case and the two-link structure case. Second, in the case of the peripheral jurisdictions (i.e., ℓ and r) now they have to consider an extra jurisdiction in comparison to the two-link structure case, making peripheral incumbents to face the same scenario as jurisdiction- c incumbent. Therefore, in this case, all jurisdictions can make policy comparisons with any jurisdiction. The Figure 1.2.4 illustrates the scenario.

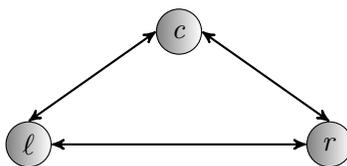


Figure 1.2.4: Three-link structure

The equilibrium concept employed is perfect Bayesian equilibrium (e.g., [Fudenberg and Tirole \(1991\)](#)). In particular, the equilibrium beliefs of the representative voter are obtained from Bayes' Rule. The timing of events within each jurisdiction is as follows:

1. Nature chooses the incumbents' type and the type of the economic shock.
2. The incumbent politician observes the realization of the shock, and then chooses a policy.
3. The voter observes the policy selected by the incumbent politician in her jurisdiction.
4. The voter decides whether to re-elect him or to elect a challenger.
5. The elected politician chooses his preferred policy in the second period, thereafter the game ends.

1.3 Equilibrium Analysis

1.3.1 Zero-link structure

I analyse first the model of zero-link structure. The voter's beliefs about incumbent's type in the zero-link structure are illustrated in the following lemma.

Lemma 1. *Given any incumbent's strategy $x \in [0, 1]$, the voter's updated beliefs when she observes a low tax T_L , and when she observes a high tax T_H , respectively are*

$$\begin{aligned}\mu_L(x) &= \frac{\gamma}{\gamma + x(1 - \gamma)} , \\ \mu_H(x) &= \frac{q\gamma}{q + (1 - x)(1 - q)(1 - \gamma)} ,\end{aligned}$$

when the realization of the state is low and high, respectively.

In words, μ_L is the probability that the incumbent is good when the voter observes a tax T_L . Similarly, μ_H is the probability that the incumbent is good when the voter observes a tax T_H . Moreover, we can compare equations in Lemma 1, and observe that the probability of an incumbent being good when there is a high shock is lower than the probability when the shock is low. Thus, the voter must be more willing to re-elect if she observes a low tax than a high tax. The following lemma expands on that.

Lemma 2. *If (x, y_L, y_H) is a PBE, then the following is true in each jurisdiction:*

(i) *if the voter is indifferent between re-electing and not re-electing when she observes T_H , then $y_L = 1$;*

(ii) *if the voter is indifferent between re-electing and not re-electing when she observes T_L , then $y_H = 0$.*

Proof. The voter is indifferent between re-electing and not re-electing if and only if

$$\frac{q\gamma}{q + (1 - x)(1 - q)(1 - \gamma)} + \beta = \gamma \tag{1.3.1}$$

when he observes T_H , and

$$\frac{\gamma}{\gamma + x(1 - \gamma)} + \beta = \gamma \quad (1.3.2)$$

when he observes T_L . These equalities can be rewritten as

$$x = 1 + \frac{1}{1 - \gamma} \frac{q}{1 - q} \left(1 - \frac{1}{\gamma - \beta} \right), \quad (1.3.3)$$

and

$$x = \frac{\gamma}{1 - \gamma} \left(\frac{1}{\gamma - \beta} - 1 \right) \quad (1.3.4)$$

respectively. The difference between the values of x in (1.3.4) and (1.3.3) is $\beta/[(1 - \gamma)(\gamma - \beta)(1 - q)]$, which is never zero. Hence, (1.3.1) and (1.3.2) cannot hold simultaneously. This in turn implies that:

(a) if the voter is indifferent between re-electing and not re-electing when she observes T_H , then $y_L \in \{0, 1\}$;

(b) if the voter is indifferent between re-electing and not re-electing when she observes T_L , then $y_H \in \{0, 1\}$.

To complete the proof of the lemma, we therefore have to prove that $y_L = 1$ in case (a) and $y_H = 0$ in case (b). To see that y_L is never equal to zero (i.e., that the voter prefers not to re-elect) in case (a), simply observe that the left-hand side of (1.3.2) is always strictly greater than γ (recall that $\beta > 0$). This proves part (i) of the lemma. Now consider case (b). As (1.3.2) holds, y_H equals 0 in equilibrium if and only if

$$\frac{q\gamma}{q + (1 - x)(1 - q)(1 - \gamma)} + \beta < \gamma = \frac{\gamma}{\gamma + x(1 - \gamma)} + \beta,$$

which can be rewritten as $\gamma(1 - \gamma)(1 - x) \leq 0$. This inequality, however, can only be satisfied if $x = 0$ and, in equilibrium, the politician's optimal strategy is to choose T_H with probability 1 (i.e., $x = 0$) if y_H . This proves the second part of the lemma. \square

Using Lemma 2, we can establish

Proposition 1. *If $0 < \beta < \gamma \left(1 - \frac{q}{(1-\gamma)(1-q)+q}\right)$, then the unique PBE is*

$$(x, y_L, y_H) = \left(1 - \frac{q\beta}{(1-\gamma)(1-q)(\gamma-\beta)}, 1, \frac{\Delta_2 - \Delta_1}{\Delta_2}\right) ;$$

otherwise, if $\beta > \gamma \left(1 - \frac{q}{(1-\gamma)(1-q)+q}\right)$ the unique PBE is $(x, y_L, y_H) = (0, 1, 1)$.

Intuitively, if the incumbency advantage β is sufficiently low, then the voter re-elects when she observes a tax T_L , and is indifferent between re electing and not re-electing when she observes a tax T_H . Similarly, the incumbent is indifferent between setting a tax T_L and a tax T_H when the incumbency advantage is sufficiently low. On the other hand, if the incumbency advantage is sufficiently large, i.e., $\beta > \gamma \left(1 - \frac{q}{(1-\gamma)(1-q)+q}\right)$, then the voter re-elects if she observes either T_L or T_H , since the cost of not re electing is high. Therefore, incumbent choose his preferred tax T_H .

In this case when jurisdictions are isolated (i.e., zero-link among them), the probability that an incumbent set a tax T_L when the shock is low is $x = 1 - \frac{q\beta}{(1-\gamma)(1-q)(\gamma-\beta)}$.

1.3.2 One-link structure

Now, consider that two of the three jurisdictions are connected by one link (recall Figure 1.2.2). Since the jurisdiction- l case simply corresponds to the zero-link model analysed before, we focus on the case where two jurisdictions are connected. For this case, we only need to consider four players: an incumbent politician (he) and a representative voter (she) in each jurisdiction (e.g., c and r).

Let us describe the players' strategies. Focusing on symmetric equilibria we only need to specify the voter's choice in one jurisdiction and both jurisdictions incumbents' choices before the election, and only when he is bad and the shock is low. Therefore, a strategy for the incumbent politician in jurisdiction r is simply represented as the probability $x^r \in [0, 1]$ that he sets a low tax T_L when the shock is low. Analogously, $x^c \in [0, 1]$ is the probability that incumbent politician in jurisdiction c sets a low tax T_L when the shock is low.

As the voter in jurisdiction r observes both incumbents' policy choices before the election, her strategy can be represented as a quadruple $(y_L^L, y_H^L, y_L^H, y_H^H) \in [0, 1]^4$, where y_L^L (resp. y_H^H) is the probability that she chooses to re-elect when she observes policy T_L (resp. T_H) in both jurisdictions. y_L^H is the probability that she chooses to re-elect when she observes policy T_L in her jurisdiction and policy T_H in the other jurisdiction, and y_H^L otherwise. Therefore now the voter's choice, depends not only on the policy she observes in her jurisdiction but, also the information they have from other jurisdictions.

We can now describe the players' payoffs. Given a strategy profile (x^r, x^c, Y^r, Y^c) , where $Y^l = Y^r = y_L^L, y_H^L, y_L^H, y_H^H$; the incumbent politician's payoff is therefore

$$\begin{aligned} u_P^r(x^r, x^c, y_L^L, y_H^L, y_L^H, y_H^H) &\equiv x^r x^c y_L^L \Delta_2 + x^r (1 - x^c) y_H^L \Delta_2 \\ &+ (1 - x^r) x^c [\Delta_1 + y_L^H \Delta_2] + (1 - x^r) (1 - x^c) [\Delta_1 + y_H^H \Delta_2] . \end{aligned}$$

The incumbent politician's payoff depends now not only on the tax he sets, but also in the tax that his linked neighbour sets, the voter probability of re-election and the payoff he obtains for the strategy implemented. The incumbent's payoff function has higher uncertainty in comparison to the previous model. We assume the same voter preferences as in the benchmark case, that the voter's utility is given by $\mu + \beta$, when she re-elects the incumbent and γ when she does not re-elect the incumbent.

The equilibrium beliefs of the representative voter are obtained from Bayes' Rule.

Lemma 3. *Given any incumbents' strategy $x^r \in [0, 1]$, $\forall i, j \in \{L, H\}^2$ let μ_j^i be the jurisdiction- r voter's beliefs*

$$\begin{aligned} \mu_H^L(x^r) &= \mu_L^L(x^r) = \frac{\gamma}{\gamma + x^r (1 - \gamma)} , \\ \mu_L^H(x^r) &= 0 , \\ \mu_H^H(x^r, x^c) &= \frac{q\gamma}{q + (1 - x^r) (1 - x^c) (1 - q) (1 - \gamma)^2} . \end{aligned}$$

when the realization of the state is low in both jurisdictions, low in jurisdiction r and high in the other, high in jurisdiction r and low in the other jurisdiction, and high in both jurisdictions, respectively.

In words, the probability that an incumbent is good when the voter observes a tax T_L in the two jurisdictions and when she observes a tax T_L in her jurisdiction and tax T_H in the other jurisdiction it is the same. Instead, when the voter observes a high tax in her jurisdiction and a low tax in the other jurisdiction, then the voter is sure that the incumbent in her jurisdiction is bad, that is, $\mu_L^H = 0$. Lemma 3 has the following implications. The updated beliefs when the voter observes policy T_L in both jurisdictions and when she observes low tax T_L in her jurisdiction and T_H in neighbour jurisdiction (jurisdiction c) are equivalent (i.e., $\mu_L^L(x^r) = \mu_H^L(x^r)$). In the case where the jurisdiction- r voter observes tax T_H in her jurisdiction and a low tax in the neighbour jurisdiction, the voter knows that her incumbent is bad. Therefore, $\mu_L^H(x^r, x^c) = 0$.

The following Lemma establishes that if the incumbency advantage β is smaller than the probability of the incumbent being type good, then the voter in jurisdiction r is better off re electing when she observes the same tax in both regions, and when she observes a low tax in her jurisdiction and a high tax in neighbours. On the contrary, the voter in jurisdiction r will not re-elect her incumbent if she observes a high tax on her jurisdiction and a low tax in neighbours. This result is similar to main implications of the theoretical model of Besley and Case (1995), although they consider more shocks and tax choices.

Lemma 4. *If $0 < \beta < \gamma$, then the following is true in any PBE:*

- (i) *A jurisdiction- r voter re-elects when she observes T_L in both jurisdictions;*
- (ii) *A jurisdiction- r voter re-elects when she observes T_L in her jurisdiction and T_H in neighbour jurisdiction, and does not re-elects when the opposite occurs (i.e., T_H in her jurisdiction and T_L in neighbour).*

Proof. Suppose incumbents set a tax T_L in both jurisdictions. Consider jurisdiction r (the

other case is symmetric). Then jurisdiction- r voter re-elects if and only if

$$\frac{\gamma}{\gamma + x^r(1 - \gamma)} + \beta > \gamma .$$

To prove that this inequality always holds, simply observe that LHS is always strictly greater than γ , for all $x^r \in [0, 1]$. This proves part (i) of the lemma. Now consider part (ii). Suppose first, jurisdiction- r incumbent set T_L and neighbour incumbent set policy T_H . Then, jurisdiction- r voter re-elects if and only if

$$\frac{\gamma}{\gamma + x^r(1 - \gamma)} + \beta > \gamma .$$

Again, simply observe that LHS is always strictly greater than γ , for all $x^r \in [0, 1]$. Now let us prove that the jurisdiction- r voter does not re-elect when she observes policy T_H in her jurisdiction and T_L in the other jurisdiction. the voter does not re-elect if and only if $\mu_L^H = 0 + \beta < \gamma$, which holds from our assumption that $0 < \beta < \gamma$. Hence, the voter does not re-elect her incumbent. This completes the proof of the lemma. \square

The following result characterizes a mixed PBE.

Proposition 2. *If $0 < \beta < \gamma(1 - \frac{q}{q+(1-q)(1-\gamma)^2}) < \gamma$, then the unique PBE is one in which:*

(i) *Politicians in jurisdictions c and r will set a tax T_L with probability*

$$1 - \sqrt{\frac{\beta q}{(\gamma - \beta)(1 - q)(1 - \gamma)^2}}$$

(ii) *Voters in jurisdictions c and r will re-elect with probability $\frac{(\Delta_2 - \Delta_1)(\gamma - \beta)(1 - q)(1 - \gamma)^2}{\Delta_2 \beta q}$ when observe a tax T_H . If they observe a tax T_L they will re-elect if $y_L^L = y_H^L = 1$ and not re-elect if $y_L^H = 0$.*

If $\beta > \gamma(1 - \frac{q}{q+(1-q)(1-\gamma)^2}) > \gamma$, then the unique PBE is one in which:

(i) *Politicians in jurisdictions c and r will set a tax T_H .*

(ii) Voters re-elect if $y_L^L = y_H^L = y_H^H = 1$ and not re-elect if $y_L^H = 0$.

Proposition 2 states that when the incumbency advantage is sufficiently low, both incumbents (r and c) are mixing between setting a tax T_L and T_H . Voters are mixing when observe a tax T_H in both jurisdictions. As before, if β is sufficiently high, incumbents in both jurisdictions set a tax T_H and both voters re-elect when observe a tax T_H in both jurisdictions.

1.3.3 Two-link structure

Now, consider the case in which two jurisdictions are connected, like in Figure 1.2.3. Therefore, we have six players: an incumbent politician (he) and a representative voter (she), in each jurisdiction (e.g., ℓ , c and r). In other words, the jurisdiction- ℓ voter can only observe the policy implemented in her jurisdiction and jurisdiction- c . Likewise, the jurisdiction- r voter can only observe her jurisdiction and jurisdiction- c policy. On the other hand, voter in jurisdiction c can observe both, the policy implemented in jurisdiction ℓ and policy in jurisdiction r .¹⁰

Let us now describe the players' strategies. Focusing on jurisdiction- c voter's choice and two jurisdictions incumbents' choices (either c and ℓ , or c and r due to symmetry) before the election and only when they are bad and the shock is low. Therefore, a strategy for the incumbent politician in jurisdiction c is simply represented as the probability $x^c \in [0, 1]$ that he sets a low tax T_L when the shock is low. As voter in jurisdiction c observes all incumbents' policy choices before the election, her strategy can be represented as (Y^ℓ, Y^c, Y^r) where $Y^\ell = Y^r = y_L^L, y_H^L, y_L^H, y_H^H$. Moreover, $Y^c = y_{\ell r}^i$ for all $i, \ell, r \in \{L, H\}$, which is the probability that jurisdiction- c voter chooses re-elect when she observes i in her jurisdiction, ℓ in left jurisdiction, r in right jurisdiction.

We can now describe players' payoffs. Remember from previous models that, if and only

¹⁰Notice that peripheral jurisdictions (i.e., ℓ and r) will face an identical scenario as in the two-connected jurisdictions model.

if the shock is low and he sets tax T_H , the (bad) incumbent obtains a private rent $\Delta_1 > 0$ before the election. When re-elected, he always picks the high tax T_H , thus obtaining a private rent $\Delta_2 > \Delta_1$. The incumbent politician's payoff (when he is bad and the shock is low) is

$$U_p^c(x^\ell, x^c, x^r, Y^c) = \Pi(4\Delta_1 + \Psi\Delta_2)$$

where $\Pi = x^\ell x^c x^r + x^\ell x^c(1 - x^r) + (1 - x^\ell)x^c x^r + (1 - x^\ell)x^c(1 - x^r) + x^\ell(1 - x^c)x^r + x^\ell(1 - x^c)(1 - x^r) + (1 - x^\ell)(1 - x^c)x^r + (1 - x^\ell)(1 - x^c)(1 - x^r)$, and $\Psi = y_{LL}^L + y_{LH}^L + y_{HL}^L + y_{HH}^L + y_{LL}^H + y_{LH}^H + y_{HL}^H + y_{HH}^H$. Recall that $x^j \in (0, 1)$, is the probability that jurisdiction- j incumbent, where $j = l, c, r$ sets tax T_L and voter's utility is given by $\mu + \beta$, when she re-elects the incumbent and γ when she does not re-elect the incumbent. As before, incumbent politician's payoff depends now not only on the tax he sets, but also in the tax that his linked neighbour sets, the voter probability of re-election and the payoff he obtains for the strategy implemented. The incumbent's payoff function has higher uncertainty in comparison to the previous model.

The equilibrium beliefs of the representative voter in jurisdiction c are obtained from Bayes' Rule.

Lemma 5. *Given any incumbents' strategy $x^c \in [0, 1]$, $\forall i, j, z \in \{L, H\}^2$ let $\mu_{j,z}^i$ be the jurisdiction- c voter's beliefs*

$$\begin{aligned} \mu_{LL}^L &= \mu_{HL}^L = \mu_{LH}^L = \mu_{HH}^L(x^c) \equiv \frac{\gamma}{\gamma + x^c(1 - \gamma)} , \\ \mu_{LH}^H &= \mu_{HL}^H = \mu_{LL}^H(x^r, x^\ell) \equiv 0 , \\ \mu_{HH}^H(x^r, x^c) &\equiv \frac{q\gamma}{q + (1 - x^\ell)(1 - x^r)(1 - x^c)(1 - q)(1 - \gamma)^3} . \end{aligned}$$

for all possible realization of the state (Low and High) and for all jurisdictions (ℓ, c , and r).

Lemma 5 has some implications. First, the jurisdiction- c voter's beliefs are equal to the other possible scenarios when she observes a tax T_L in her jurisdiction. Second, if the

voter observes a tax T_H in her jurisdiction but a tax T_L in at least one of the two linked jurisdictions, then the voter knows that her incumbent is a bad type. In the case when she observes a tax T_H in all jurisdictions, the voter is unsure about incumbent's type. Using Lemma 5 we can state the following:

Lemma 6. *If $0 < \beta < \gamma$, then the following is true:*

- (i) *The jurisdiction- c voter re-elects when she observes T_L in her jurisdiction;*
- (ii) *The jurisdiction- c voter does not re-elect when she observes a tax T_H in her jurisdiction and at least a tax T_L in one of the neighbour jurisdictions.*

Proof. First, recall that $\mu_{LL}^L = \mu_{HL}^L = \mu_{HL}^L = \mu_{HH}^L$ are equal. Hence, let us prove the case when jurisdiction- c voter observes tax T_L in all jurisdictions. Suppose incumbents set a tax T_L in all jurisdictions. Then, jurisdiction- c voter re-elects if

$$\frac{\gamma}{\gamma + x^c(1 - \gamma)} + \beta > \gamma.$$

To prove that this inequality always holds, simply observe that LHS is always strictly greater than γ , for all $(x^c) \in [0, 1]$. Similarly, now consider the case when jurisdiction- c voter observes tax T_L in her jurisdiction and a tax T_H in at least one neighbour jurisdiction. This proves part (i) of Lemma. Now consider part (ii) of the Lemma 6. Notice that, we only need to prove only one case, since are equal in terms of beliefs (i.e., all are 0). Therefore, consider the case where the jurisdiction- c voter observes a tax T_H in her jurisdiction and a tax T_L in neighbour jurisdictions. The jurisdiction- c voter does not re-elect if $\beta < \gamma$; which clearly holds since $\beta < \gamma$. Therefore, the jurisdiction- c voter does not re-elect. This completes the proof of Lemma 6. □

Lemma 6 is a stronger version of Lemma 4. The reason is that having another link connected to jurisdiction c implies that now jurisdiction- c voter needs at least one neighbour setting a low tax to detect if her incumbent politicians is type good, given that her incumbent

sets a high tax. This extra link has also important implications for the incumbent behaviour. This implications are stated in the following result.

Proposition 3. *If $0 < \beta < \gamma(1 - \frac{q}{q+(1-q)(1-\gamma)^3}) < \gamma$, then the unique PBE is one in which:*

(i) *Incumbents are indifferent at $x^i = 1 - \sqrt{\frac{\beta q}{(\gamma-\beta)(1-q)(1-\gamma)^3}}$ for jurisdictions $i = \ell, r$ and $x^c = 1 - \frac{\beta q}{(\gamma-\beta)(1-x)^2(1-q)(1-\gamma)^3}$ for jurisdiction-c.*

(ii) *Voters are indifferent when observes $Y_{H,H}^H = \frac{\Delta_2 - \Delta_1}{\Delta_2 \sqrt[3]{\frac{\beta q}{(\gamma-\beta)(1-q)(1-\gamma)^2}}}$ in jurisdiction-c, and $Y_H^H = \frac{(\Delta_2 - \Delta_1)(\gamma-\beta)(1-q)(1-\gamma)^2}{\Delta_2 \beta q}$ in jurisdictions ℓ and r .*

Otherwise the unique PBE is one in which incumbents set $x^j = 0$ for $j = \ell, c, r$ and voters set $Y_{H,H}^H = 1$ in jurisdiction-c and $Y_H^H = 1$ in jurisdictions ℓ and r .

When the incumbency advantage is sufficiently low, the three incumbents randomize between tax T_H and T_L . Similarly, the voter's in each jurisdiction are indifferent between re-electing and not re-electing when observes a tax T_H in all jurisdictions. On the other hand, if β is sufficiently high, all incumbents set a tax T_H and all voters re-elect their incumbent when they observe a tax T_H .

1.3.4 Three-link structure

Finally, consider the case when the three jurisdictions have a link between them. In this case, it is important to notice two things. First, jurisdiction c has the same links with other jurisdictions as in the previous model, therefore, voter's strategy and payoff remain unchanged.¹¹ However, since the neighbouring jurisdictions (i.e., jurisdiction ℓ and r) are now connected, jurisdiction-c incumbent is affected via his neighbour incumbents. Second, peripheral jurisdictions (i.e., ℓ and r) now face the same scenario as jurisdiction-c. Thus, the probability of an incumbent (in any jurisdiction) to set a low tax, when the shock is low is

$$x = 1 - \sqrt[3]{\frac{\beta q}{(\gamma - \beta)(1 - q)(1 - \gamma)^3}}.$$

¹¹The equilibrium in this model is the same as in the previous one, with an exception of x^c which is larger.

In short, full connection across the three jurisdictions increases the probability of an incumbent of setting a tax that match the shock if we compare it against the two-linked model.¹²

1.4 Implications

1.4.1 Measures of performance

In this section I compare and analyse incumbents and voters behaviour in the different models. To do so, I consider three measures of performance. The first one is the discipline index (i.e. x). The index measures the probability that the incumbent set a low tax T_L when the economic shock is low. The second measure is the selection effect. This effect is represented by the probability of re-election when the voter observes a low tax (resp. high tax):

- In her region y^L (resp. y^H).
- In her region and one neighbouring region y_L^L (resp. y_H^H).
- In all regions y_{LL}^L (resp. y_{HH}^H).

The last measure is the accountability ratio A . The ratio represents the relative probability that a bad or good politician get re-elected after being in office.

1.4.1.1 Discipline index

The three-jurisdiction model developed here, produce some insights about incumbent discipline in different jurisdictions. First, jurisdiction- c incumbent has a higher probability to set a low tax when the shock is low than the jurisdiction- r or jurisdiction- ℓ incumbent. This

¹²The comparison of isolated and full connected cases can be reinterpreted as the effect of an imperfect correlation of the economic shock.

can be verified, since

$$x^c = 1 - \sqrt[3]{\frac{\beta q}{(\gamma - \beta)(1 - q)(1 - \gamma)^3}},$$

and

$$x^r = 1 - \sqrt{\frac{\beta q}{(\gamma - \beta)(1 - q)(1 - \gamma)^2}}.$$

Hence, $x^c > x^r$. This result imply that incumbents located in central jurisdictions, exposed to high yardstick competition are less likely to obtain higher private rents. On the other hand, incumbents in peripheral jurisdictions, with less yardstick comparison have higher probability to obtain private rents. This results coincide with the empirical findings of [Campante and Do \(2014\)](#), that is, isolated jurisdictions are associated with higher levels of corruption.

Compared to previous models we have different levels of incumbent's discipline index. The incumbent's discipline depends how exposed her jurisdiction is to yardstick competition. In other words, it depends on the number of links on which voters have access to information (media spillover). This effect is illustrated in Figure 1.4.1.¹³

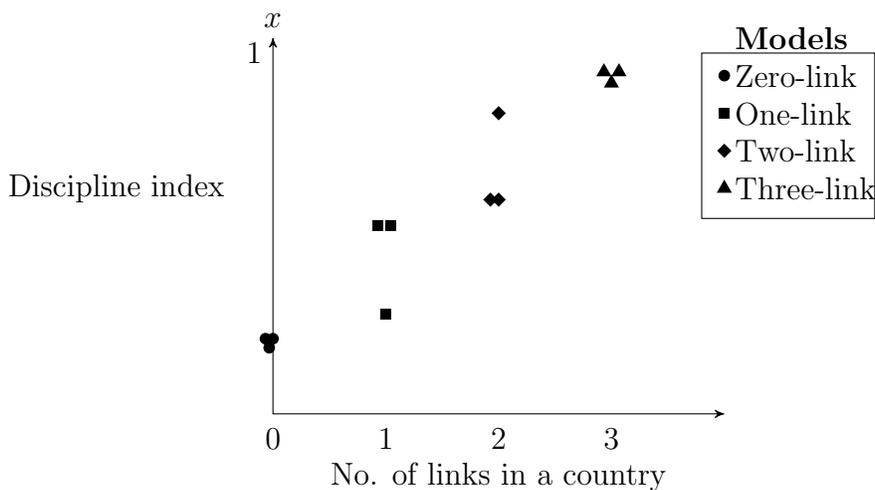


Figure 1.4.1: Incumbent's discipline and yardstick competition

In particular, we can observe a positive relationship between incumbent's discipline index

¹³When two or more jurisdictions have an equal discipline index, points in Figure 1.4.1 are intentionally separated to illustrate the number of jurisdictions.

and the number of links across the country. This means, a bad type politician is more likely to set a tax that matches the economic shock when there are more links in the country, that is more information available from neighbouring jurisdictions (i.e., yardstick competition). When the jurisdiction is isolated (i.e., zero-link) the probability of setting a tax that match the shock is low, that is, $1 - \frac{q\beta}{(1-\gamma)(1-q)(\gamma-\beta)}$. Likewise, when the jurisdiction is linked to other two jurisdictions, the probability of a bad incumbent to set the correct tax is higher, that is, $1 - \sqrt[3]{\frac{\beta q}{(\gamma-\beta)(1-q)(1-\gamma)^3}}$.

An interesting result is that even tough yardstick comparison cannot be performed in an isolated jurisdiction, incumbents' in isolated jurisdictions have higher discipline index. To see why consider the jurisdiction ℓ in the zero-link and one-link structure. Since the jurisdiction has no link in any of the two structures, voters cannot perform any yardstick comparison. Hence, we can expect that both incumbents have the same probability of setting a low tax when the shock is low, that is

$$x = 1 - \frac{\beta q}{(\gamma - \beta)(1 - q)(1 - \gamma)}.$$

However, recall from the equilibrium analysis that the cut-off point of β is different across structures, that is, the zero-link model has a $\beta_0 = \gamma(1 - \frac{q}{q+(1-q)(1-\gamma)})$, whereas the one-link model has a $\beta_1 = \gamma(1 - \frac{q}{q+(1-q)(1-\gamma)^2})$. Therefore, comparing β_0 and β_1 we can observe that $\beta_0 > \beta_1$. Hence, the discipline index in the zero-link structure must be lower than the discipline index in one-link structure, as one can observe in Figure 1.4.1. In summary, even incumbents in isolated jurisdictions have higher discipline index due to positive spillovers from neighbouring jurisdictions via voters' incumbency advantage.

1.4.1.2 Selection effect

From the preceding models we can observe that the voters' beliefs change across structures and, therefore, so does the re-election probability of an incumbent as well. This is illustrated

in the following figure:

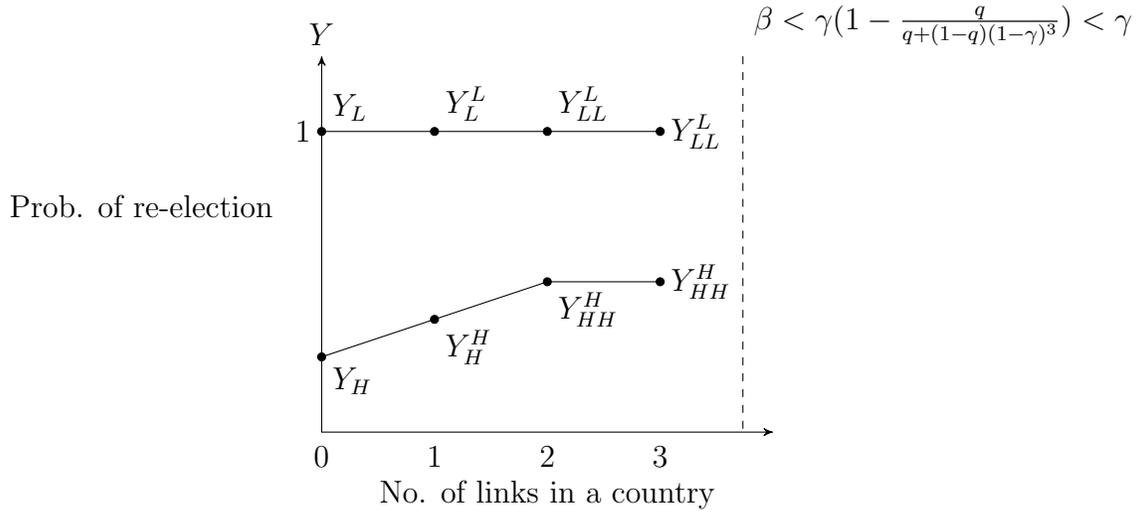


Figure 1.4.2: Re-election probability across structures

Specifically, I draw two main implications from Figure 1.4.2. First, taking β as fixed, the probability of re-election is constant across structures when the voter observes a low tax in her jurisdiction, regardless of the neighbouring policies. In other words, when the voter observes a low tax in her jurisdiction, yardstick competition has no effect on the re-election of incumbents. Second, when the voter observes a high tax in both her jurisdiction and the connected jurisdiction(s), the probability of re-election is increasing with the number of links until the country has two links. The reason is that jurisdiction- c incumbent has the same payoff in the two-link and three-link model, therefore, the probability of re-election remains unchanged. In conclusion, yardstick competition increases the probability of re-election since it is less likely that the three connected incumbents are bad type.

1.4.1.3 Accountability ratio

Following Besley (2005), we can compute the accountability ratio and compare it across models. The accountability ratio (A) is the relative probability that bad and good politicians get re-elected after being in office. Thus, the higher the ratio, the higher the probability of re-electing a bad politician. The accountability ratio is decreasing across structures. In other

words, the more exposed is a jurisdiction to yardstick competition, the relative probability of re-electing a bad politician is low, that is, the accountability ratio A is small. For example, in the zero-link structure, the accountability ratio is

$$A_0 = \frac{(1 - \gamma)[(1 - q)xY_L + (q + (1 - q)(1 - x))Y_H]}{\gamma[(1 - q)Y_L + qY_H]}.$$

In the case of one-link structure, the accountability ratio is

$$A_1 = \frac{(1 - \gamma)^2 qx^2 Y_L^L + (1 - \gamma)^2 qx(1 - x)Y_H^L + [(1 - \gamma)^2 q(1 - x)^2 + (1 - \gamma)(1 - q)(1 - x)]Y_H^H}{\gamma^2(1 - q)Y_L^L + \gamma^2(1 - q)Y_H^L + \gamma^2 qY_H^H}.$$

For the case of two-link structure, the ratio is

$$A_2 = \frac{\omega[(1 - \gamma)^3(1 - q)x^c] + [(1 - \gamma)^3 q(1 - x^c)(1 - x^\ell)(1 - x^r) + (1 - \gamma)(1 - q)(1 - x^c)]Y_{HH}^H}{\gamma^3(1 - q)Y_{LL}^L + \gamma^3(1 - q)Y_{LH}^L + \gamma^3(1 - q)Y_{HL}^L + \gamma^3(1 - q)Y_{HH}^L + \gamma^3 qY_{HH}^H};$$

where $\omega = x^\ell x^r Y_{LL}^L + x^\ell(1 - x^r)Y_{LH}^L + (1 - x^\ell)x^r Y_{HL}^L + (1 - x^\ell)(1 - x^r)Y_{HH}^L$. Comparing the equations above, we can observe that the accountability ratio is decreasing in yardstick competition $A_0 > A_1 > A_2 > 0$, therefore, yardstick competition reduces the relative probability of re-electing a bad politician.

1.5 Concluding remarks

The contribution of the paper is to explain how incumbent behaviour is affected by the information available to voters when this information depends on the media spillover of neighbouring jurisdictions. To analyse the effects of media spillovers across jurisdiction on politicians' discipline, I consider three measures of performance and compare them across models. The three measures are discipline index, selection effect and accountability ratio. Moreover, I developed a three-jurisdiction model and extend it by analysing different connections between the jurisdictions and its effect on incumbent behaviour. The main result is that politicians take advantage of the information available for voters and increase their

private rent if voters are isolated, and decrease it when voters are more informed, that is, are more exposed to media spillover. In other words, a politician's probability of obtaining private rents decreases with yardstick-competition exposure. Another interesting result is that even incumbents in isolated jurisdictions have higher discipline index due to positive spillovers from neighbouring jurisdictions via voters' incumbency advantage.

1.6 Appendix

Proof of Lemma 1.

Proof. Suppose the voter observes a tax T_L . The voter updates her beliefs using Bayes' Rule; that is

$$\mu_L(x) = \frac{\Pr\{T_L|G\} \Pr\{G\}}{\Pr\{T_L|G\} \Pr\{G\} + \Pr\{T_L|B\} \Pr\{B\}} ,$$

where $\Pr\{T_L|G\} = \Pr\{T_L|G, H\} \Pr\{H\} + \Pr\{T_L|G, L\} \Pr\{L\}$ is the probability of observe a tax T_L given that incumbent is good. The probability of observing a tax T_L given the incumbent is bad is $\Pr\{T_L|B\} = \Pr\{T_L|B, H\} \Pr\{H\} + \Pr\{T_L|B, L\} \Pr\{L\}$. As $\Pr\{T_L|G\} = (1 - q)$ and $\Pr\{T_L|B\} = x(1 - q)$,

$$\mu_L(x) = \frac{\gamma(1 - q)}{\gamma(1 - q) + x(1 - q)(1 - \gamma)} ,$$

or equivalently,

$$\mu_L(x) \equiv \frac{\gamma}{\gamma + x(1 - \gamma)} . \tag{1.6.1}$$

Similarly, now suppose the voter observes a tax T_H . Then the voter's belief is

$$\mu_H(x) = \frac{\Pr\{T_H|G\} \Pr\{G\}}{\Pr\{T_H|G\} \Pr\{G\} + \Pr\{T_H|B\} \Pr\{B\}} ,$$

where $\Pr\{T_H|G\} = \Pr\{T_H|G, H\} \Pr\{H\} + \Pr\{T_H|G, L\} \Pr\{L\}$ is the probability of observe a tax T_H given that incumbent is good. The probability of observing a tax T_H given the incumbent is bad is $\Pr\{T_H|B\} = \Pr\{T_H|B, H\} \Pr\{H\} + \Pr\{T_H|B, L\} \Pr\{L\}$. As

$\Pr\{T_H|G\} = q$ and $\Pr\{T_H|B\} = q + (1 - x)(1 - q)$,

$$\mu_H(x) = \frac{q\gamma}{q + (q + (1 - x)(1 - q))(1 - \gamma)} ,$$

or equivalently,

$$\mu_H(x) = \frac{q\gamma}{q + (1 - x)(1 - q)(1 - \gamma)} . \quad (1.6.2)$$

This completes the proof of the lemma. □

Proof of Proposition 1.

Proof. From Lemma 2, we know that if the voter randomizes in a PBE, then this equilibrium is either of the form $(x, 1, y_H)$ or of the form $(x, y_L, 0)$. Consider first $(x, 1, y_H)$. In this case, the incumbent is indifferent if $\Delta_2 = \Delta_1 + \Delta_2 y_H$, when $y_L = 1$. This equality can be rewritten as $y_H = \frac{\Delta_2 - \Delta_1}{\Delta_2}$ to obtain value of y_H in equilibrium. Now, the voter is re-electing if

$$\frac{\gamma}{\gamma + x(1 - \gamma)} + \beta > \gamma , \quad (1.6.3)$$

when she observes T_L , and is indifferent between re-electing and voting the incumbent out if

$$\frac{q\gamma}{q + (1 - x)(1 - q)(1 - \gamma)} + \beta = \gamma , \quad (1.6.4)$$

when she observes T_H . To see that y_L is equal to one (i.e., that the voter prefers to re-elect), simply observe that the left-hand side of (1.6.3) is always strictly greater than γ (recall that $\beta > 0$). This proves that the voter is always better-off re-electing when she observes T_L .

Now consider the case where the voter observes T_H . Recall from equation (1.3.3) that

$$x = 1 + \frac{1}{1 - \gamma} \frac{q}{1 - q} \left(1 - \frac{1}{\gamma - \beta} \right)$$

is the incumbent's indifference equilibrium condition. Hence, the incumbent is indifferent in equilibrium between setting T_L or T_H . Moreover, we need to verify that $x \in [0, 1]$. Considering incumbent's indifference equilibrium condition, we have that

$$\frac{\partial x}{\partial \beta} = \frac{-q\gamma}{(1-\gamma)(\beta-\gamma)^2(1-q)} < 0 .$$

Thus, x is decreasing in β . In other words, higher values of β reduce the probability of the incumbent setting T_L . Hence, $x > 0$ if

$$\beta < \gamma \left(1 - \frac{q}{(1-\gamma)(1-q) + q} \right) , \quad (1.6.5)$$

which is obtained from the indifference condition (1.6.4). This proves that if equation (1.6.5) holds, then $x > 0$. Now we need to check that $x < 1$. Recall that $\beta < \gamma$, so the denominator in $\frac{q\beta}{(1-\gamma)(1-q)(\gamma-\beta)}$ is always positive. Therefore, $-\frac{q\beta}{(1-\gamma)(1-q)(\gamma-\beta)}$ is always negative. Hence, $x < 1$. Now consider $(x, y_L, 0)$. In this case we need that

$$\frac{\gamma}{\gamma + x(1-\gamma)} + \beta = \gamma .$$

Thus, for this equality to hold we need that $\beta < 0$, which clearly violates our assumption that

$$0 < \beta < \gamma \left(1 - \frac{q}{(1-\gamma)(1-q) + q} \right) .$$

Therefore, $(x, y_L, 0)$ cannot be an equilibria. Finally, we need to prove that $(x, y_L, y_H) = (0, 1, 1)$ is a PBE equilibria when

$$\beta > \gamma \left(1 - \frac{q}{(1-\gamma)(1-q) + q} \right) .$$

Suppose that $y_L = y_H = 1$, then the incumbent payoff condition is now $\Delta_2 < (\Delta_1 + \Delta_2)$. Hence, the incumbent is better-off by setting the policy T_H (i.e., $x = 0$). Now, the voter

re-elects if

$$\frac{\gamma}{\gamma + x(1 - \gamma)} + \beta > \gamma, \quad (1.6.6)$$

when she observes T_L , and re-elects if

$$\frac{q\gamma}{q + (1 - x)(1 - q)(1 - \gamma)} + \beta > \gamma, \quad (1.6.7)$$

when observes T_H . If $x = 0$, we can rewrite equation (1.6.7) to obtain the equilibrium value of β , that is

$$\beta > \gamma \left(1 - \frac{q}{(1 - \gamma)(1 - q) + q} \right), \quad (1.6.8)$$

as required. Remember from Lemma (2) that inequality (1.6.6) holds if $\beta > 0$. Thus, the voter is better off by re electing if observe a policy T_L or T_H if and only if

$$\beta > \gamma \left(1 - \frac{q}{(1 - \gamma)(1 - q) + q} \right) > 0. \quad (1.6.9)$$

Thus, the strategy profile $(0, 1, 1)$ is a PBE Nash equilibria. \square

Proof of Lemma 3.

Proof. Suppose the voter observes a tax T_L in both jurisdictions. The voter in jurisdiction r update her beliefs using Bayes' Rule; that is

$$\mu_L^L(x^r, x^c) = \frac{\Pr\{T_L^r, T_L^c | G\} \Pr\{G\}}{\Pr\{T_L^r, T_L^c | G\} \Pr\{G\} + \Pr\{T_L^r, T_L^c | B\} \Pr\{B\}},$$

where $\Pr\{T_L^r, T_L^c | G\} = \Pr\{T_L^r, T_L^c | G, H\} \Pr\{H\} + \Pr\{T_L^r, T_L^c | G, L\} \Pr\{L\}$ is the probability of observing a tax T_L in both jurisdiction given that her incumbent is good. The probability of observing a tax T_L in both jurisdictions given the incumbent is bad is $\Pr\{T_L^r, T_L^c | B\} = \Pr\{T_L^r, T_L^c | B, H\} \Pr\{H\} + \Pr\{T_L^r, T_L^c | B, L\} \Pr\{L\}$. As $\Pr\{T_L^r, T_L^c | G\} = [\gamma + (1 - \gamma)x^c](1 - q)$

and $\Pr\{T_L^r, T_L^c|B\} = x^r[\gamma + (1 - \gamma)x^c](1 - q)$, or equivalently,

$$\mu_L^L(x^r, x^c) = \frac{\gamma}{\gamma + x^r(1 - \gamma)} = \mu_L^L(x^r) .$$

Similarly, now suppose the jurisdiction- r voter observes a tax T_L in her jurisdiction and tax T_H in neighbour jurisdiction. Then, the voter's belief is

$$\mu_H^L(x^r, x^c) = \frac{\Pr\{T_L^r, T_H^c|G\} \Pr\{G\}}{\Pr\{T_L^r, T_H^c|G\} \Pr\{G\} + \Pr\{T_L^r, T_H^c|B\} \Pr\{B\}} ,$$

where $\Pr\{T_L^r, T_H^c|G\} = \Pr\{T_L^r, T_H^c|G, H\} \Pr\{H\} + \Pr\{T_L^r, T_H^c|G, L\} \Pr\{L\}$ is the probability of observing a tax T_L in jurisdiction r and a tax T_H in jurisdiction c given that incumbent is good. The probability of observing a tax T_L in jurisdiction r and a tax T_H in jurisdiction c given that the incumbent is bad is $\Pr\{T_L^r, T_H^c|B\} = \Pr\{T_L^r, T_H^c|B, H\} \Pr\{H\} + \Pr\{T_L^r, T_H^c|B, L\} \Pr\{L\}$. As $\Pr\{T_L^r, T_H^c|G\} = (1 - \gamma)(1 - x^c)(1 - q)$ and $\Pr\{T_L^r, T_H^c|B\} = x^r(1 - \gamma)(1 - x^c)(1 - q)$, or equivalently,

$$\mu_H^L(x^r, x^c) = \frac{\gamma}{\gamma + x^r(1 - \gamma)} = \mu_{LH}(x^r) .$$

Likewise, now suppose the jurisdiction- r voter observes a tax T_H in her jurisdiction and tax T_L in neighbour jurisdiction. Hence, the voter's belief is

$$\mu_L^H(x^r, x^c) = \frac{\Pr\{T_H^r, T_L^c|G\} \Pr\{G\}}{\Pr\{T_H^r, T_L^c|G\} \Pr\{G\} + \Pr\{T_H^r, T_L^c|B\} \Pr\{B\}} ,$$

where $\Pr\{T_H^r, T_L^c|G\} = \Pr\{T_H^r, T_L^c|G, H\} \Pr\{H\} + \Pr\{T_H^r, T_L^c|G, L\} \Pr\{L\}$ is the probability of observe a tax T_H in jurisdiction r and a tax T_L in jurisdiction c given that incumbent is good. Notice that $\Pr\{T_H^r, T_L^c|G\} = 0$. Hence, $\mu_L^H(x^r, x^c) = 0$. Finally, suppose the voter

observes a tax T_H in both jurisdictions. Then the voter's belief is

$$\mu_H^H(x^r, x^c) = \frac{\Pr\{T_H^r, T_H^c|G\} \Pr\{G\}}{\Pr\{T_H^r, T_H^c|G\} \Pr\{G\} + \Pr\{T_H^r, T_H^c|B\} \Pr\{B\}} ,$$

where $\Pr\{T_H^r, T_H^c|G\} = \Pr\{T_H^r, T_H^c|G, H\} \Pr\{H\} + \Pr\{T_H^r, T_H^c|G, L\} \Pr\{L\}$ is the probability of observe a tax T_H in both jurisdiction given that her incumbent is good. The probability of observing a tax T_L in both jurisdictions given the incumbent is bad is $\Pr\{T_H^r, T_H^c|B\} = \Pr\{T_H^r, T_H^c|B, H\} \Pr\{H\} + \Pr\{T_H^r, T_H^c|B, L\} \Pr\{L\}$. As $\Pr\{T_H^r, T_H^c|G\} = q$ and $\Pr\{T_H^r, T_H^c|B\} = q + (1 - x^r)(1 - \gamma)(1 - x^c)(1 - q)$, or equivalently,

$$\mu_H^H(x^r, x^c) = \frac{q\gamma}{q + (1 - x^r)(1 - x^c)(1 - q)(1 - \gamma)^2} .$$

□

Proof of Proposition 2.

Proof. First, let us prove the existence of the equilibria. Recall from Lemma 4 that $y_L^L = y_H^L = 1$ and $y_L^H = 0$. Therefore, we only need to prove x^r and y_H^H . In this case, jurisdiction- r incumbent is indifferent if $\Delta_2 = \Delta_1 + \Delta_2[y_H^H(1 - x^c) + y_L^H x^c]$. If $y_L^H = 0$, then this equality can be rewritten as

$$y_H^H = \frac{(\Delta_2 - \Delta_1)(\gamma - \beta)(1 - q)(1 - \gamma)^2}{\Delta_2 \beta q} ,$$

to obtain the value of y_H^H in equilibrium. Also, jurisdiction- r voter is indifferent between re-electing and not re-electing when observes tax T_H in both jurisdictions if

$$\frac{q\gamma}{q + (1 - x^r)(1 - x^c)(1 - q)(1 - \gamma)^2} + \beta = \gamma . \quad (1.6.10)$$

This equation can be rewritten as

$$x^r = 1 - \frac{\beta q}{(\gamma - \beta)(1 - x^c)(1 - q)(1 - \gamma)^2} . \quad (1.6.11)$$

Analogously, for x^c and combining it with x^r , we can obtain

$$x^r = 1 - \sqrt{\frac{\beta q}{(\gamma - \beta)(1 - q)(1 - \gamma)^2}} \quad (1.6.12)$$

Hence, jurisdiction- r incumbent is indifferent in equilibrium between setting T_L or T_H . Moreover, we need to verify that $x^r \in [0, 1]$. Considering equation (1.6.12), we have that

$$\frac{\partial x^r}{\partial \beta} = -\frac{q\gamma}{2(1 - q)(1 - \gamma)\sqrt{\frac{\beta q}{(1 - q)(1 - \gamma)(\gamma - \beta)}}(\gamma - \beta)^2} < 0$$

Thus, x^r is decreasing in β . Hence, $x^r > 0$ if

$$\beta < \gamma\left(1 - \frac{q}{q + (1 - q)(1 - \gamma)^2}\right), \quad (1.6.13)$$

which is obtained from combining equation (1.6.11) and (1.6.12). This proves that, if equation (1.6.13) holds, then $x^r > 0$. Notice that the equilibrium is unique because when $x^r = 0$ then it must be the case that $\beta = \gamma\left(1 - \frac{q}{q + (1 - q)(1 - \gamma)^2}\right)$, which clearly violates the equilibrium conditions. In addition, voter cannot re-elect if observes T_H in both jurisdictions under $\beta < \gamma\left(1 - \frac{q}{q + (1 - q)(1 - \gamma)^2}\right)$ since

$$\frac{q\gamma}{q + (1 - x^r)(1 - x^c)(1 - q)(1 - \gamma)^2} + \beta < \gamma.$$

Hence, there is no equilibrium in which the voter is indifferent and incumbent sets policy T_H , and there is no equilibrium in which voter re-elects under proposed conditions. Now we need to verify that $x^r < 1$. Simply observe from (1.6.12) that

$$-\frac{q\gamma}{2(1 - q)(1 - \gamma)\sqrt{\frac{\beta q}{(1 - q)(1 - \gamma)(\gamma - \beta)}}(\gamma - \beta)^2},$$

is always negative. Therefore, $x^r < 1$. This completes the proof of the first part of Proposi-

tion 2. Now let consider when $\beta > \gamma(1 - \frac{q}{q+(1-q)(1-\gamma)^2})$. In this case, the voter is willing to re-elect if observes a tax T_H in both jurisdictions if

$$\frac{q\gamma}{q + (1 - x^r)(1 - x^c)(1 - q)(1 - \gamma)^2} + \beta > \gamma . \quad (1.6.14)$$

To prove that this inequality always holds, simply observe that LHS is always strictly greater than γ , for all $x^r \in [0, 1]$. Hence, $y_H^H = 1$. Now let us check incumbent's strategies. jurisdiction- r incumbent sets a tax T_H if $\Delta_2 < \Delta_1 + \Delta_2 y_H^H (1 - x^c)$. This inequality clearly holds since $y_H^H = 1$ and $x^c = 0$. Therefore, $\Delta_2 < \Delta_1 + \Delta_2$ and incumbent sets $x^r = 0$. This completes the proof of Proposition 2. \square

Proof of Lemma 5.

Proof. First, let us prove the case where voter observes a tax T_L . Since, $\mu_{LL}^L = \mu_{HL}^L = \mu_{LH}^L = \mu_{HH}^L$, we only prove one of the four possible scenarios. Suppose jurisdiction- c voter observes a tax T_L in all jurisdictions. The voter in jurisdiction c update her beliefs using Bayes' Rule; that is

$$\mu_{LL}^L(x^\ell, x^r) = \frac{\Pr\{T_L^l, T_L^c, T_L^r | G\} \Pr\{G\}}{\Pr\{T_L^l, T_L^c, T_L^r | G\} \Pr\{G\} + \Pr\{T_L^l, T_L^c, T_L^r | B\} \Pr\{B\}} ,$$

where $\Pr\{T_L^l, T_L^c, T_L^r | G\} = \Pr\{T_L^l, T_L^c, T_L^r | G, H\} \Pr\{H\} + \Pr\{T_L^l, T_L^c, T_L^r | G, L\} \Pr\{L\}$ is the probability of observing a tax T_L in all jurisdictions given that her incumbent is good.

The probability of observing a tax T_L in all jurisdictions given the incumbent is bad is

$$\Pr\{T_L^l, T_L^c, T_L^r | B\} = \Pr\{T_L^l, T_L^c, T_L^r | B, H\} \Pr\{H\} + \Pr\{T_L^l, T_L^c, T_L^r | B, L\} \Pr\{L\} .$$

As $\Pr\{T_L^l, T_L^c, T_L^r | G\} = [\gamma + (1 - \gamma)x^\ell][\gamma + (1 - \gamma)x^r](1 - q)$ and $\Pr\{T_L^l, T_L^c, T_L^r | B\} = x^c[\gamma + (1 - \gamma)x^\ell][\gamma + (1 - \gamma)x^r](1 - q)$,

or equivalently,

$$\mu_{LL}^L(x^c) = \frac{\gamma}{\gamma + x^c(1 - \gamma)} .$$

Now let us prove the cases where the voter observes a tax T_H in her jurisdiction. Suppose

jurisdiction- c observes a tax T_H in her jurisdiction and low tax in other jurisdictions. Hence, jurisdiction- c voter's beliefs is

$$\mu_{LL}^H(x^\ell, x^r) = \frac{\Pr\{T_L^l, T_H^c, T_L^r|G\} \Pr\{G\}}{\Pr\{T_L^l, T_H^c, T_L^r|G\} \Pr\{G\} + \Pr\{T_L^l, T_H^c, T_L^r|B\} \Pr\{B\}} ,$$

where $\Pr\{T_L^l, T_H^c, T_L^r|G\} = \Pr\{T_L^l, T_H^c, T_L^r|G, H\} \Pr\{H\} + \Pr\{T_L^l, T_H^c, T_L^r|G, L\} \Pr\{L\}$ is the probability of observing a tax T_H in jurisdiction c , meanwhile, a tax T_H is observed in jurisdiction l and r , given that her incumbent is good. Notice that $\Pr\{T_L^l, T_H^c, T_L^r|G\} = 0$. Hence, $\mu_{LHL} = 0$.

In the same way, suppose now jurisdiction- c voter observes a tax T_H in her jurisdiction and in jurisdiction l , meanwhile, a tax T_L is observed in neighbouring jurisdiction r . The jurisdiction- c voter's beliefs is

$$\mu_{HL}^H = \frac{\Pr\{T_H^l, T_H^c, T_L^r|G\} \Pr\{G\}}{\Pr\{T_H^l, T_H^c, T_L^r|G\} \Pr\{G\} + \Pr\{T_H^l, T_H^c, T_L^r|B\} \Pr\{B\}} ,$$

where $\Pr\{T_H^l, T_H^c, T_L^r|G\} = \Pr\{T_H^l, T_H^c, T_L^r|G, H\} \Pr\{H\} + \Pr\{T_H^l, T_H^c, T_L^r|G, L\} \Pr\{L\}$ is the probability of observing a tax T_H in jurisdiction c and r , meanwhile, a tax T_L is observed in jurisdiction l , given that her incumbent is good. Notice that $\Pr\{T_H^l, T_H^c, T_L^r|G\} = 0$. Hence, $\mu_{HL}^H = 0$. By symmetry $\mu_{LHL}^H = 0$, which is the case when jurisdiction- c voter observes a tax T_H in her jurisdiction and in jurisdiction r , meanwhile, a tax T_L is observed in jurisdiction l .

Finally, suppose voter in jurisdiction c observes a tax T_H in all jurisdictions. Then, the updated voter's beliefs is

$$\mu_{HH}^H = \frac{\Pr\{T_H^l, T_H^c, T_H^r|G\} \Pr\{G\}}{\Pr\{T_H^l, T_H^c, T_H^r|G\} \Pr\{G\} + \Pr\{T_H^l, T_H^c, T_H^r|B\} \Pr\{B\}} ,$$

where $\Pr\{T_H^l, T_H^c, T_H^r|G\} = \Pr\{T_H^l, T_H^c, T_H^r|G, H\} \Pr\{H\} + \Pr\{T_H^l, T_H^c, T_H^r|G, L\} \Pr\{L\}$ is the probability of observing a tax T_H in all jurisdictions given that her incumbent is good. The probability of observing a tax T_H in all jurisdictions given the incumbent is bad is

$\Pr\{T_H^l, T_H^c, T_H^r|B\} = \Pr\{T_H^l, T_H^c, T_H^r|B, H\} \Pr\{H\} + \Pr\{T_H^l, T_H^c, T_H^r|B, L\} \Pr\{L\}$. As $\Pr\{T_H^l, T_H^c, T_H^r|G\} = q$ and $\Pr\{T_H^l, T_H^c, T_H^r|B\} = q + (1 - x^\ell)(1 - x^c)(1 - x^r)(1 - \gamma)(1 - q)$, or equivalently,

$$\mu_{HH}^H(x^r, x^c, x^\ell) = \frac{q\gamma}{q + (1 - x^\ell)(1 - x^c)(1 - x^r)(1 - \gamma)(1 - q)^3} .$$

□

This completes the proof of Lemma 5.

Proof of Proposition 3.

Proof. From Lemma (6), we know that $y_{LL}^L = y_{HL}^L = y_{LH}^L = y_{HH}^L = 1$ and $Y_{LL}^H = Y_{HL}^H = Y_{LH}^H = 0$. Therefore, we only need to prove the remaining strategy profile, that is, $(x^\ell, x^c, x^r, Y_{HH}^H)$.

In this case, jurisdiction- c incumbent is indifferent if

$$\Delta_2 = \Delta_1 + \Delta_2[y_{HH}^H(1 - x^\ell)(1 - x^r) + y_{LH}^H x^\ell(1 - x^r) + y_{HL}^H(1 - x^\ell)x^r + y_{LL}^H x^\ell x^r] .$$

By symmetry $x^\ell = x^r$ and from Lemma (6), the equation above can be rewritten as

$$y_{HH}^H = \frac{\Delta_2 - \Delta_1}{\Delta_2 \sqrt[3]{\frac{\beta q}{(\gamma - \beta)(1 - q)(1 - \gamma)^3}}} ,$$

to obtain the value of y_{HH}^H in equilibrium. Moreover, jurisdiction- c voter is indifferent between re-electing and not re-electing when observes a tax T_H in all jurisdictions if

$$\frac{q\gamma}{q + (1 - x^\ell)(1 - x^r)(1 - x^c)(1 - q)(1 - \gamma)^3} + \beta = \gamma . \quad (1.6.15)$$

Combining, x^c with x^ℓ , this equation can be rewritten as

$$x^c = 1 - \frac{\beta q}{(\gamma - \beta)(1 - q)(1 - x)^2(1 - \gamma)^3} . \quad (1.6.16)$$

Hence, jurisdiction- c incumbent is indifferent in equilibrium between setting T_L or T_H . More-

over, we need to verify that $x^c \in [0, 1]$. Considering equation (1.6.16), we have that

$$\frac{\partial x^c}{\partial \beta} = \frac{-q\gamma}{(\gamma - 1)^3(\beta - \gamma)^2(q - 1)(x - 1)^2} < 0$$

Thus, x^c is decreasing in β . Hence, $x^c > 0$ if

$$\beta < \gamma \left(1 - \frac{q}{q + (1 - q)(1 - \gamma)^3} \right), \quad (1.6.17)$$

which is obtained from combining equation (1.6.15) and (1.6.16). This proves that, if equation (1.6.17) holds, then $x^c > 0$. Notice that, when $x^c = 0$ then it must be the case that $\beta = \gamma \left(1 - \frac{q}{q + (1 - q)(1 - \gamma)^3} \right)$, which clearly violates the statement. Hence, there is no equilibria in which the jurisdiction- c voter is indifferent and jurisdiction- c incumbent sets a policy T_H under the proposed conditions. Moreover, since

$$\beta < \gamma \left(1 - \frac{q}{q + (1 - q)(1 - \gamma)^3} \right)$$

there is no incentive for jurisdiction- c voter to re-elect because

$$\frac{q\gamma}{q + (1 - x^\ell)(1 - x^r)(1 - x^e)(1 - q)(1 - \gamma)^3} + \beta < \gamma,$$

when β is sufficiently low. Therefore, this is a unique equilibrium. Now we need to verify that $x^c < 1$. Simply observe from (1.6) that

$$-\frac{3q\gamma}{2(1 - q)(1 - \gamma) \sqrt{\frac{\beta q}{(1 - q)(1 - \gamma)(\gamma - \beta)(\gamma - \beta)^2}}},$$

is always negative. Therefore, $x^c < 1$. To complete the proof, recall from the two-jurisdiction

model that

$$x^\ell = x^r = 1 - \sqrt{\frac{\beta q}{(\gamma - \beta)(1 - q)(1 - \gamma)^2}} .$$

Hence, the left/right jurisdiction incumbent is indifferent between setting a tax T_H and tax T_L . This proves the first part of Proposition 3 . Now lets consider when $\beta > \gamma(1 - \frac{q}{q + (1 - q)(1 - \gamma)^3})$. In this case, jurisdiction- c voter re-elects if observes a tax T_H in all jurisdictions if

$$\frac{q\gamma}{q + (1 - x^\ell)(1 - x^r)(1 - x^c)(1 - q)(1 - \gamma)^3} + \beta > \gamma .$$

To prove that this inequality always holds, simply observe that LHS is always strictly greater than γ , for all $x^\ell, x^r \in [0, 1]^2$. Hence, $y_{HH}^H = 1$. Now lets check jurisdiction- c incumbent strategies. jurisdiction- c incumbent sets a tax T_H if

$$\Delta_2 < \Delta_1 + \Delta_2[y_{HH}^H(1 - x^\ell)(1 - x^r) + y_{LH}^H x^\ell(1 - x^r) + y_{HL}^H(1 - x^\ell)x^r] .$$

This inequality clearly holds, since $y_{LH}^H = y_{HL}^H = 0$, $x^\ell = x^r = 0$ and $y_{HH}^H = 1$. Therefore, $\Delta_2 < \Delta_1 + \Delta_2$ and jurisdiction- c incumbent sets $x^c = 0$. This completes the proof of Proposition 3. □

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Chapter 2

Journalism and candidate self-selection across governments levels

José Antonio Carrillo-Viramontes

Abstract

The model is a novel attempt to analyse the effects of a watchdog journalist on candidate selection at both local and national levels of government. Specifically, this paper studies how the self-selection of bad (good) candidates to local and national level is affected by the journalist's reports and the rewards for being elected at the local or national office. To do so, I develop a simple game-theoretical model in which candidates who differ in quality and ability choose to run either locally or nationally, and a journalist chooses to investigate bad candidates at local or national level. I show that increasing the scandal cost of being exposed in a journalist report, does not deter bad candidates from running nationally (when the reward ratio is large enough). Indeed, it only makes that both, bad and good candidates to be distributed evenly across levels of government. Also, I found that when the reward ratio is on a specific range, increasing the scandal cost for being exposed in a journalist report creates only two opposite equilibria: one in which a bad candidate runs locally, whereas in the other one a good candidate runs locally. Moreover, I found a non-monotonic relationship between the probability of a bad candidate being elected at a local level and the reward ratio.

Keywords: Candidate self-selection, journalist, corruption, national and local elections.

JEL Classification Numbers: D72, C79, H79.

2.1 Introduction

Throughout history, the biggest political scandals have been discovered with the help of journalists. In many cases, journalists have played an efficient watchdog role by investigating and reporting corruption, wrongdoing, etc. Real-world examples abound. The “Watergate affair” in which the coverage from two Washington Post reporters about a break-in into the headquarters of the Democratic National Committee, was crucial in culminating in the first presidential resignation in the history of the United States. In 2015, five journalists received an international award for an investigation on the then president of Mexico regarding an undeclared donation of a mansion, leading to a public apology from the Mexican president and the return of the mansion. More recently, the “Operation Car Wash” in Brazil led to a 15-year conviction of the former president of the chambers of deputies, after an intense pressure of media investigations.

These examples suggest that journalists promote scrutiny towards politicians. However, media scrutiny might be unbalanced. For example, candidates at national levels face higher levels of scrutiny ([Jamieson and Waldman, 2004](#)). One reason is that TV stations tend to cover state and national politicians such as senators, governors and the president relatively more than local politicians ([Prat and Strömberg \(2011\)](#)). Another reason is that monitoring and auditing are usually better developed at national than at local level ([Prud’Homme, 1995](#)).

Similarly, there is evidence of how media coverage is unbalanced across levels of government. For example, [Costas-Pérez *et al.* \(2012\)](#) analyse how the availability of information about corruption scandals through newspapers in Spain affects electoral outcomes. They found that regional and national media coverage has a greater impact on the probability of re-election of a politician involved in a corruption scandal, than local news. The unbalanced media scrutiny across governmental levels makes an office more or less attractive for candidates.

Moreover, the relative importance of ego rents and financial incentives may well change

depending on the level of government ([Mattozzi and Merlo, 2015](#)). Political candidates have to consider the benefits of running as a candidate for a local or a national office against the costs of such media scrutiny.

The interaction between politicians and journalists is characterized by a conflict of interests. For a journalist, a “good” story is what in the eyes of a politician is a “bad” story ([Örebro, 2002](#)). Moreover, the relationship between politicians and journalists has become increasingly antagonistic ([VanHeerde-Hudson, 2014](#)). One reason for this is that investigative journalists have an incentive to actively uncover corrupt scandals since producing shocking news and stories can lead to a successful career, ([Zaller, 1999](#)).

The aim of this paper is to analyse the effects of a journalist on the distribution of candidates across levels of government; specifically, how bad (good) candidates self-select to local or national office anticipating the journalist’s decision to investigate at local or national level.

To do so, I develop a simple game-theoretical model in which four candidates choose to run either locally or nationally, and the journalist chooses to investigate at a local or national level. Candidates are of two types: good or bad. Moreover, candidates’ decisions are driven by the relative difference between rewards across levels, and in the case of bad candidates, by the potential scandal cost imposed by journalist’s report. Hence, the pool of candidates across levels is endogenously determined, and the journalist’s decision affects both the pool of candidates and the distribution of good and bad candidates across levels of government. The model is a novel attempt to analyse the effects of a watchdog journalist on political selection at both local and national levels of government.

The model yields several insights. First, increasing the scandal cost for being exposed in a journalist report does not deter bad candidates from running nationally (when the reward ratio is large enough); it only makes that both, bad and good candidates are distributed evenly across levels of government. Second, when the reward ratio is on a specific range, increasing the scandal cost for being exposed in a journalist report creates only two opposite

equilibria. In the first equilibrium, a single bad candidate runs locally, whereas in the other equilibrium only a single good candidate runs locally. Another interesting result is that there is a non-monotonic relationship between the probability of a bad candidate being elected at a local level and the reward ratio. A priori, a higher payoff at the local level will make the office more attractive for bad candidates. However, the effect is ambiguous since good candidates are also attracted to local office. This creates incentives for bad candidates to run nationally as well.

This study is related to the theoretical literature that analyses candidate self-selection according to their quality and ability.¹ For example, [Caselli and Morelli \(2004\)](#) analyse the reasons why some countries have better politicians, and why even in democratic systems, bad politicians emerge. They identify three main channels that can explain the existence of bad politicians.

The first is that low-quality politicians have a comparative advantage when they run for office. The reason is they have a lower opportunity cost. Second the existence of multiple equilibria regarding the quality of the politicians in office. Third, they show that there can be a path dependence on the quality of elected officials. Unlike their work, I analyse candidate self-selection into local and national offices according to their quality and ability, but taking into account how low quality (bad) candidates anticipate media scrutiny from a journalist.²

Similarly, [Bernheim and Kartik \(2014\)](#) theoretically study the characteristics of self-selected candidates in corrupt political systems, taking into account unobservable traits such as public spirit and honesty. These unobservable characteristics create a trade-off between benefits and costs of the quality of governance and welfare. Moreover, they analyse the effects of compensation and anti-corruption enforcement. Their main finding is that candidates who are dishonest are the ones with the greatest incentive to run for an office. Even though their work is related to the one presented here, they do not study the effects of the office rewards

¹ See, [Messner and Polborn \(2004\)](#), [Mattozzi and Merlo \(2015\)](#), and [Poutvaara and Takalo \(2007\)](#).

² Among the few papers analysing the interaction between politicians and journalists, is [Eraslan and Ozerturk \(2017\)](#). However, their approach is focused on the access to information sources rather than candidate self-selection.

across levels of government nor the effect of media scrutiny from a journalist, which is a key feature in this paper.

The effect of media scrutiny on political accountability has also been studied. In particular, attention has been devoted to the study of bias and/or capture of the mass media, and under what conditions this bias/capture can influence voters welfare and ultimately policy outcomes (see for example [Strömberg \(2015\)](#), [Snyder and Strömberg \(2010\)](#), [Besley *et al.* \(2002\)](#), and [Puglisi and Snyder \(2008\)](#)). In particular, [Strömberg \(2015\)](#) identify two roles of mass media in elections. One in which media provide relevant information to voters about candidates, and as a consequence, the political selection is improved. The other role is less positive. They suggest that media might create a systematic bias by exploiting cognitive mistakes on voters.

Another strand of the literature analyses candidate selection according to the relationship between quality and salaries.³ For example, [Messner and Polborn \(2004\)](#), [Fisman *et al.* \(2014\)](#), and [Gagliarducci and Nannicini \(2013\)](#) analyse how the salary for being in office in comparison to the salary outside the political arena can affect both the decision to run for office and the quality of the pool of candidates. Most of these studies find that the lower the rewards for an office, the lower the quality of the possible candidates. In this paper, I analyse how rewards of local and national offices affect the pool and distribution of candidates, rather than the relationship between salaries and quality.

The rest of the paper is structured as follows. The next section describes the basic model. In section [2.3](#), equilibrium analysis is presented for different values of the rewards at office. Section [2.4](#) presents some comparative statics. In section [2.5](#), some implications from the model are presented. The next section shows some empirical evidence that resembles the theoretical model. Concluding remarks are presented in the last section.

³ Regarding non-pecuniary motives to stand for an office see [Callander \(2008\)](#) and [Besley \(2004\)](#).

2.2 Set-up

Consider a journalist (she), and four candidates. Candidates differ in quality or ability; I simplify by considering two types of candidates: “good” (G) or “bad” (B). Good candidates are public spirit oriented, whereas bad candidates are attracted by potential private rents. The number of good and bad candidates is equal, that is there are two good and two bad candidates; this is common knowledge. Therefore, the journalist observes candidates’ types.⁴

Each candidate has two options, either run for local or national office.⁵ Once candidates have decided where to run, they will compete in one of the two simultaneous elections, either at local level L or at national level N . The probability that a candidate wins an election is simply determined by the number of candidates running for the office, that is $\frac{1}{n}$, where n is the number of candidates running at each level.⁶

If nobody stands for an election at the local or national level, then an exogenous politician is appointed, with probability $\frac{1}{2}$ of being of type B .⁷ Given the candidates’ choices, the journalist has two options before an election, either investigate at local or national level.

Prior to the elections, the journalist (knowing the types of the candidates) observes the distribution of candidates across levels of government and chooses the level in which a bad candidate it is more likely to win the election, then she starts to investigate all bad candidates running in that level. In other words, she will start the investigation by looking for relevant evidence related to any of the bad candidates. As [Eraslan and Ozerturk \(2017\)](#) pointed out, candidates control the access to any relevant information, therefore the journalist will face restrictions to get information. As a result of this restriction, the journalist will have to look for leaks, clues, or perform private interviews, press briefings, and even to pay for crucial evidence. The probability of finding a truthful scandal evidence is represented by α . In other

⁴As mentioned in [Bennett \(2016\)](#), journalists have access, and receive information before the American people. Therefore, journalist are better informed than voters.

⁵For simplicity, we do not consider the case where candidates have the choice of not running.

⁶To simplify the analysis and to sharper results I consider an equal probability for a candidate to win the election. However, different factors can affect the probability of winning for example, popularity, ideology, etc.

⁷This is necessary to avoid trivial equilibria.

words, α is the probability of detection.

After the elections, if the journalist discovers crucial and truthful evidence of corruption about the bad candidate, she will create a report and publish it. This will reveal the politician's type to the public and the politician will pay a scandal cost $C > 0$. Those candidates whose level is not being investigated by the journalist will receive the same payoff regardless of their type. Let M_N be the payoff at the national level and M_L the payoff at local level. These rewards are not only monetary but also ego rents, power, prestige etc. In line with [Lessmann and Markwardt \(2010\)](#), working in central government provides more prestige and power to the agents involved than in local government. Therefore, the following assumption on payoffs is imposed: $M_N > M_L > 0$.

The payoff for being elected (without scandal for bad types) at a national office is higher than being elected in a local one. In general, this assumption implies that all candidates are *ceteris paribus* attracted by national office. The journalist has a payoff of $P > 0$, if she investigates and discloses a bad politician at national or local level. She gets a payoff of zero if she finds a good candidate, or she fails to discover a bad politician in office.

In line with [Fan *et al.* \(2009\)](#), journalists tend to devote more resources to monitor national governments since stakes are higher. Therefore, I assume that if the stakes are higher at the national level, the journalist will always choose to investigate nationally as a tie-breaking rule for having the same payoff at both levels. In order to capture the relative importance of both local and national office, I define $m = \frac{M_L}{M_N}$ as the reward ratio between local and national office, where $m \in (0, 1)$ since $M_N > M_L$. In other words, the higher the reward at local office, relative to the national office, the closer the reward ratio to one. On the contrary, the smaller the reward at the local office, relative to national office, the closer the ratio is to zero. I also define $c = \frac{C}{M_N}$ as the cost ratio, where $c \in (0, \infty)$, since there is no restriction on values of C in relation to M_N and M_L . In other words, a scandal cost can exceed the reward of being the representative at any level.

The model has the following stages. First, all candidates simultaneously make their

candidacy public, that is they choose to run for a local or national office. Once the journalist observes candidates' decisions, the journalist decides which level he is going to investigate. After that, the journalist starts investigating all bad candidates running at the chosen level, looking for any incriminating evidence. Elections take place, and elected politicians are appointed to their office. In the last stage, the journalist discovers the bad politician if she finds a scandal with probability α . The timing of the events is summarized as follows:

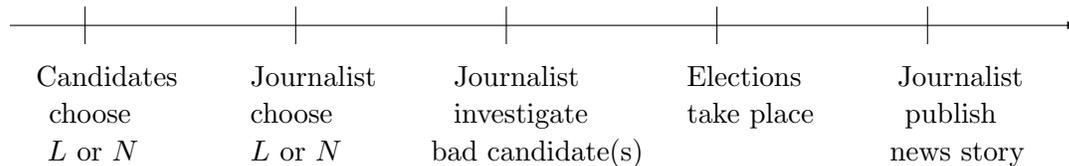


Figure 2.2.1: Timing

2.3 Equilibrium analysis

The equilibrium concept we employ is Subgame Perfect Nash equilibrium.⁸ Table 2.1 presents the possible types of equilibria. The first column indicates the number of candidates running nationally. The second column reports the number of candidates running locally. The last column is a label for the equilibrium type. Given the above, we can now analyse the existence of the possible equilibria. The following result states a unique SPE.

Proposition 4. *The local office is uncontested if and only if $m \in (0, \frac{1}{4}]$. The unique SPE is of type $(GGBB, \emptyset)$. In this equilibrium, the journalist investigates nationally.*

Proposition 4 shows that if the difference between the payoff at a national level M_N and the payoff at a local level M_L is sufficiently small such that $m < \frac{1}{4}$, then local office is uncontested.⁹ In other words, all candidates are better off by running nationally. The

⁸A Nash equilibrium is subgame-perfect if players' strategies constitute a Nash equilibrium in every subgame (Gibbons, 1992). Due to multiplicity, I focus on pure strategy equilibria only.

⁹An uncontested election is defined here as a situation in which the number of open seats is greater or equal to the number of candidates.

Table 2.1: Possible equilibria types

National	Local	Type
GGBB	\emptyset	$(GGBB, \emptyset)$
GGB	B	(GGB, B)
GBB	G	(GBB, G)
GB	GB	(GB, GB)
GG	BB	(GG, BB)
BB	GG	(BB, GG)
G	GGB	(G, GGB)
B	GGB	(B, GGB)
\emptyset	GGBB	$(\emptyset, GGBB)$

intuition behind is that the payoff M_N is large enough relative to M_L to attract all candidates to national office, even though bad politicians will be investigated with probability one and disclosed with probability α by the journalist. To sum up, in order for a local office to be contested, the reward ratio must be $m > \frac{1}{4}$.

Proposition 5. *The national office is contested for any possible combination of m , c and α .*

Proposition 5 shows that equilibria of type (G, GGB) , (B, GGB) and $(\emptyset, GGBB)$ cannot exist. Hence, national office is always contested: there are always at least two candidates running nationally. The reason is the following: in the outcome (G, GGB) , the good candidate running locally is better off by deviating and running nationally because half of M_N is always larger than a third of M_L , given the assumption $M_N > M_L$. Similarly, in the case of the outcome (B, GGB) , a good candidate running locally is better off by deviating and running nationally because a half of M_N is always larger than a third of M_L . In the strategy profile $(\emptyset, GGBB)$, a good candidate is better off deviating and running nationally since M_N is larger than a quarter of M_L .

2.3.1 Intermediate values of the ratio of rewards

The following result analyses the equilibria in which intermediate values of the rewards between government levels is $m \in \{\frac{1}{4}, \frac{2}{3}\}$.

Proposition 6. *If $m \in \{\frac{1}{4}, \frac{2}{3}\}$ then at any pure strategy equilibrium all local elections are unopposed. In particular, the following SPE exists:*

(i) *An equilibrium of type (GGB, B) if and only if $m \in [\frac{1}{4} + \frac{3}{4}c\alpha, \frac{2}{3}]$. In this equilibrium, the journalist investigates at local level.*

(ii) *An equilibrium of type (GBB, G) if and only if $m \in [\frac{1}{4}, \frac{2}{3}(1 - c\alpha)]$. In this equilibrium, the journalist investigates at national level.*

Proposition 6 shows that at any pure strategy equilibrium, all local elections are unopposed: in local elections, only one candidate runs if the reward ratio m is between a quarter and two-thirds. To see why, consider the equilibrium of type (GGB, B) . The expected payoff for any candidate running nationally is $\frac{1}{3}M_N$. In this case, good candidates are better off by running nationally since the payoff for being a representative of the national office is larger than the one for being at a local office ($\frac{1}{3}M_N$ is larger than $\frac{1}{2}M_L$). Similarly, the bad candidate is better off running nationally since the payoff for doing so is larger than the payoff for running locally because at the local level he will be investigated.

The case for the bad candidate running locally is different. If he decides to deviate and run nationally he will be investigated anyway, therefore, he is better off running locally since the payoff for being elected as a local representative is larger than the payoff for being elected at a national office, that is, $M_L - C\alpha$ is larger than $\frac{1}{4}(M_N - C\alpha)$. Given the candidates' strategies, the journalist is better off investigating locally since a bad candidate will be elected with probability one, whereas at the national level the probability of having a bad candidate elected is a third.

In the case of equilibrium (GBB, G) , all bad candidates are better off running nationally along with a good candidate, even though they will be investigated by the journalist if they win the national election. The reason is the following: the good candidate running nationally is better off by doing so since the payoff for being a representative of the national office is larger than the one for being at a local office, that is $\frac{1}{3}M_N$ is larger than $\frac{1}{2}M_L$.

Similarly, bad candidates are better off by doing so since the payoff for being a represen-

tative of the national office is larger than the one for being at a local office. Although bad candidates will pay the cost of being investigated at national, this cost is sufficiently small that they are better off at the national level. The journalist is better off by investigating nationally since there is no bad candidate running at the local level. For the good candidate running locally, deviating is not profitable since the payoff for being elected locally is larger than for being elected nationally, that is, M_L larger than $\frac{1}{4}M_N$.

This equilibrium, in particular at national level is similar to findings by [Messner and Polborn \(2004\)](#) and [Caselli and Morelli \(2004\)](#). They found that bad politicians (low quality in the case of [Caselli and Morelli \(2004\)](#)) are more likely to run for an office than good ones. However, their studies do not consider two levels of government and politicians can choose not to participate as candidates.

2.3.2 Large values of the ratio of rewards

The following results show the equilibria in which the payoffs at the national and local level are relatively similar, that is when the value of the rewards are large $m > \frac{2}{3}$.

Proposition 7. *If $m > \frac{2}{3}$ then at any pure strategy equilibrium both local and national offices are opposed. In particular, the following SPE exists:*

(i) *An equilibrium of type (GB, GB) if and only if $m \in [\frac{2}{3}, \min\{\frac{3}{2} - \frac{1}{2}c\alpha, 1\})$. In this equilibrium the journalist investigates at the national level.*

(ii) *An equilibrium of type (GG, BB) if and only if $m \in [\frac{2}{3} + c\alpha, 1)$. In this equilibrium the journalist investigates at the local level.*

(iii) *An equilibrium of type (BB, GG) if and only if $m \in [\frac{2}{3}, \min\{\frac{3}{2} - \frac{3}{2}c\alpha, 1\})$. In this equilibrium the journalist investigates at the national level.*

Proposition 7 shows that if the reward ratio m is larger than $\frac{2}{3}$ then in any pure strategy equilibrium in all elections two candidates always run at each office. To see why, consider first an equilibrium of type (GB, GB) and suppose that m is larger than $\frac{2}{3}$. In this case,

the good candidate running nationally is better off by doing so since the payoff for being in office at national level is larger than at local office, that is, $\frac{1}{2}M_N$ is larger than $\frac{1}{3}M_L$.

Similarly, the bad candidate is better off by running nationally. The reason is that he will be investigated by the journalist if he deviates anyway, therefore, his payoff for running nationally is $\frac{1}{2}(M_N - C\alpha)$, which is larger than $\frac{1}{3}(M_L - C\alpha)$. The journalist is better off by investigating nationally since stakes are higher; even though the expected payoff is the same in both levels.

At the local level both candidates have an expected payoff of $\frac{1}{2}M_L$. In the case of the good candidate, he is better off by running locally since the payoff is larger than the one running nationally, that is, $\frac{1}{2}M_L$ is larger than $\frac{1}{3}M_N$. Similarly, the bad candidate is better off running locally since running nationally will make him pay the costs of being investigated if he is elected. Therefore, the bad candidate payoff for running locally is larger than the payoff for running nationally, that is, $\frac{1}{2}M_L$ is larger than $\frac{1}{3}(M_N - C\alpha)$.

In the equilibrium of type (GG, BB) all good candidates run nationally, whereas bad ones run locally. The reason is that good candidates' payoff for being in office at the national level is larger than at the local office, that is, $\frac{1}{2}M_N$ is larger than $\frac{1}{3}M_L$. The case of the bad candidates running locally is different. Since they will be investigated by the journalist if they are elected, bad candidates have to pay the cost of being investigated.

Therefore, bad candidates are better off by running locally since the payoff for being elected at national office does not offset the costs of being investigated nor the payoff for being elected at local office: $\frac{1}{2}(M_L - C\alpha)$ is larger than $\frac{1}{3}M_N$. In this equilibrium, the journalist is better off by investigating locally since all bad candidates are running there.

Finally, in the equilibrium of type (BB, GG) all bad candidates will be concentrated nationally whereas good candidates will be at the local level. Given this, the journalist will investigate at the national level. The reason for bad candidates running nationally is that the payoff for being elected at local level is large enough to offset both the costs of being investigated and the payoff for running locally.

The case of the good candidates is different. They are better off running locally since the payoff for running locally is larger than the one for running nationally, that is, $\frac{1}{2}M_L$ is larger than $\frac{1}{3}M_N$.

2.4 Comparative statics

From the previous propositions, we can infer several insights about how the relative reward ratio m and the scandal ratio c affect the distribution of bad and good candidates across levels. Figure 2.4.1 represents the existence of multiple pure strategy Nash equilibria for parameters (m, c) . I divide Figure 2.4.1 into three segments: large values of the ratio of rewards $m > \frac{2}{3}$, intermediate values of the ratio of rewards $m \in [\frac{1}{4}, \frac{2}{3}]$, and small values of the ratio of rewards $m < \frac{1}{4}$.¹⁰ It is important to notice that the higher the reward at the local office, relative to the national office, the closer the reward ratio to one. On the contrary, the smaller the reward at local office, relative to national office, the closer the ratio is to zero.

2.4.1 Large values of the ratio of rewards: $m > \frac{2}{3}$

Suppose that $m > \frac{2}{3}$, such that the only possible equilibria are (GB, GB) , (GG, BB) and (BB, GG) (see Figure 2.4.1). If c increases sufficiently (keeping m constant) then the equilibria of the form (GG, BB) is no longer possible. To see why, consider the equilibrium of the form (GG, BB) . If the scandal cost ratio c increases, then bad candidates are worse off running locally since the payoff for being elected at a local office is not sufficient to offset the scandal cost ratio. Therefore, a bad candidate will deviate and run nationally thus rendering the equilibrium of type (GG, BB) no longer possible.

Similarly, suppose now that only possible equilibria are of type (GB, GB) and (BB, GG) . If c increases sufficiently (keeping m constant) then the equilibrium of the form (BB, GG) is no longer possible. To see why, consider the equilibrium of the form (BB, GG) . If the

¹⁰The journalist decision in equilibrium is represented by i in the equilibrium of the form (\cdot, \cdot) - i , where $i \in \{N, L\}$

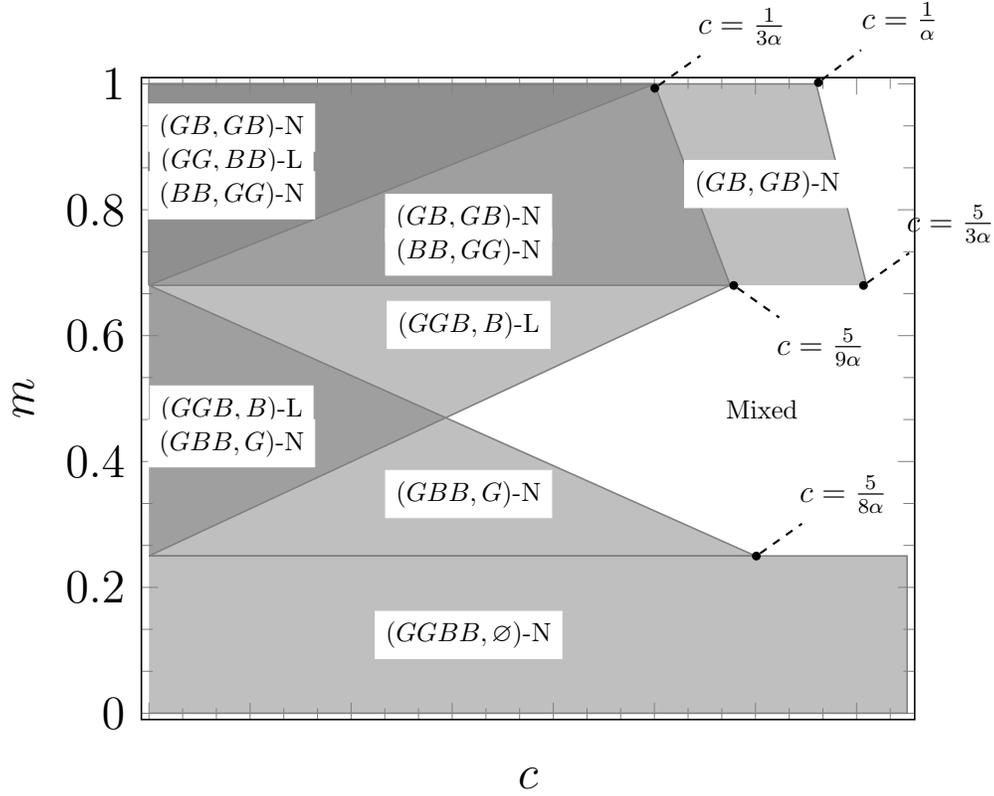


Figure 2.4.1: Existence of different pure strategy Subgame Perfect Nash equilibrium types as a function of (m, c) .

scandal cost ratio c increases, then bad candidates are worse off running nationally since being elected at the national office now entails a higher potential cost for being investigated. Therefore, the payoff for being elected at a local office is now more attractive since the journalist will not investigate locally. As a consequence, the equilibrium of type (BB, GG) is no longer possible since a bad candidate will deviate. To sum up, if the reward ratio m is larger than $\frac{2}{3}$, increasing the scandal cost ratio creates an even distribution of candidates types across levels of government in pure strategy equilibria.

2.4.2 Intermediate values of the ratio of rewards: $m \in \{\frac{1}{4}, \frac{2}{3}\}$

Now suppose that $m \in \{\frac{1}{4}, \frac{2}{3}\}$, such that the only possible equilibria are of type (GGB, B) and (GBB, G) (see Figure 2.4.1). If c increases sufficiently and keep m constant, then the equilibria of the form (GBB, G) is no longer possible. To see why, consider the equilibria

of the form (GBB, G) . Similar to what happens in the case of the equilibrium of the form (BB, GG) , if the scandal cost ratio c increases, then bad candidates are worse off running nationally since now being elected at the national office it entails a higher potential cost of being investigated. Therefore, the payoff for being elected at a local office is now more attractive since the journalist will not investigate locally. As a consequence, the equilibrium of type (GBB, G) is no longer possible since a bad candidate will deviate.

Similarly, suppose now that the only possible equilibria are of type (GGB, B) and (GBB, G) . If c increases sufficiently and keep m constant, then the equilibria of the form (GGB, B) is no longer possible. To see why consider the equilibria of the form (GGB, B) . Given that the scandal cost ratio c increases, the bad candidate running locally is now worse off since the cost of being investigated is larger. Therefore, running as a national candidate is now more attractive even though he will be investigated nationally anyway. As a consequence the equilibrium of type (GGB, B) is no longer possible since a bad candidate will deviate. To sum up, there are two opposite effects of the scandal cost ratio on the distribution of candidates across levels. On one hand, increasing the scandal cost creates an equilibrium in which only one bad candidate runs locally if the reward ratio is sufficiently close to $\frac{2}{3}$. On the contrary, increasing the scandal cost creates an equilibrium in which only one good candidate runs locally if the reward ratio is sufficiently close to $\frac{1}{4}$.

2.5 Implications

2.5.1 Probability of detection and scandal cost

Let me analyse how the probability of getting caught α affects the equilibrium area. To do so, observe figure 2.4.1 and suppose that α is close to one. In this case, a higher probability of being caught will decrease the equilibrium value of c . Hence, the area of all equilibria will be reduced. For example, the equilibrium (GGB, B) -L area has a vertex of $c = \frac{5}{9\alpha}$. If α increases then the area in which the equilibrium of the form (GGB, B) -L can exist is

reduced. On the other hand, if $\alpha \rightarrow 0$, the c will increase. Hence, the area of all equilibria will be expanded. Thus, higher probability of detection makes mixed equilibria more likely to exist, whereas the probability of having a pure strategy equilibria will decrease.

Similar to α , the scandal cost c affect the set of possible equilibria by reducing its area when the scandal cost is small, and increasing the area when the scandal cost is large. Thus, the higher the cost for a bad politician to be involved in a corruption activity the larger the area of the equilibrium given the rewards at the local and national office. In [VanHeerde-Hudson \(2014\)](#), a detailed evidence of electoral consequences of a scandal is presented. Countries like Italy, the U.S., the U.K., and Sweden have experienced cases of their incumbent politicians being involved in corruption, sex, or abuse of power scandals, and still being re-elected for public offices. For example, [VanHeerde-Hudson \(2014\)](#) mention that in Japan, 60% of legislators were convicted of corruption in the post-war period, but they were subsequently re-elected. This empirical evidence could be interpreted as a small ratio c in our model, in which a scandal cost represents a small penalty, relative to the reward from being elected.

2.5.2 Number of candidates

Another interesting insight is that the number of candidates running nationally is decreasing in m . As we can see from figure [2.4.1](#), if $m < \frac{1}{4}$ then the number of candidates running nationally is four. If $m \in \{\frac{1}{4}, \frac{2}{3}\}$, the number of candidates running nationally decreases by one. Finally, if $m > \frac{2}{3}$, the number of candidates running nationally is two. This can explain why national elections are more competitive in comparison to local ones. Related to this, [Bernheim and Kartik \(2014\)](#) found that the larger the number of candidates competing in an election the lower the quality of candidates. Their result is mainly driven by governors' compensation and anti-corruption enforcement. In my model, this is not necessarily true. The reason is that here candidates have two options for being in office, the national and local level.

A priori all candidates regardless their type are attracted by national office due to the assumption $M_N > M_L$. However, bad candidates can deviate and run locally in order to avoid being investigated by the journalist and to maximize their expected profits. Given this, the number of candidates does not necessarily imply a better pool of candidates. For example, the equilibria of type (GGB, G) and (GBB, B) , have the same numbers of candidates but the composition of the pool is significantly different. The main driving forces of these equilibria are the relative payoff m , the relative cost c , and the strategy of the journalist.

2.5.3 Selection effect

Now I analyse how the relative difference in payoffs between the local and national level, and the scandal cost affects the probability that a bad candidate can be elected at the local and national levels. Figure 2.5.1 illustrates the probability that a bad candidate can be elected at the national and local level in each equilibrium respectively.

As we can observe from Figure 2.5.1, the highest probability of getting a bad candidate elected at the national level is on the equilibrium of type (BB, GG) -N. In this equilibrium, the probability of a bad candidate being elected at the national level is one, whereas the probability of a bad candidate elected at the local is zero, $(1, 0)$. On the contrary, the lowest probability of having a bad candidate elected at the national level is in the equilibrium of type (GG, BB) . In this equilibrium, the probability of having a bad candidate elected at the national level is zero, whereas the probability of having elected a bad candidate at the local level is one, $(0, 1)$. All these equilibria can only exist when the relative rewards of office m are larger than two-thirds.

When the reward ratio m is between two-thirds and a quarter, the highest probability for a bad candidate being elected at the national level is in the equilibrium of type (GBB, G) . In this equilibrium, the probability of having a bad politician elected at the national level is two-thirds, whereas the probability of a bad politician elected at the local office is zero, $(\frac{2}{3}, 0)$. On the contrary, the lowest probability of having a bad politician elected at national

level is in the equilibrium of type (GGB, B) . In this equilibrium, the probability of having a bad politician elected at the national level is a third, whereas the probability of having a bad politician elected at the local level is one, $(\frac{1}{3}, 1)$.

An interesting insight from Figure 2.5.1 is the non-monotonic relationship between the probability of having a bad candidate elected at the local level and the values of the reward ratio m . The probability of having a bad candidate elected at the local level is increasing in m until the reward ratio hit the point $\frac{2}{3}$. After that point, that is when m is larger than $\frac{2}{3}$, the probability of having a bad candidate elected drops to zero for the equilibrium of type (BB, GG) , and to a half on the equilibrium of type (GB, GB) . There are two opposite driving forces in this result. First, the higher the reward ratio m , the higher the payoff for being elected at a local office. Hence, running locally is more attractive for bad candidates if m increases. Second, the number of candidates running locally increases because also good candidates are attracted to local office. Hence, running nationally is attractive for bad candidates if good candidates run locally.

2.6 Empirical predictions

This section presents a number of implications from the theoretical model; in particular, how the theoretical results are consistent with some empirical evidence.

The effect of rewards on the number of candidates. Proposition 5 states that all candidates run nationally and local election is unopposed when the payoff for being in national office is extremely large in comparison to the payoff from a local office. This prediction is similar to the findings of Marschall and Lappie (2016).¹¹ They report a positive linear relationship between the level of compensation and the supply of mayoral candidates in California for the period 1995-2014, and also a negative relationship between the level of compensation and the percentage of unopposed candidates. Marschall and Lappie (2016)

¹¹Although, their findings are intra-state level, the model presented here can be applied to lower levels of government as long as $M_N > M_L$ holds.

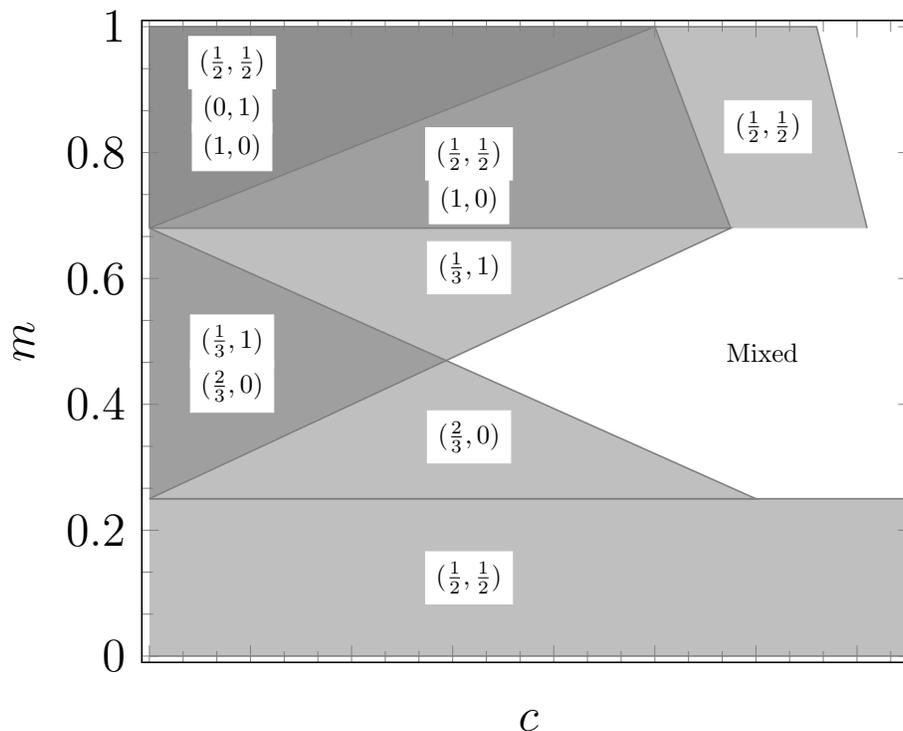


Figure 2.5.1: Selection effect: Probability that a bad candidate is elected at a national and local level (N,L)

agree that being in a mayor's office in a large city tends to be more prestigious and better compensated, compared to smaller cities. In this case, the larger the payoff for office, the less likely the office will be uncontested.

Corruption across levels. As we have seen from the model, expected corruption can be found in both local and/or national levels depending on the size of the rewards at the local level (relative to national level), the scandal cost, the probability of detection, and the journalist's strategy. At the local level, Ferraz and Finan (2011) analyse empirical evidence in Brazil using the presence of local media and judiciary agents as a measure of detection for corrupt practices. This variable is similar to the probability of detection in my model. Consistent with my findings, they report lower corruption in places with a higher probability of detection. Their evidence suggests that municipalities in Brazil with a higher presence of local media and judiciary agents can be in an equilibrium of type (GBB, G) whereas those with a lower presence of local media and judiciary agents are in an equilibrium of type

(GGB, B) .

At the national level, evidence of corruption in Latin America governments has been notorious. As [Canache and Allison \(2005\)](#) pointed out, corruption scandals have emerged in many Latin America governments in the 90's. For example, in Brazil, Venezuela, and Ecuador, presidents have been forced to resign, suspended or triggered a political process on them due to public evidence of corruption. These examples are consistent with equilibria of type (BB, GG) and (GGB, G) .

Moreover, in order to analyse the effect of rewards across levels of governments into political corruption, I compute a proxy for the reward ratio m and compare it against the number of corruption convictions used in [Maxwell and Winters \(2005\)](#). The reward ratio m is computed with data from the Book of the States, provided by the Council of the U.S. State Governments. In the Book of the States, the governor compensation (salary) for each state in the U.S. is provided for the year 2000.¹² The salary of the president of the U.S. is public information.¹³

To compute m , I divide the salary of a governor by the salary of the president. It is important to notice that the main assumption of the theoretical model, that is $M_N > M_L$ is not violated, therefore the comparison of m using the state and national levels is useful. For the corruption measure, I use [Maxwell and Winters \(2005\)](#) corruption variable, the average log of the number of corrupt officials per thousand officials elected for the period 1987-2000 for each state. As we can see from [Figure 2.6.1](#), there is a positive correlation between m and the number of corrupt officials for the U.S. states. This empirical evidence is similar to my theoretical findings, specifically to equilibria of type (BB, GG) and (GGB, G) .

¹²<http://knowledgecenter.csg.org/kc/category/content-type/bos-2000-2001>

¹³Since 2001, the salary for the president without any extra expenses is \$400,000 dollars per year.

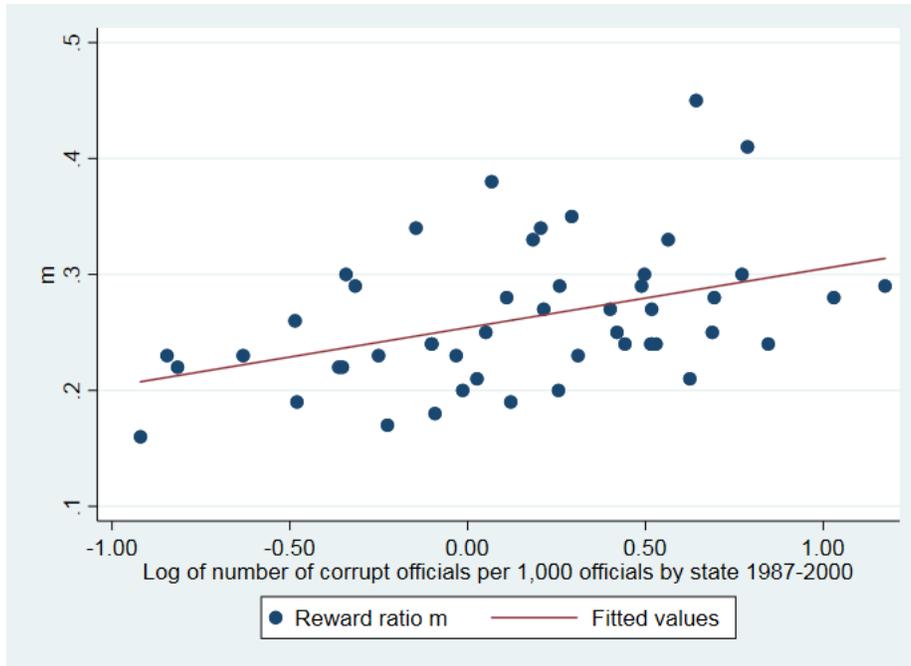


Figure 2.6.1: Reward ratio and average corruption in U.S. states for 1987-2000

2.7 Concluding remarks

The aim of this paper is a novel attempt to analyse the effects of journalism on the distribution of candidates across levels of government. Specifically, how bad and good candidates self-select to local and national level anticipating journalist decision to investigate at local or national level. I develop a simple game-theoretical model in which four candidates choose to run either locally or nationally, and the journalist chooses to investigate at a local or national level.

Moreover, candidates' decisions are driven by the relative difference between rewards across levels, and in the case of bad candidates, by the ratio of a scandal cost and the national payoff. Therefore, the pool of candidates across levels is endogenously determined, and the journalist's decision affects both the pool of candidates and the distribution of good and bad candidates across levels of government.

The model yields several insights. First, increasing the scandal cost for being exposed in a journalist report does not deter bad candidates from running nationally (when the reward

ratio is large enough); it only makes that both, bad and good candidates are distributed evenly across levels of government. Second, when the reward ratio is on a specific range, increasing the scandal cost for being exposed in a journalist report creates only two opposite equilibria. In the first equilibrium, a single bad candidate runs locally, whereas in the other equilibrium only a single good candidate runs locally. Another interesting result is that there is a non-monotonic relationship between the probability of a bad candidate being elected at a local level and the reward ratio. A priori, a higher payoff at local level will make the office more attractive for bad candidates. However, the effect is ambiguous since good candidates are also attracted to local office. This creates incentives for bad candidates to run nationally as well.

The model presented here abstracts from the option that candidates may not choose to run for an office. This feature can be incorporated, however, it would require considering running costs; which makes the model more complicated by creating a multiplicity of equilibria. Also, this option would create trivial equilibria, such as one in which nobody runs for an office. Although the model is simple as possible, the multiplicity of equilibria arise (in particular of mixed strategy) due to the number of players and the levels of government.

2.8 Appendix

Proof of Proposition 4.

Proof. In this equilibrium, the payoff of a good candidate is $\frac{M_N}{4}$. A bad candidate has a payoff of $\frac{M_N - \alpha C}{4}$, and the journalist has a payoff of $\frac{1}{2}P\alpha$. If a bad candidate deviates, his payoff is $M_L - C\alpha$. Deviating is not profitable for a bad candidate if $\frac{M_N - \alpha C}{4} \geq M_L - C\alpha$, that is, if $\frac{1}{4} - \frac{1}{4}c\alpha \geq m - c\alpha$. Thus, if $m \leq \frac{1}{4} + \frac{3}{4}c\alpha$ deviating is not profitable for a bad candidate. Moreover, if a good candidate deviates, his payoff is M_L , hence, deviating is not profitable if $\frac{1}{4}M_N \geq M_L$, that is $m \leq \frac{1}{4}$. The journalist's payoff from deviating is $\frac{1}{2}P\alpha$. Hence, the journalist has the same payoff if she investigates nationally or locally. As stated before, in this case the journalist will prefer to investigate nationally. Now suppose $m > \frac{1}{4}$. In this case a good candidate has a profitable deviation by running locally, that is $\frac{1}{4}M_N < M_L$. Thus, the equilibrium of the form $(GGBB, \emptyset)$ does not exist if $m > \frac{1}{4}$.

Figure 2.8.1 illustrates the set of parameters such that there is an equilibrium of type $(GGBB, \emptyset)$.

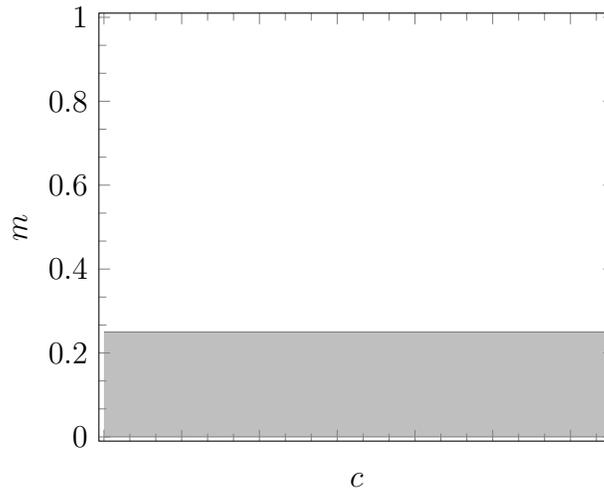


Figure 2.8.1: The equilibrium of type $(GGBB, \emptyset)$

□

Proof of Proposition 5.

Proof. Given the strategy profile (G, GBB) , a good candidate running locally has a payoff of $\frac{1}{3}M_L$. Deviating gives him a payoff of $\frac{1}{2}M_N$. Deviating is profitable if $\frac{1}{3}M_L < \frac{1}{2}M_N$, that is $m < \frac{3}{2}$ which is always true. Thus, a good candidate has a profitable deviation. Now given the strategy profile (B, GGB) , a good candidate has a payoff of $\frac{M_L}{3}$. A deviation payoff for a good candidate is $\frac{M_N}{2}$. The deviation is profitable if $\frac{M_L}{3} < \frac{M_N}{2}$, that is, if $m < \frac{3}{2}$. Since $m < 1$, a good candidate has always a profitable deviation. Finally, given the strategy profile $(\emptyset, GGBB)$, a good candidate has a payoff of $\frac{M_L}{4}$. A deviation payoff is M_N , which is always larger than $\frac{M_L}{4}$, since $M_N > M_L$. \square

Proof of Proposition 6.

Proof. First let us prove the equilibrium of type (GGB, B) . In this equilibrium, any candidate running nationally has a payoff of $\frac{1}{3}M_N$. A bad candidate running locally has a payoff of $M_L - C\alpha$, and the journalist a payoff of $P\alpha$. If a good candidate deviates, he gets a payoff of $\frac{1}{2}M_L$. Deviating is not profitable if $\frac{1}{3}M_N \geq \frac{1}{2}M_L$, that is, $m \leq \frac{2}{3}$. If the bad candidate running nationally deviates, he gets a payoff of $\frac{M_L - C\alpha}{2}$. Deviating is not profitable if $\frac{1}{3}M_N \geq \frac{M_L - C\alpha}{2}$, that is $m \leq \frac{2}{3} + c\alpha$. The bad candidate running locally gets a payoff from deviating of $\frac{1}{4}(M_N - C\alpha)$ because the journalist will deviate and investigate nationally. Deviation is not profitable if $M_L - C\alpha \geq \frac{1}{4}(M_N - C\alpha)$, that is, $m \geq \frac{1}{4} + \frac{3}{4}c\alpha$. The journalist has a payoff of $\frac{1}{3}P\alpha$ from deviating. Deviation is not profitable since $P\alpha > \frac{1}{3}P\alpha$.

Now suppose $m > \frac{2}{3}$. In this case a good candidate would be better off by running locally, that is $\frac{1}{3}M_N < \frac{1}{2}M_L$. Thus, the equilibrium of the form (GGB, B) does not exist if $m > \frac{2}{3}$. Now suppose $m < \frac{1}{4} + \frac{3}{4}c\alpha$. In this case the bad candidate running locally is better off by running nationally, that is $M_L - C\alpha < \frac{1}{4}(M_N - C\alpha)$. Thus the equilibrium of the form (GGB, B) does not exist if $m < \frac{1}{4} + \frac{3}{4}c\alpha$. Figure 2.8.1 illustrates the set of parameters such that there is an equilibrium of type (GGB, B) .

Now let us prove equilibrium of type (GGB, G) . In this equilibrium, a bad candidate has a payoff of $\frac{M_N - C\alpha}{3}$. The good candidate running nationally has a payoff of $\frac{1}{3}M_N$, and the good candidate running locally a payoff of M_L . The journalist has a payoff of $\frac{2}{3}P\alpha$ for

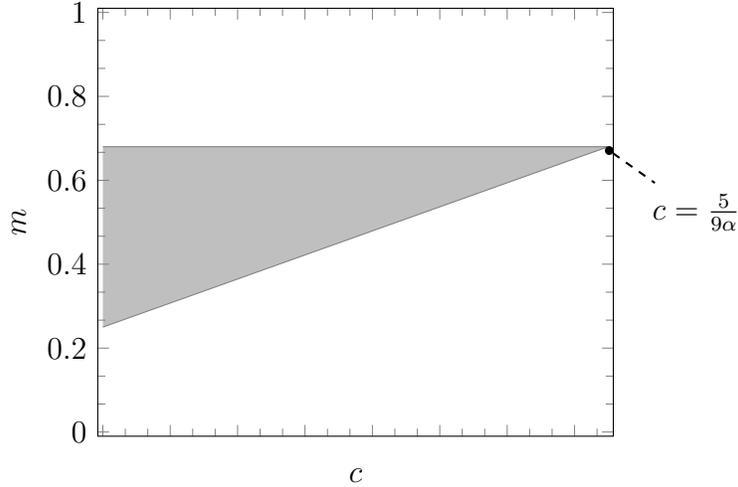


Figure 2.8.2: The equilibrium of type (GGB, B)

investigating the nationally elected candidate. If any candidate running nationally deviates, he gets a payoff of $\frac{1}{2}M_L$ because the journalist will continue to investigate nationally. So, deviation is not profitable for a bad candidate if $\frac{M_N - C\alpha}{3} \geq \frac{1}{2}M_L$, that is, $1 - c\alpha \geq \frac{3}{2}m$. Hence, deviation is not profitable for any candidate if $m \leq \frac{2}{3}(1 - c\alpha)$. A good candidate running locally has a payoff of $\frac{1}{4}M_N$ if he deviates. Deviation is not profitable if $M_L \geq \frac{1}{4}M_N$, that is, $m \geq \frac{1}{4}$. The journalist has a payoff of zero if she deviates. Thus, the journalist always investigates nationally.

Now suppose $m < \frac{1}{4}$. In this case the good candidate running locally is better off by running nationally, that is $M_L < \frac{1}{4}M_N$. Thus, the equilibrium of the form (GGB, G) does not exist if $m < \frac{1}{4}$. Now suppose $m > \frac{2}{3}(1 - c\alpha)$. In this case a bad candidate is better off by running locally, that is $\frac{M_N - C\alpha}{3} < \frac{1}{2}M_L$. Thus, the equilibrium of the form (GGB, G) does not exist if $m > \frac{2}{3}(1 - c\alpha)$. Figure 2.8.2 illustrates the set of parameters such that there is an equilibrium of type (GGB, G) .

□

Proof of Proposition 7.

Proof. First, let us prove equilibrium of type (GB, GB) . In this equilibrium, a candidate running nationally has a payoff of $\frac{1}{2}(M_N - C\alpha)$ if he is bad, and a payoff of $\frac{1}{2}M_N$ if he is

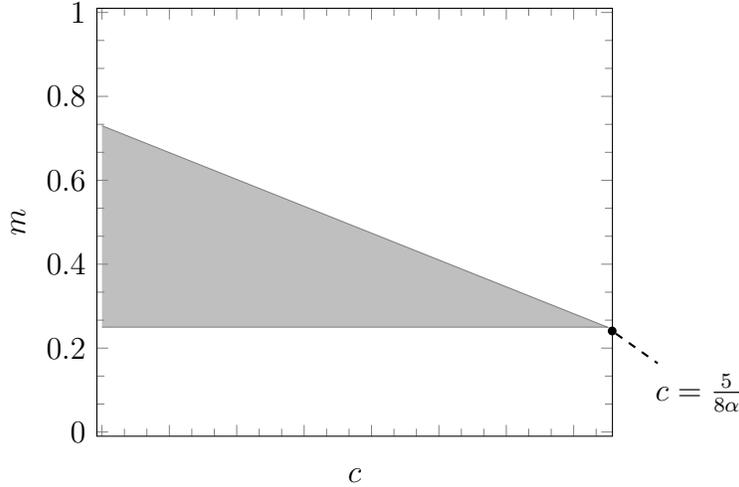


Figure 2.8.3: The equilibrium of type (G, BB, G)

good. Locally, any candidate has a payoff of $\frac{1}{2}M_L$. The journalist has a payoff of $\frac{1}{2}P\alpha$. If the bad candidate running nationally deviates he gets a payoff of $\frac{1}{3}(M_L - C\alpha)$. Deviating is not profitable for the bad candidate if $\frac{1}{2}(M_N - C\alpha) \geq \frac{1}{3}(M_L - C\alpha)$, that is, if $\frac{1}{2} - \frac{1}{6}c\alpha \geq \frac{1}{3}m$, so if $m \leq \frac{3}{2} - \frac{1}{2}c\alpha$, deviating is not profitable for the bad candidate running nationally. If a bad candidate running locally deviates, he gets a payoff of $\frac{1}{3}(M_N - C\alpha)$. Deviating is not profitable if $\frac{1}{2}M_L \geq \frac{1}{3}(M_N - C\alpha)$, that is, if $\frac{3}{2}m \geq 1 - c\alpha$, so if $m \geq \frac{2}{3}(1 - c\alpha)$ deviating is not profitable for the bad candidate running locally. If the good candidate running locally deviates, he gets a payoff of $\frac{1}{3}M_N$. Deviating is not profitable if $\frac{1}{2}M_L \geq \frac{1}{3}M_N$, that is, if $m \geq \frac{2}{3}$. If the good candidate running nationally deviates he gets a payoff of $\frac{1}{3}M_L$. Deviating is not profitable if $\frac{1}{2}M_N \geq \frac{1}{3}M_L$, that is, if $m < \frac{3}{2}$. The journalist has payoff of $\frac{1}{2}P\alpha$ if she deviates. Hence, there is no profitable deviation for the journalist since she will investigate nationally.

Now suppose $m < \frac{2}{3}$. In this case the good candidate running nationally is better off by running locally, that is $\frac{1}{2}M_L < \frac{1}{3}M_N$. Thus, the equilibrium of type (GB, GB) does not exist if $m < \frac{2}{3}$. The figure 2.8.3 illustrates the set of parameters such that there is an equilibrium of type (GB, GB) .

Now let us prove equilibrium of type (GG, BB) . In this equilibrium, a good candidate

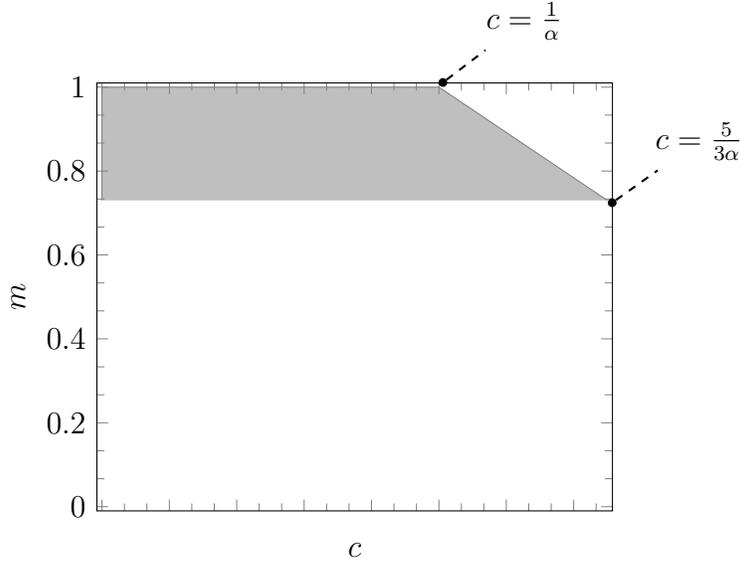


Figure 2.8.4: The equilibrium of type (GB, GB)

has a payoff of $\frac{1}{2}M_N$, whereas a bad candidate has a payoff of $\frac{1}{2}(M_L - C\alpha)$. Given the candidates' strategy profile, the journalist investigates locally, since her payoff is $P\alpha > 0$. A good candidate has a deviation payoff of $\frac{M_L}{3}$. Deviating is not profitable if $\frac{1}{2}M_N \geq \frac{1}{3}M_L$, that is $m < \frac{3}{2}$ which is always true. A bad candidate has a deviation payoff of $\frac{1}{3}M_N$ because the journalist will investigate locally, this is not profitable if $\frac{M_L - \alpha C}{2} \geq \frac{M_N}{3}$, that is if $m \geq \frac{2}{3} + \alpha c$. Hence, no deviation is profitable if $m \geq \frac{2}{3} + \alpha c$. Now suppose $m < \frac{2}{3} + \alpha c$. In this case, a bad candidate is better off by running nationally, that is $\frac{M_L - \alpha C}{2} < \frac{M_N}{3}$. Thus, the equilibrium of the form (GG, BB) does not exist if $m < \frac{2}{3} + \alpha c$. The figure 2.8.4 represents the equilibrium of type (GG, BB) .

Finally, let us prove equilibrium of type (BB, GG) . In this equilibrium, a good candidate has a payoff of $\frac{1}{2}M_L$, whereas a bad candidate has a payoff of $\frac{1}{2}(M_N - C\alpha)$. Given the strategy profile, the journalist investigates nationally, since $P\alpha > 0$. If a good candidate deviates his payoff is $\frac{M_N}{3}$. The deviation is not profitable if $\frac{M_L}{2} \geq \frac{M_N}{3}$, that is $m \geq \frac{2}{3}$. A bad candidate has deviation payoff of $\frac{M_L}{3}$ because the journalist will continue to investigate nationally. Deviating is not profitable if $\frac{M_N - \alpha C}{2} \geq \frac{M_L}{3}$, that is $m < \frac{3}{2}(1 - \alpha c)$. Now suppose $m < \frac{2}{3}$. In this case a good candidate is better off by running nationally, that is $\frac{M_L}{2} \geq \frac{M_N}{3}$.

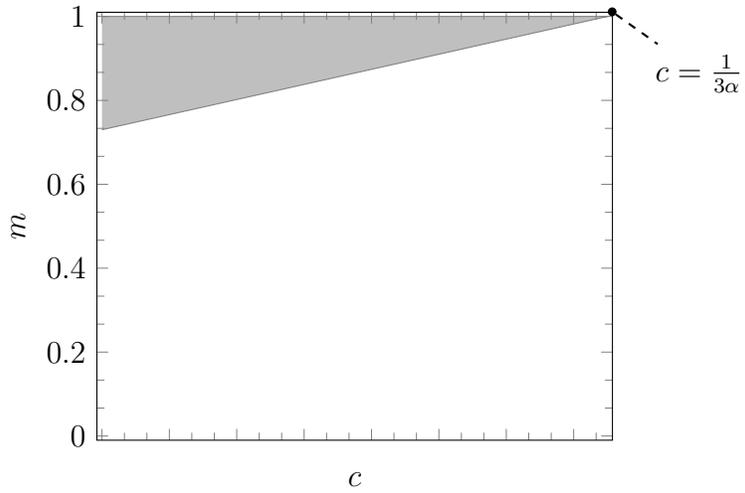


Figure 2.8.5: The equilibrium of type (GG, BB)

Thus, the equilibrium of type (BB, GG) does not exist if $m < \frac{2}{3}$. Figure 2.8.5 represents the equilibrium of type (BB, GG) .

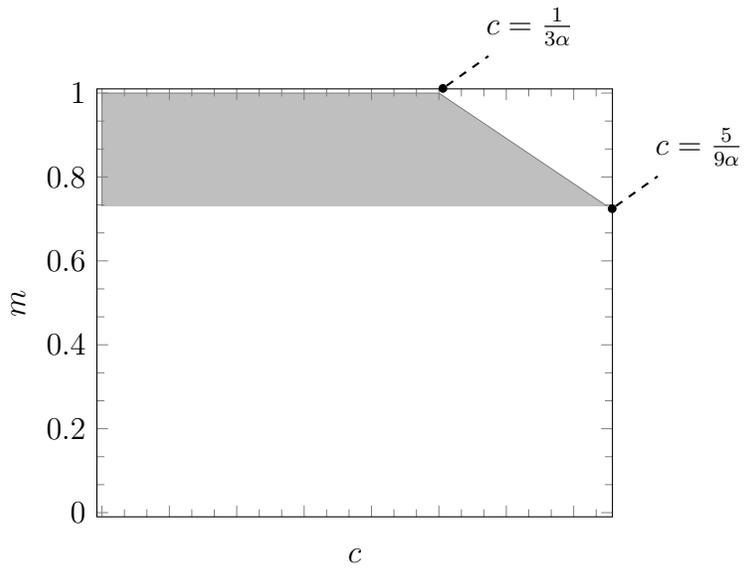


Figure 2.8.6: The equilibrium of type (BB, GG)

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Chapter 3

The Mexican political system and its consequences on political corruption

José Antonio Carrillo-Viramontes

Abstract

The aim of this paper is to provide a brief description and an overview of the political system in Mexico. In particular, I describe the the economic and political consequences that a one-party hegemony has had on the political corruption and accountability in Mexico. Moreover, I identify in the literature the determinants of the relationship between political systems and political corruption. As the evidence suggests, the characteristics of the Mexican political system along with the hegemony, high centralized public finances, and a lack of electoral punishment have increased Mexico's political corruption, and ultimately reduced political accountability. Moreover, there is a clear association between presidential systems and political corruption.

Keywords: Political system, corruption, political accountability, political party.

JEL Classification Numbers: D73, D72.

3.1 Introduction

Corruption has been an important issue for Latin American countries. However, in Mexico, corruption is one of the most important concerns of the Mexican society. For example, according to [OECD \(2017a\)](#) Mexicans consider insecurity and crime, and corruption as the most important concerns, on top of issues such as unemployment or poverty.

According to [Morris \(1999\)](#), one of the main causes of political corruption in Mexico is its own political system. Moreover, he points out that the corruption problem in Mexico is historical, and is considered a crucial characteristic of the political system.

The aim of this paper is threefold. First, I provide a brief description and overview of the political system in Mexico. Second, I describe the consequences of the one-party hegemony on political corruption and accountability in Mexico. Third, I analyse the determinants of political corruption in the literature.

The relationship between political systems and political corruption is not new. As pointed out by [Persson *et al.* \(1997\)](#), elections are the main mechanism for disciplining politicians in democracies; however, it is not sufficient. Precisely, they analyse why electoral sanctions are not enough to discipline the executive or legislatures. In particular, they argue that the balance of powers among the executive, the legislature and the citizens is unbalanced.

The main result of their theoretical study is that separation of powers between the executive and legislature prevents abuse of power if and only if there are appropriate checks and balances. A relevant application of their result is the budget process. The executive can choose the size of the budget, but the legislature can decide its composition. This separation of powers can prevent abuse of power.

In [Gerring and Thacker \(2004\)](#), the source of perceived political corruption lies in the composition of the executive as well as the territorial sovereignty. To measure political corruption, they use the international polls by Kaufmann, Kraay and Zoido-Lobaton (KKZ index). Their main finding is that unitary and parliamentary governments help reduce the level of perceived corruption. Also, their results indicate that centralized constitutions

promote lower levels of political corruption.

Similarly, [Kunicova and Rose-Ackerman \(2005\)](#) study how electoral rules and constitutional structures affect political corruption. Specifically, they compare the effects of plurality systems and proportional representation on political corruption. Their main findings are that proportional representation and presidential systems are associated with more political corruption such as rent seeking. However, the Mexican political system does not allow for re-election and, therefore, the electoral punishment may be weak. For example, [Cleary \(2007\)](#) argues that electoral sanctioning in Mexico is not associated with better government performance, but political participation such as protest can enhance political accountability.

The rest of the paper is structured as follows. The next section gives a brief overview of the Mexican political system. Then, [Section 3.3](#) describes the consequences of one party hegemony in political corruption, political accountability and the costs of it. [Section 3.4](#), discusses the determinants of political corruption. A conclusion is presented in [section 3.5](#).

3.2 The Mexican Political System

Mexico is a federal country with three levels of government: the federal union, the state governments, and municipal governments. Moreover, there are three branches that compose the Mexican presidential system: The executive, which is represented by the head of the state, the president of the United Mexican States; the legislative, which is represented by the senators and deputies; and the judiciary, which is represented by the Supreme Court of Justice. Regarding the number of administrative jurisdictions in the country, Mexico has 31 states and a special federal entity (Mexico city), also has 2,477 municipalities.

The current presidential system is based on the 1917 constitution. The constitution was drafted during the 1910 Mexican revolution and approved seven years later. The revolution outbreak intended to solve the presidential succession of a 35 years regime. The Mexican civil revolution would change the political system. Following the principles of the Mexican

revolution, the National Revolutionary Party was founded in 1929. Sixteen years later the National Revolutionary Party would change his name to the Institutional Revolutionary Party (hereafter PRI, by its acronym in Spanish) and emerge as a centre-left party.

In 1939 the opposition party was founded, a centre-right party, the National Action Party (PAN). These two parties stand alone in the political arena until 1989, when a left ideology party the Democratic Revolution Party (PRD) was founded. Historically, these three political parties would be the main political parties in Mexico. Currently, there are 9 national political parties, this parties can participate in all elections, that is national, state and local.¹ Locally there are more than 15 political parties, these however, can only participate in state and local elections. ²

3.3 One-party hegemony and its consequences

A particular feature of Mexico is its political scene. Mexico is the only democratic country in the world in which a political party has been in power for more than 70 years, creating a virtual monopoly of the political power. The PRI won his first national election in 1929 and then won every presidential election in straight until 2000 when a different political party won the national election. This historic defeat suggested an important transition in the Mexican political system towards a more competitive and democratic system ([Hiskey and Bowler, 2005](#)).

The one-party hegemony had important political, economic and social consequences for the country. The Institutional Revolutionary Party (Partido Revolucionario Institucional in Spanish, or PRI) ruled from 1929 to 2000 by winning all the presidential elections during the period. Moreover, during this period the PRI had around 99.8% of the executive's legislative proposals approved ([World Bank, 2007](#)).

¹One of the newest party is MORENA, which is now one of the main political party within only 3 years of being founded.

²For a brief description of the current political landscape in Mexico see <https://mexicoinstituteonelections2015.wordpress.com/2015/06/08/a-fragmented-political-landscape/>

However, the party's power was not constrained to national level only. For example, it is not until the late 80's that important municipalities and most northern states opposition candidates were able to win state and municipal offices (Blum Valenzuela, 1996). Figure 3.3.1, shows how the political hegemony has been decreasing gradually from 1985 to 2006 in both state and local levels.

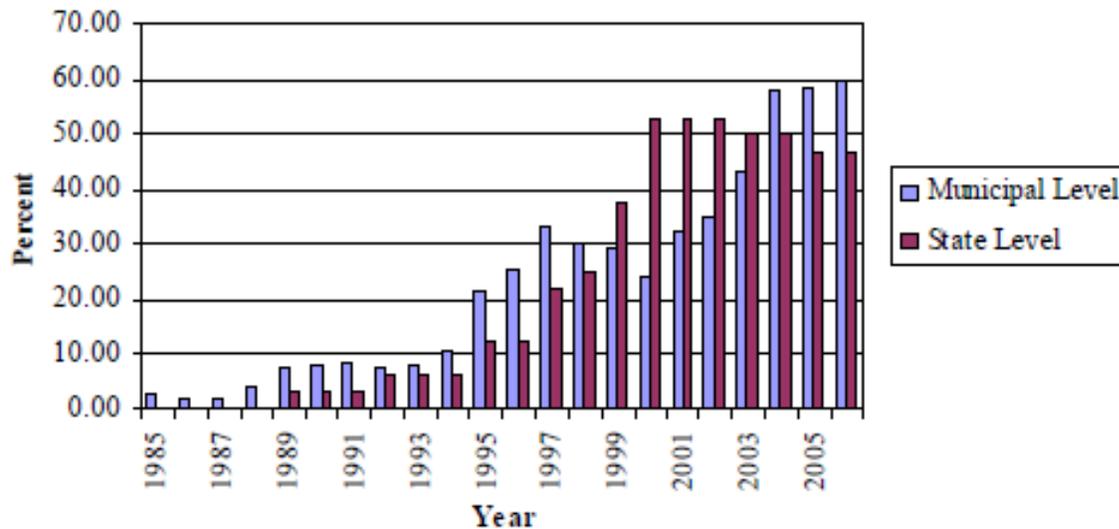


Figure 3.3.1: Percent of Municipalities and States governed by Parties other than PRI, 1985-2006. Source: World Bank (2007).

The political hegemony and the strong centralization of public finances contributed to creating a corrupt environment in the Mexican political arena. For example, Morris (2009) argues that Mexico's political system is crucial to explain not only the causes but consequences and persistence of corruption in Mexico. Moreover, he argues that along with one-party hegemony, weak institutions such as the legislative and judicial systems, the ban of re-election, and a general lack of accountability were crucial for a persistent corruption.

The one-party hegemony affected not only democracy but also the economic landscape of Mexico. According to Robinson (2009) extreme economic inequality and weak institutions are natural outcomes of one-party hegemony. Moreover, diversity is one of the main characteristics of Mexico. The country is geographical, culturally, socially and economically heterogeneous. Regarding the economic heterogeneity, the following statistics give us

a broad picture of Mexico's economic inequality. Only three states including Mexico city produce around 40% of the country's GDP, whereas southern and poorer states like Oaxaca, Chiapas, Guerrero and Hidalgo produce only 7% of the country's GDP ([Hernandez-Trillo and Jarillo-Rabling, 2008](#)). Moreover, Mexico ranks among top OECD countries with the highest income inequality. The richest 10% of the population in Mexico earns 20 times more than the poorest 10% ([OECD, 2017b](#)).

3.3.1 Political corruption

Another consequence of political dominance is corruption. As [Morris \(1999\)](#) points out, Mexican contemporary history is full of scandals, scapegoating and even manipulated anti-corruption policies. As he puts, "...corruption is not a characteristic of the system in Mexico... it is the system". For example, [Morris \(2005\)](#) analyses the effect of economic, demographic and political features of the Mexican states on corruption. Specifically, he uses an index of corruption and good government as a proxy for state-level bureaucratic corruption. The index is created by measuring the number of times in which an individual paid a bribe in order to obtain a government service during a period. One interesting feature of the study is the use of shares of votes to measure election competitiveness. The main hypothesis to test is that the higher share of votes for the political party PRI, the higher the level of corruption. He finds a positive and significant relationship between the level of corruption and PRI's share vote.³

3.3.2 Political accountability

The lack of political accountability is another factor that promotes political corruption. Disciplining politicians either electorally or judicially is a crucial task for reducing political corruption. One way to promote political accountability is by the use of mass media. Media

³Although there was no significant difference based on the political party in power, still, the coefficient was higher when PRI is in power. (see [Morris \(2005\)](#).)

outlets can reveal information about politicians, for example, misuse of public resources, nepotism, embezzlement, etc. The information revealed can be used by the voters to punish politicians in the election.

For example, [Larreguy *et al.* \(2014\)](#) investigate the effect of Mexican media outlets on electoral accountability. Specifically, they analyse the electoral effects of the release of municipal audit reports on the use of the Municipal Fund for Social Infrastructure (FISM). The Fund represents around 24 percent of total municipality's resources, and the audits are made by an independent institution, Mexico's Federal Auditor's Office (ASF) on time random basis. Since re-election is not possible in Mexico due to term limits, voters may punish the political party of the malfeasant mayor in the next election. Their main result is that an additional local media station in the Mexican municipality reduces the vote share of the incumbent political party whose mayor was revealed to be corrupt. The effect is larger if the local media station is a television station. The reason is that a TV station is the main political information source for voters.

However, there is some evidence in Mexico as well that shows that information about political corruption may not be sufficient to improve political accountability and ultimately reduce corruption in Mexico. For example, [Chong *et al.* \(2014\)](#) study how information about corruption affects political participation and party support in Mexican local elections. Specifically, they study how corruption information about politicians affect the support of the incumbent party and also challenger parties, at the end of their office period. Conducting a field experiment, they randomly allocate polling stations to a campaign spreading information about the use of public expenditure and corruption in municipal elections in Mexico.

The main findings are two. First, spreading information about corruption can decrease voter turnout by 2.5%. Moreover, this effect is larger when the challenger party's candidates were congressmen. Second, spreading information about corruption also decreases 2.5% of vote share to the incumbent party and challenger parties. Thus, information about

corruption discourages voters from participating in elections. In other words, spreading information about corruption can have a counter effect on political accountability since fewer voters engage in the political process.

Moreover, when voters perceived high corruption, the level of mistrust in democracy rises, especially regarding electoral outcomes. For example, [McCann and Dominguez \(1998\)](#) provide empirical evidence of the large mistrust of Mexicans about the integrity of elections and policy-making process. Particularly, they use data from national surveys conducted in Mexico in the following years 1986, 1988, 1991, and 1994 to understand the impact of mistrust on electoral outcomes, support of the opposition candidates', turnout, and voters' choices on the election day.

Their hypotheses are two. First, they expect that fraud and corruption would increase support for the opposition party. Second, they also expect a negative correlation between corruption and fraud and voter turnout. The main results of this study are the following. First, electorally the incumbent party was barely punished. The reason is that the opposition has little benefit from the perception of fraud and corruption against the incumbent party. Second, the opposition was more affected by the voters' mistrust because the voter turnout was very low, therefore, electoral abstention hurts more the opposition than the incumbent party itself.

Another study that analyses electoral competition and political accountability in Mexico is [Cleary \(2007\)](#). In particular, he studies if municipal government performance in Mexico is affected by electoral punishment rather than non-electoral participation. To do so, he uses a dataset containing information about socio-economic, electoral and public finance from Mexican municipalities from 1989 to 2000.

The main hypotheses he test are the following: i) better government performance is positively correlated with higher electoral competition, ii) better government performance is positively correlated with higher voter turnout, and iii) better government performance is positively correlated with higher political participation in conjunction with the electoral

competition. The main result is that the performance of municipal governments in Mexican municipalities does not respond to electoral punishment, but to non-electoral participation such that protest, public meetings, and individual contact with government officials.

3.3.3 Costs

Corruption has many negative consequences, but the economic consequences of political corruption have been an important downside in Mexico's economic development. It is, therefore, no surprise that corruption is one of the most important concerns for Mexican society. In 2002 *latinobarometro* (as cited in [Morris \(2005\)](#)) report that 77 percent of Mexicans consider civic servants as corrupt. Moreover, according to a news article, corruption could be costing to Mexico around 890 billion pesos a year (53 billion dollars), or 5% of the country's GDP.⁴

Transparencia Mexicana, a Mexican non-governmental organization reported in 1999 that two hundred and fourteen millions of acts of corruption happened in Mexico in a 12 month period. The same organization reported that 23 billion pesos are paid in bribes in Mexico during that year. The effects of corruption are widespread. As a consequence, Mexico's economic performance has been severely affected.

3.4 Corruption and its determinants

Corruption has been recognized as a factor that prevents economic development. In particular, political corruption can create an inefficient allocation of public resources, reduce government quality and performance, and also reduce private investment. Considering the above, a natural question would be: what are the necessary conditions for political corruption to arise and persist? [Aidt \(2003\)](#) recognizes three main conditions.

The first one is discretionary power. A public official with discretion to design, allocate and use public resources is more likely to use this power for corruption. The second condition

⁴<https://qz.com/545958/mexico-would-be-an-economic-superstar-without-corruption/>

is economic rents. The discretionary power is strongly related to the extraction of economic private rents, therefore, a public official can extract or create private rents. The third condition is weak institutions. Weak institutions or lack of political accountability can create incentives for corrupt public officials to extract rents.

Regarding the third condition, [Lederman *et al.* \(2005\)](#) study the determinants of political corruption with a particular emphasis on the role of political institutions. In particular, they use the International Country Risk Guide (ICRG) to measure political corruption. The ICRG index captures the likelihood that government officials would accept or demand bribes. To capture the effect of political features on corruption they use several variables such that democracy, re-election, press freedom among others. The dataset covers a period from 1984 to 1999 for more than 140 countries.

The main result of their study is that countries under democratic or parliamentary systems, political stability, and high freedom of the press are correlated with lower political corruption. Moreover, they found that cultural and historical factors also affect democracy and corruption.

The effect of press freedom on political corruption has been recognized by the literature. For example, [Camaj \(2013\)](#) analyses how press freedom, electoral competition, voter turnout, judicial independence, and the type of political system can affect political corruption. In particular, she tests the following hypotheses: i) higher levels of press freedom will decrease corruption, ii) the negative correlation of press freedom and political corruption is magnified in countries with the lower electoral turnout, iii) the negative correlation between press freedom and political corruption is magnified in countries with lower electoral competition. To do so, she uses a dataset composed of 133 countries and uses the Transparency International Corruption Perceptions Index (TI CPI) to measure political corruption. The period of the study is 2004 to 2008.

The main finding of her analysis is that a marginal increase in press freedom decreases a corruption level by 7% approximately. Also, she found a negative and significant relationship

between voter turnout and political corruption. Moreover, presidential systems are highly correlated with higher corruption rather than parliamentary systems.

Similar to these findings, [Samuels \(2004\)](#) studies the role of political institutions on governmental accountability. Specifically, he studies the effect of presidential systems as opposed to a parliamentary system on electoral punishment, and voter participation. He uses aggregate and electoral data of 23 presidential democracies, having samples of 75 presidential elections and 103 legislative.

The main results are two. First, accountability, defined as the capacity to sanction or reward incumbent politicians by the electorate, is weak in non-concurrent elections. Second, voters punish presidents more than legislators for the same issue. Therefore, presidential systems are correlated with higher levels of accountability when there is higher turnout, whereas parliamentary systems do not need this level of electoral participation.

3.5 Conclusion

The aim of this paper twofold. First, I provide a brief description and an overview of the political system in Mexico. Second, I describe the consequences of the one-party hegemony on political corruption and accountability in Mexico. This paper also identifies the determinants of political corruption in literature. As the evidence suggests, the Mexican political system along with a one-party hegemony, high centralized public finances, and a lack of electoral punishment have been affecting Mexico's political corruption. Moreover, there is a correlation between the presidential systems and political corruption identified in the literature.

There are still open questions about the effect of a political system on political corruption and political accountability. The description of the Mexican political system and the one party-hegemony creates a unique set of features that open research avenues. For example, has the decrease of the one-party political hegemony decreased political corruption at the national level and/or local level in Mexico? How does the separation of powers in

Mexico promote an unequal distribution of corruption? Also, the Mexican characteristics of the political system might affect political selection. For example, has the national hegemony created by the PRI created an unequal distribution of bad or good politicians across governmental levels? I leave these and other interesting questions open for a future research.

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Conclusion

The aim of this thesis is to analyse theoretically how media can enhance voters' imperfect information and, therefore political accountability and selection. The thesis contributes theoretically to the political agency literature by providing a novel analysis on the effects of media spillovers on disciplining politicians and on the effects of journalism into the distribution of bad (good) candidates across levels of governments.

In particular, Chapter 1 analyses theoretically how voters use information from media spillovers to discipline politicians when the spillovers depend on the geographic localization of a jurisdiction. The yardstick competition model demonstrates that within isolated jurisdictions (without media spillovers) politicians are more likely to extract private rents. Whereas in a jurisdiction connected with two neighbouring jurisdictions, politicians have a lower probability of engaging in rent extraction. I also show that even incumbents in isolated jurisdictions have a lower probability of engaging in obtaining private rents due to positive spillovers from neighbouring jurisdictions via voters' incumbency advantage. In other words, yardstick competition creates positive spillovers (although small) even for those jurisdictions which are isolated (i.e., not exposed to yardstick competition).

Chapter 2 theoretically analyses the effects of a journalist on the distribution of bad and good candidates across levels of government. Specifically, how bad (good) candidates self-select to local or national office anticipating the journalist's decision to investigate at local or national level. In the model, candidates' decisions are driven by the relative difference in the rewards for being the representative at a local or national office; and in the case of bad

candidates also by the potential scandal cost of being exposed by the journalist.

The theoretical model demonstrates that increasing the scandal cost of being exposed in a journalist report, does not deter bad candidates from running nationally (when the reward ratio is large enough). Indeed, it only makes that both, bad and good candidates to be distributed evenly across levels of government. Also, I found that when the reward ratio is on a specific range, increasing the scandal cost of being exposed in a journalist report creates only two opposite types of equilibria: one in which a bad candidate runs locally, whereas, in the other one, a good candidate runs locally. Moreover, I found a non-monotonic relationship between the probability of a bad candidate being elected at a local level and the reward ratio.

Chapter 3 provides a brief description and an overview of the political system in Mexico. In particular, it describes the economic and political consequences that a one-party hegemony has had on the political corruption and accountability in Mexico. As the evidence suggests, the characteristics of the Mexican political system along with the hegemony, high centralized public finances, and a lack of electoral punishment have increased Mexico's political corruption, and ultimately reduced political accountability.

Results from Chapter 1 and Chapter 2 suggests that media, that is both, mass media and journalism, can enhance political accountability and political selection. However, in the case of journalism, Chapter 2 identifies a trade-off between the distribution of bad candidates across levels of government. A future research in this area seems promising, especially on how journalism reports can affect the probability that a bad/good candidate to win an election.