Essays on Political Accountability in Non-Democratic Regimes

by

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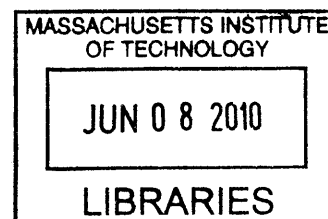in partial fulfillment of the requirements for the degree of

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Abstract

This thesis is a collection of three independent essays on the causes and consequences of local elections in non-democratic regimes.

The first essay examines the political consequences of local elections on the first democratic election after the fall of an autocratic regime. My theoretical analysis highlights that officials that were appointed by upper levels of government have a stronger incentive to continue to use local patronage networks to signal their alignment to upper levels of government, in order to protect their jobs. Therefore, if the previous dictator's party has a substantial probability of winning the election, appointed leaders will promote their electoral chances, which could become an impediment for the process of democratic consolidation. In contrast, elected local officials have a weaker incentive to signal their political leanings since their continuity in their positions does not depend on changes in upper levels of government. I provide evidence from the first democratic election in Indonesia after the fall of Suharto that corroborates the implications of the model.

The second essay evaluates the economic and social impact of the introduction of local elections rural China during the last three decades. Our empirical findings highlight that elections led to a substantial reduction in income and income growth, decreased within village inequality and relaxed the enforcement of unpopular policies. These effects seem to be driven by a redistribution of assets from firms to households. We provide a simple model to illustrate how these findings can theoretically be a consequence of the shift in the accountability of local leaders, from the central government towards villagers.

The third essay investigates the determinants of the existence of local elections in non-democratic regimes. I develop a theoretical framework to explore the trade-offs for a dictator in the decision to allow local elections. The model highlights that, if the dictator values the competence of local politicians and voters have intermediate costs of military intervention, the dictator prefers local elections over an appointment system. In this scenario, elections aggregate voters' private information on competence efficiently and the ex-post alignment of voters' and dictator's preferences is maximized.

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This thesis, and any other of my achievements in life, would not have been possible without the support and the love of my family. I thank my brother Andrés for inculcating in me a passion for math and for fostering my curiosity of "how things work" at early stages of my life. I thank my sister Lurdes for making sure my childhood was full of exciting experiences and for her protection in multiple occasions (including rescuing me from airline disruptions that jeopardized my chance to arrive in the US). I thank my sister Cristina for inspiring me to have high aspirations in life and to follow my dreams. I thank my nephews Eric and Nil for being a continuous source of encouragement to contribute to understand a bit better how the world works, so that they could hope for a brighter future. I thank my father Quirino, for his unconditional love and his efforts to protect me and my career from any possible adversity I encountered in life. I thank my mother Antonia for being a continuous source of inspiration and encouragement. Her indignation about the injustices of life and her exceptional hard working spirit have deeply influenced my way of understanding the world, my choice of career and my will to dedicate all my energy to make her proud of me.

Finally, this thesis is dedicated to the memory of my grandparents, Eleuteria, Saturnino, Hermenegildo, and Juliana, whom I never had the opportunity to meet, but whom I wish to honor by continuing to make the most out of each opportunity that life grants me. Opportunities they could not even conceive their descendents one day would have.

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[1]This chapter is the result of joint work with Professor Nancy Qian, Professor Gerard Padró-i-Miquel and Professor Yang Yao.

Introduction

This thesis is a collection of three independent essays on political economy. In particular, the different chapters of this dissertation explore the causes of the existence of local elections in non-democratic regimes and their economic and political consequences.

The first essay examines the political consequences of local elections on the first democratic election after the fall of an autocratic regime. This project is motivated by the observation that the workings of new democracies are heavily influenced by the legacies of the previous autocratic regimes. In this chapter I examine the effect of one of these legacies on the process of democratic consolidation: the body of appointed officials at the lowest level of the administration. My theoretical analysis highlights that appointed officials have a vested interest in the persistence of the autocratic status quo in order to protect their jobs. At the onset of the first democratic election, they use local patronage networks to promote the electoral chances of the dictator's party. However, if there is imperfect information about the political leanings of local officials and if the reformist party is expected to win by a large majority, this effect can be reversed: opportunistic local officials will, in that case, pretend to be strong supporters of the reformist party, in an attempt to keep their jobs.

I test the empirical predictions of the model with a unique data set containing information on the electoral results for the first and second post-Suharto elections for over 30,000 villages in Indonesia. Within districts, Suharto's party was 5 percentage points more likely to win in villages with an appointed village head than in those with an elected village head. The results are robust to the inclusion of a wide set of controls and similar across econometric methods (OLS, propensity score matching). Consistent with the model, this effect is only reversed for districts in which the reformist party won by a large margin. Overall, this study provides substantial evidence that, unless reformist parties are expected to be the clear winners of the first democratic elections, appointed officials will promote the electoral chances of the dictator's party, which could become an impediment for the process of democratic consolidation.

The second essay of this dissertation uses a unique survey to study the impact of electoral reforms on income growth in rural China during the past two decades. Electoral reforms shifted the accountability of village leaders from higher levels of government towards villagers.

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We provide a simple model to illustrate how such a shift in accountability can affect leaders' incentives. The empirical findings show that this shift in accountability had mixed effects. On the one hand, it significantly reduced income growth for all households. On the other hand, it reduced income inequality and relaxed the enforcement of unpopular policies. Additional results suggest that village leaders, who were not empowered to impose taxes, reduced income inequality through redistributing assets from village enterprises to households.

The third essay investigates the determinants of the existence of local elections in non-democratic regimes. With this objective, I develop a theoretical framework to explore the trade-offs for a dictator in the decision to allow local elections. The model highlights that, if the dictator has a high valuation of competence and voters have intermediate costs of military intervention, the dictator prefers local elections over an appointment system. This result is obtained by the combination of two factors: first, elections provide a mechanism to aggregate voters' private information on local candidates' competence level. And second, elections better screening mechanism minimizes the possibility of ex-post military intervention, which makes competent candidates more likely to get into politics than they would be in an appointment regime. Voters' cost of military intervention need to be intermediate so that voters are willing to elect competent opposition leaders. If costs are low, voters elect opposition candidates very often, which makes the election system less appealing for the dictator. If costs are high, voters take the conservative approach of always electing the dictator's crony regardless of his competence level, in which case elections fail to aggregate private information efficiently. Hence, when voters' cost of military intervention is intermediate, the ex-post alignment of voters' and dictator's preferences is maximized.

Chapter 1

Appointed Officials and Consolidation of New Democracies: Evidence from Indonesia

1.1 Introduction

The first years of a democratic regime are when democracy is most vulnerable. Many scholars have recognized that several practices or institutions developed during the previous autocratic regime leave a legacy that will condition the workings of the new democracy, both in terms of their economic and political outcomes.[1] A crucial juncture when these legacies might play a critical role is at the time of the first democratic election. If the presence of these legacies prevents reformist parties from taking office, democratic deepening reforms might not be implemented, what could lead to a captured or unconsolidated democracy.

This paper examines, theoretically and empirically, how one of these legacies can affect the outcome of the first democratic election: the body of local officials. There is extensive evidence that documents the importance of local leaders for many nondemocratic regimes.[2] By means of

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[1] See, for instance, Acemoglu, Ticchi and Vindigni (2008, 2009), for how the legacy of an inefficient bureaucratic structure or a large military might affect politics in transitional democracies.

[2] Some examples are Baum and Shvchenko (1999) discussing the case of China, Magaloni (2006) on Mexico, Pepinsky (2007) on Malaysia, and Blaydes (2008) on Egypt.

local patronage networks and other intimidation mechanisms, they are able to obtain support for the regime, or simply compliance, from the population. At the onset of the first democratic election, most of them will still be in their positions and still have the means and the ability to influence voters.

However, we lack a good understanding of what incentives local officials face to continue to use these local patronage networks in the first democratic election. First, the loyalty ties that local officials had with the previous autocratic regime can suddenly change, given the new political scenario. Second, new democracies are characterized by a great amount of uncertainty regarding real political leanings. The repressive nature of nondemocratic regimes prevents the disclosure of political views different from those of the dictator's ideology. Consequently, the high degree of asymmetric information with which new democracies are endowed enables local officials to behave opportunistically during the early stages of the democratic period.

This unique political environment raises a number of questions: What incentives does local officials face to continue to influence voters in the first democratic election? Will they use the patronage network to obtain support for the previous dictator's party? Will they ever give their support to reformist parties? This paper examines these questions and also explores how the answers depend on the method of selection of local officials, in particular, on whether local officials are appointed by some upper level government, or elected in local elections.

In order to provide answers for these questions, I develop a model in which two parties (the dictator's party and a reformist party) contest the first democratic election for some upper-level office. At the lower level, there are local officials that control the patronage networks and decide how much effort to exert during the electoral campaign to influence voters in their region. Since the regime has just transitioned from a nondemocratic period, there is imperfect information about their political leanings. Hence, effort has a twofold motivation in this model: it can signal a particular political leaning to upper levels of government and it can also influence the outcome of the election.

The model highlights that local officials who are appointed by upper levels of government have a much stronger incentive to influence voters in their region. They do so because they will be able to keep their jobs only if the party they support wins the election *and* the winner of the election is confident enough that the local official is truly one of her supporters. In

contrast, elected local officials lack this incentive, because the continuity in their positions does not depend on the outcome of upper-level elections: they were elected into office through local elections and they will remain in office until local elections are held again.

The decision problem of appointed local officials constitutes a signaling game that has two broad types of equilibria: pooling and separating.[3] The model predicts that, if the election is expected to be lopsided, a pooling equilibrium emerges in which all appointed officials exert the same level of effort, regardless of their real political leanings. This is indeed a very intuitive result: when, ex-ante, one of the candidates is very likely to win, all the appointed officials exert effort to support that candidate and pretend to be her strongest supporters. If the election is expected to be contested, a separating equilibrium emerges: in the absence of a clear winner, each appointed official finds it optimal to support his most preferred candidate.

In separating equilibria, since appointed officials are exerting effort in opposite directions, the net effect depends on the proportion of them that are supporters of each party. However, the likely higher proportion of dictator's supporters would tilt the balance towards the dictator's party. Therefore, we would expect that in most scenarios, appointed officials operate the patronage networks to support the dictator's party. This effect is only reversed if the opposition party is expected to win by a large margin. In that case, a pooling equilibrium emerges and appointed local officials unambiguously support the reformist party.

I test the empirical predictions of the model with a unique data set from Indonesia, which contains information on the electoral results for the first and second post-Suharto elections for over 30,000 villages. Indonesia is the ideal setting to explore the features highlighted by the model. The country is divided into two types of villages: *desa* and *kelurahan*. In *desa* the village head is elected by villagers,[4] while in *kelurahan* the village head is appointed by the district mayor.[5] By comparing the electoral behaviors of *desa* and *kelurahan*, within districts

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[3] The solution concept I use is Perfect Bayesian Equilibrium and then I focus on those equilibria that satisfy the Intuitive Criterion.

[4] During the Suharto regime, elections for the village head in desa villages took place in a highly restricted set-up. Candidates were pre-screened and elections were nonpartisan.

[5] *Desa* villages tend to be more rural while *kelurahan* tend to be more urban. Therefore, controlling for the differences in the level of urbaness will be important for the econometric specification. Still, there is a good amount of overlap, since for historical reasons, some *kelurahan* were formed in quite rural areas. Also, the conversion of *desa* into *kelurahan* (as they became more urban) was stopped in 1992. Hence, I observe in some desa villages that are quite urban based on their observable characteristics, at the time of the first democratic election in 1999. I provide further details in the empirical section.

and when the main determinants of voting are controlled for, I aim to identify the differences in the electoral outcome that can be attributed to the different selection method of their village heads.

In the first democratic election of Indonesia post-Suharto, the electorate voted, simultaneously, for the national and district legislatures.[6] Since the designation rights of appointed village heads rested at the district level, they should have been particularly concerned about the electoral outcome at the district. This makes of the Indonesian case the ideal setting to explore whether the differences in the electoral behavior of *desa* and *kelurahan* is related to the expected electoral outcome of the district in the way the theory predicts.

The empirical results highlight that Suharto's party was, on average, 5 percentage points more likely to win in villages that had an appointed village head, relative to those that had an elected village head. This result is significant at the 1% level, robust to the inclusion of a broad set of controls and district fixed effects, and similar across different econometric methods (ordinary least squares and propensity score matching).

Consistent with the model, this result is reversed for districts in which the main reformist party won by a large margin. In those districts, the reformist party is 4 percentage points more likely to win in villages with an appointed village head relative to those with an elected village head. This result is noteworthy since alternative hypotheses that rely on the existence of unobserved heterogeneity between these two types of villages, do not provide a satisfactory rationale for this empirical pattern.

Finally, I examine the dynamic implications of the model with data from the second democratic election. The model predicts that in regions where a separating equilibrium emerged, village head turnover was high: since political leanings are truthfully revealed along the equilibrium path, when the winner of the first democratic election takes office, she is able to detect her non-supporters and fire them. In contrast, in places where the equilibrium is pooling, all appointed village heads exert the same level of effort and consequently the composition of village heads remains unchanged. Notice that this leads to somewhat counterintuitive predictions for the second election. Support of appointed village heads for a given party should be higher

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[6]The national and district legislature designated the head of the executive of the corresponding level of government.

in districts where that party won by a tight margin in the first election, and lower if they won by a large margin (in the former case, the equilibrium was separating and non-supporters were fired, while in the latter case, the equilibrium was pooling and non supporters are still in office). I provide some suggestive evidence that these mechanisms seem to be playing a role at the time of the second election.

This paper is related to a number of different literatures. First, it relates to the literature that examines the specific workings of new democracies in terms of their economic and political outcomes. Some examples are Wantchekon (1999), Brender and Drazen (2005, 2008, 2009), and Keefer (2007). My paper contributes to this literature by providing microeconomic evidence of the workings of the first and second democratic elections in Indonesia and by highlighting the importance of asymmetric information about political leanings in nascent democracies.

Second, it relates to the political science and economics literature on democratic capture by the elite or other interest groups by means of vote buying, voter co-optation, patronage networks, and the use of force or its threat. Some examples are Gershenson and Grossman (2001), Bertocchi and Spagat (2001), Robinson and Verdier (2002), Acemoglu, Ticchi and Vindigni (2009), and Acemoglu, Robinson and Santos-Villagran (2009). My paper contributes to this literature by focusing on the role of local officials and by providing evidence that, in the context of a regime change, unless the reformist parties are expected to be the clear winners of the first democratic election, appointed local officials will contribute to the persistence of the autocratic status quo.

Third, it links to the literature that investigates the different incentives that elected versus appointed officials face. See, for instance, Besley and Coate (2003), Maskin and Tirole (2004), and Alesina and Tabellini (2007, 2008). However, to my knowledge, this is the first paper to point out that even non-elected officials will have important electoral incentives in the elections for the politician or official that has decision rights over their appointment. Furthermore, I highlight that these incentives will be intensified when there is an additional motivation to signal certain political leanings.

The rest of the paper proceeds as follows. Section 2 presents the model and derives its empirical predictions. Section 3 provides an overview of the Indonesian political structure and of the organization of the state. Section 4 describes the data. Section 5 explains the empirical

strategy and discusses the main results. Section 6 presents the robustness checks that rule out competing explanations. In Section 7, I explore the dynamic implications of my model for the second democratic election. Finally, Section 8 presents the conclusions.

1.2 Model

In this section, I develop a model to understand what incentives local officials face at the onset of the first democratic election and how they vary depending on their method of selection. For an easier comparison to the empirical part, I use the Indonesian terminology in the model. In particular, I refer to local officials as village heads, some of which are appointed by the district mayor and others are elected in village level elections. However the model is, to a great extent, generalizable to other situations of two tiers of government in which designation rights of appointed local officials rest on the upper tier, and local officials have control over local patronage networks.

1.2.1 Setup

Consider a district where two candidates are contesting the seat of district mayor. Each candidate belongs to either party A or B, with subscript $m \in \{A, B\}$ denoting their party affiliation, which is publicly known. Without loss of generality, let party A be the dictator's party and party B be the reformist party.

This district is divided into N villages. In n of them the village head (he) is appointed by the mayor (she), while in the other $N - n$ villages the village head is elected by plurality rule elections held at the village level. The superscript $v \in \{app, elec\}$ stands for the selection method of the village head in village v, with app and $elec$ corresponding to appointment and election methods, respectively. Village heads have sympathies for one of the parties. The subscript $t \in \{a, b\}$ corresponds to a political sympathy towards party A or B, with population proportions of γ and $1 - \gamma$, respectively. These political leanings are assumed to be private information, which is the most natural specification for the first years of a democratic regime due to mainly two reasons. First, the previous non democratic regime probably repressed those that had views different from the dictators ideology. Thus, political leanings discrepant from

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the ideology of the regime might have been to a great extent hidden. Second, the events that lead to the fall of a nondemocratic regime and the beginning of a transitional period might considerably shape political attitudes, overall leading to a great deal of uncertainty about who supports whom, especially within the government administration.[7]

District mayors have a preference for village heads that share their same political views, deriving additional utility G for each village head that is ideologically aligned to them.[8] Upon taking office, the district mayor has an opportunity to decide over the continuity in their positions of each appointed village heads.

Let $\phi_v \in \{0,1\}$ be the decision of the district mayor to dismiss or retain, respectively, the incumbent appointed village head of village v. If the mayor decides to dismiss him, she will have to incur in costs c, that capture the disutility of searching for a suitable candidate for the open position. From the point of view of the mayor, the benefit of taking that action is that she will be able to appoint one of her cronies as village head that she knows for sure is aligned to her.[9] Overall, the utility that a district mayor of party A and B, respectively, derives from a village with an appointed village head is:

$$V_A^{app}(\phi,t) = \phi G \mathbf{1}_{\{t=a\}} + (1-\phi)[G - c] \tag{1.1}$$

$$V_B^{app}(\phi,t) = \phi G \mathbf{1}_{\{t=b\}} + (1-\phi)[G - c] \tag{1.2}$$

where $\mathbf{1}_{\{t=j\}}$ is a dummy that takes value 1 if the village head is a party j supporter ($j \in \{a, b\}$),

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[7]Notice that I do not need to assume imperfect information about the political leanings of elected village heads. Since they were selected into office by winning village level elections, we could expect that some information about their political views might have been disclosed at the time of those elections. The results of the model are the same regardless of the informational assumption of political leanings of village heads that are elected. What is important for the model is that the political leanings of appointed village heads are private information, which is a more plausible assumption for the reasons described above.

[8]The parameter G might have a variety of interpretations. It can capture, in a reduced form way, the utility that the mayor derives from his preferred policies being implemented in the village. It can also account for the mayor's expectation of obtaining higher electoral support in subsequent elections from a village in which the village head is a sympathizer of her same party.

[9]Notice that I am assuming that during the democratic period, each party has a group of strong supporters that are committed to the party and there is no uncertainty about their political leanings. However, this group might be small and the costs c captures the opportunity cost of appointing them as village heads and not to alternative jobs. In contrast, during the nondemocratic regime, anyone that wanted to be a village head had to pretend to share the same ideology as the dictator. Hence, giving candidates for village heads strong incentives to hide their real political leanings. The results of the model will still hold if the technology to identify supporters is only slightly better during the democratic period than in the nondemocratic regime, which seems a plausible assumption.

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and 0 otherwise, G is the additional utility that the district mayor obtains when the village head is aligned to her, c are the costs incurred if the incumbent village head is dismissed (which satisfy $G > c$), and ϕ takes value 1 if the mayor decides to retain the village head and 0 otherwise.

Similarly, the utility that a district mayor of party A and B, respectively, derives from a village with an elected village head is:

$$V_A^{elec}(t) = G1_{\{t=a\}} \tag{1.3}$$

$$V_B^{elec}(t) = G1_{\{t=b\}} \tag{1.4}$$

Notice that the only difference between the utility mayors derive from villages with an appointed village head versus those with an elected village head, is that in the latter case the mayor can not dismiss the village head.

I now define the preferences of village heads. If a village head is able to keep his position, he obtains rents R from being in office, whereas if he is fired, he obtains his reservation utility $\underline{U}$. Throughout the paper, I will focus on cases in which village heads are interested in keeping their positions, i.e. $R > \underline{U}$.

During the mayoral electoral campaign, village heads can exert effort to persuade voters in their village to vote for party A or B. The possibility of influencing voter behavior is particularly plausible in the context of the first democratic election. Local patronage networks and other co-option mechanism, which are the cornerstone of many nondemocratic regimes, are likely to still be present at the onset of the first democratic election. To better understand the patterns of political support in new democracies, in this model each village head will decide which candidate to favor when operating the patronage networks under his control. Let $e \in \mathbb{R}$ be the level of effort that a particular village head decides to exert in order to persuade voters to vote for party A: thus, positive (negative) values of e will improve the electoral prospects of party A (B). Exerting effort will be costly for village heads, captured by a twice continuously differentiable cost function $C(.) : \mathbb{R}_+ \to \mathbb{R}_+$, defined over the absolute value of effort satisfying $C(0) = 0$, $C'(|.|) > 0$, $C''(|.|) > 0$.[10] Exerting effort will be more costly for a village head when

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[10]Throughout the paper, in order to minimize notation, I will omit the notation for absolute value from the

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it favors his least preferred candidate. To capture this, a parameter $\overline{\alpha}$ or $\underline{\alpha}$ (satisfying $\overline{\alpha} > \underline{\alpha}$) will multiply the cost function above, depending on the direction of the effort exerted.[11]

Therefore, the utility of an appointed village head that is a party A or party B supporter, respectively, is:

$$U_a^{app}(e,\phi) = \phi R + (1-\phi)\underline{U} - (\overline{\alpha}\mathbf{1}_{\{e<0\}} + \underline{\alpha}\mathbf{1}_{\{e>0\}})C(|e|) \qquad (1.5)$$

$$U_b^{app}(e,\phi) = \phi R + (1-\phi)\underline{U} - (\underline{\alpha}\mathbf{1}_{\{e<0\}} + \overline{\alpha}\mathbf{1}_{\{e>0\}})C(|e|) \qquad (1.6)$$

where ϕ takes value 1 if the village head keeps his position and 0 otherwise, $\mathbf{1}_{\{e<0\}}$ and $\mathbf{1}_{\{e>0\}}$ are indicator functions that take value 1 if effort, e, is negative or positive, respectively, and $C(.)$ is the cost of effort.

Similarly, the utility of an elected village head that is a party A or party B supporter, respectively, is:

$$U_a^{elec}(e) \;=\; R - (\overline{\alpha}\mathbf{1}_{\{e<0\}} + \underline{\alpha}\mathbf{1}_{\{e>0\}})C(|e|) \qquad (1.7)$$

$$U_b^{elec}(e) \;=\; R - (\underline{\alpha}\mathbf{1}_{\{e<0\}} + \overline{\alpha}\mathbf{1}_{\{e>0\}})C(|e|) \qquad (1.8)$$

Notice that the only difference in the preferences of appointed and elected village heads is that the latter ones cannot be fired. Hence, the utility of elected village heads does not depend on which mayor wins the election. This will lead to important differences between the effort exerted by elected and appointed village heads.

Finally, I specify how the effort of village heads affects the electoral outcome. I assume there is common knowledge about the share of the population that has a preference towards party A and denote that proportion by π. There are two other factors that can affect the electoral outcome. First, a valence shock δ uniformly distributed in the interval $[\frac{-1}{2\psi}, \frac{1}{2\psi}]$, which captures the unexpected component of the relative popularity of candidate A with respect to candidate

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cost function, whenever it is obvious from the context that we are considering positive levels of effort.

[11] The introduction of partisan preferences through the cost of effort leads to similar results as introducing an additional payoff for village heads if their preferred party wins the election. However, the current specification permits a cleaner interpretation of the differences in the effort exerted by elected and appointed officials. As it will be discussed later, e is interpreted as the part of effort that comes motivated by the different selection mechanism.

B. ψ is a parameter that measures the density of the valence shock distribution, hence, it is inversely related to the variance of the shock. Second, the sum of efforts of village heads can also have an impact on the electoral outcome. Therefore, the realized vote share of candidate A can be specified in the following way:

$$\tilde{\pi} = \pi + \delta + g(E) \tag{1.9}$$

where E is the sum of the effort levels of all village heads in the district (i.e., $E = \sum_{i=1}^{N} e_i$), $g(.)$ is a twice continuously differentiable function satisfying $g(0) = 0$, $\frac{\partial g(E)}{\partial E} > 0$, which captures how total effort affects the realized vote shares.

Effort of village heads is assumed to be observable to both candidates for mayor.[12] One possible interpretation of this specification is that there is perfect information about the preferences of the median voter in each village and any deviation from that is attributed to the effort exerted by its village head. Also, village heads themselves might have an incentive to make their effort level observable and therefore, might be vocal about it.

The following expression shows the probability that candidate A wins the mayoral election as a function of total effort level:

$$p(E) = \Prob_{\delta} \left[\tilde{\pi} \geq \frac{1}{2} \right] = \psi[\pi + g(E) - \frac{1}{2}] + \frac{1}{2} \tag{1.10}$$

I now proceed to summarize the timing of events.

1. Taking into account π, every village head chooses a level of effort $e_i \in \mathbb{R}$.

2. The electoral outcome is realized and the level of effort that village heads exerted is observed. The candidate for mayor that obtains the largest vote share takes office.

3. The new mayor decides whether to retain or dismiss each appointed village head $\phi_i \in \{0, 1\}$.

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[12] An extension of the model in which effort levels are observed with noise, will be available in the next version of this paper. The main intuitions provided by this model still hold. However, the nature of the pooling equilibrium changes slightly, since one of the type of players will play a pure strategy whereas the other will play a mixed strategy.

4. Payoffs are distributed and the game ends.

1.2.2 Characterization of Equilibria

In this section, I define the solution concept and characterize the set of equilibria. An equilibrium consists on a pair of strategies for the two candidates for mayor, a set of strategies regarding effort decisions for appointed and elected village heads, and a set of beliefs about village head types.

I first describe the optimal effort level that elected village heads exert in any equilibrium. Since the continuity of elected village heads in their positions neither depends on which mayor wins the election, nor on the strategies mayors play, it is straightforward to see that elected village heads do not find optimal to exert effort. The following proposition summarizes this result.

Proposition 1. *In any equilibrium, elected village heads exert zero effort regardless of their political leanings*

$$e_a^{elec} = e_b^{elec} = 0$$

Elected village heads keep their position either if mayor A or mayor B wins the election and at the end of the game they receive payoff R with certainty.

Proof. The level of effort that maximizes the utility of an elected village head of type a, given by (1.7), is $e_a^{elec} = 0$. Similarly, the optimal effort of type b elected village head, given his preferences defined by (1.8), is $e_b^{elec} = 0$. Since even exerting no effort they can keep their positions as village heads, they can not increase their payoffs by choosing any other level of effort.∎

This result should not be interpreted as predicting that elected village heads will never exert effort to support one party or another. They might derive some intrinsic utility from the victory of a particular candidate. Also, district mayors might distribute additional funds to village heads that are aligned to them. In these scenarios, the elected village head might find optimal to exert some amount of effort during the mayoral electoral campaign. However, there is no reason why these additional incentives should not be also present for appointed village heads. One of the objectives of this model is to isolate the level of effort that comes motivated

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by the different selection mechanism, and that is how we should interpret e.

Let us now turn to the game defined by appointed village heads and the two potential candidates for mayor. Notice that effort exerted by appointed village heads has a twofold motivation: first, it can potentially affect the outcome of the election and second, it can signal a particular political affiliation. When analyzing the optimal behavior of an appointed village head, the setting constitutes a dynamic game of incomplete information, more specifically a *signaling game* between the village head and the two potential candidates for mayor. The solution concept I use to solve this game is Perfect Bayesian Equilibrium and I refine the set of equilibria using the Intuitive Criterion.

Solution Concept

Definition 1. A *Perfect Bayesian Equilibrium* (PBE) of this game consists on a set of optimal strategies for both candidates for mayor $\phi_m^*(e_i) \in \{0,1\}$ $m \in \{A,B\}$, a set of optimal strategies for each appointed village head $e_i^*(t) \in \mathbb{R}$ $t \in \{a,b\}$, and a set of posterior beliefs $\mu(t|e_i)$ such that

$$\phi_m^*(e_i) \in \arg\max_{\phi} \left\{ \Sigma_t \mu(t|e_i) V_m^{app}(\phi,t) \right\} \tag{1.11}$$

$$e_i^*(t) \in \arg\max_{e_i} \{p(E_{-i}+e_i)U_t^{app}(e_i,\phi_A^*(e_i)) + (1-p(E_{-i}+e_i))\, U_t^{app}(e_i,\phi_B^*(e_i))\} \tag{1.12}$$

where $\mu(t|e_i)$ is derived from the prior (population shares), e_i, and $e_i^*(t)$ using Bayes' rule (when applicable), $V_m^{app}(\phi,t)$ $m \in \{A,B\}$ are defined by (1.1) and (1.2) respectively, $U_t^{app}(e,\phi)$ $t \in \{a,b\}$ are defined by (1.5) and (1.6) respectively, $p(.)$ is defined by (1.10), and E_{-i} is the aggregate effort level of all village heads other than i, i.e., $E_{-i} = \sum_{j\neq i} e_j$.

In the rest of this section, I characterize the set of equilibria of this game, focusing on the interaction of appointed village heads and the two candidates for mayors.[13] Therefore, in order to minimize the use of notation I will drop the superscript *app*, which stands for appointed village head.

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[13]Since elected village heads always exert zero effort they do not play any role in this game.

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Mayor Optimization Problem

Upon taking office the new mayor decides, based on the observed levels of effort, whether to keep or dismiss each appointed village head in her jurisdiction. She will decide to keep a particular village head as long as the expected utility from doing so is higher than the expected utility of dismissing him. By noting that the utility function of mayor A is given by (1.1), it is straightforward to see that she will find optimal to keep a village head that exerts effort e as long as the following holds:

$$\mu(t = a|e)G > G - c \tag{1.13}$$

where $\mu(t = a|e)$ is the posterior probability that a village head is type a given that he exerted effort level e. Mayors derive this posterior probability using Bayes' rule when applicable.[14] Similarly, if the candidate for mayor of party B takes office, she will keep the village head as long as $[1 - \mu(t = a|e)]\, G > G - c$. Therefore, notice that their decisions depend on their assessment of how likely is the village head to be politically aligned to them, and on the relative benefits of an aligned village head relative to the costs of firing.[15]

Pooling Equilibria

Next, I analyze the set of pooling PBE of this game, in which both types of village heads exert the same level of effort $e^*(t) = \widehat{e}$ for $t \in \{a, b\}$. Notice that, mayors will not be able to update their prior along the equilibrium path. Consequently, mayors will equate the posterior probability of a village head being of a particular type to the corresponding population share of that type i.e., $\mu(t = a|\widehat{e}) = \gamma$. By plugging this probability in the optimal decision rule of the mayor A given by (1.13), it is straightforward to see that mayor A will find profitable to keep a village head that exerted effort $\widehat{e}$ as long as $\gamma > \frac{G-c}{G}$. Similarly, mayor B will keep a village head that exerted effort $\widehat{e}$ if $1 - \gamma > \frac{G-c}{G}$. Hence, depending on how the proportion of

---

[14]In this setup, the Bayes' rule is $\mu(t = a|e) = \frac{P(e|t=a)\gamma}{P(e|t=a)\gamma + P(e|t=b)(1-\gamma)}$, where $P(e|t)$ is the probability that an appointed village head of type t exerts level of effort e. If e is an action taken along the equilibrium path, this probability is determined by the strategies played in equilibrium. However, if e is not played along the equilibrium path, the Bayes' rule does not pin down the posterior probability.

[15]Given the timing of events, mayors cannot commit to implement any strategy different than their optimal one upon being elected. Otherwise, they might find optimal to offer a more sophisticated contract to village heads during the electoral campaign. This is why the preferences of mayors that are relevant are those at an interim stage, i.e., after being elected.

each type of village head relates to the ratio $\frac{G-c}{G}$ different strategies of mayors can be sustained in equilibrium. In this subsection I examine the following set of parameters.

CASE 1.

$$\gamma > \frac{G-c}{G} > 1 - \gamma \tag{1.14}$$

In this case, the proportion of type a village heads is particularly high. As I describe below, pooling equilibria will be sustained in this set of parameters if the underlying support for party A is high enough. In the Appendix I discuss the opposite case, in which the proportion of type b village heads is high and pooling equilibria emerge provided that the underlying support of party B is high enough. Since the underlying support of a party in the population is likely to be positively correlated with the proportion of appointed village heads that are sympathizers of that party, these are the most relevant parameter sets in which pooling PBE might emerge. Therefore, in the rest of the paper I will focus on pooling equilibria for emerges for these two cases.[16]

Consider the following strategies and beliefs as a candidate for PBE of this game for Case 1:[17,18]

$$
\begin{aligned}
\phi_A^*(e) &= \begin{cases} 1 \text{ if } e = \widehat{e} \\ 0 \text{ if } e \neq \widehat{e} \end{cases} \\
\phi_B^*(e) &= \begin{cases} 0 \text{ if } e = \widehat{e} \\ 1 \text{ if } e \neq \widehat{e} \end{cases} \\
e_i^*(t) &= \widehat{e} \geq 0 \text{ for } t \in \{a, b\} \\
\mu(t = a | e = \widehat{e}) &= \gamma \\
\mu(t = a | e \neq \widehat{e}) &= 0
\end{aligned}
\tag{1.15}
$$

---

[16]For completion, the set of pooling equilibria that might emerge for other sets of parameters is also analyzed in the Appendix.

[17]Notice that in equilibrium all village heads of a particular type will exert the same level of effort. This result is derived from the symmetry of their optimization problems and will be common to all equilibria described in this paper. In order to minimize notation, oftentimes I will omit the i subscript. However, when checking for deviations from the equilibrium path I consider the deviation of a single individual of a particular type, holding constant the actions of any other village head of either type.

[18]I focus on the set of equilibria in which village heads' effort is aimed at supporting candidate A, i.e. $\widehat{e} \geq 0$. There can be pooling PBE with associated $\widehat{e} < 0$, but these peculiar equilibria in which village heads support party B but only party A hires them, do not satisfy the Intuitive Criterion and I do not discuss them further.

Therefore, along the equilibrium path, if mayor A wins the election, she keeps all the appointed village heads, whereas if mayor B is elected, she fires all of them. Notice that these strategies are sustained because the proportion of type a village heads is high, relative to the proportion of type b village heads. Since type b village heads have higher costs of exerting positive effort, they are the most likely ones to deviate from their equilibrium strategy. Let e'_b be the most profitable deviation of a particular type b village head, given that every other village head is exerting effort $\widehat{e}$.[19]

$$e'_b = \arg\max_{e \leq 0} \{[1 - p([n\text{-}1]\,\widehat{e}+e)]\,(R - \underline{U}) - \underline{\alpha}C(|e|)\} \tag{1.16}$$

Village head type b will not find profitable to deviate as long as:

$$p(E^*)(R - \underline{U}) - \overline{\alpha}C(\widehat{e}) \geq \left(1 - p(E')\right)(R - \underline{U}) - \underline{\alpha}C(|e'_b|) \tag{1.17}$$

$$\pi \geq \frac{1}{2\psi\,[R\text{-}\underline{U}]}\left[\psi\,[R\text{-}\underline{U}]\left(1 - g(E^*) - g(E')\right) + \overline{\alpha}C(\widehat{e}) - \underline{\alpha}C(|e'_b|)\right] \tag{1.18}$$

where $E^* = n\widehat{e}$ is total effort in equilibrium, $E' = [n\text{-}1]\,\widehat{e}+e'_b$ is total effort if a village head type b deviates, and the last inequality follows by plugging in the expression for the probability that party A wins the election, given by (1.10).

A number of features from the above expressions are worth noticing. First, the stronger is the underlying support for party A in a district (higher π) the more likely is this equilibrium to exist. This result is actually very intuitive: when the election is expected to be very lopsided, all the appointed village heads have a strong incentive to pretend to be supporters of the likely winner. Second, the lower the level of effort required to exert in equilibrium, $\widehat{e}$, the more likely is this equilibrium to exist. A low required effort minimizes the incentives that type b has to deviate. Third, the smaller are the differences in costs of effort $\overline{\alpha} - \underline{\alpha}$, the more likely is this equilibrium to exist. Hence, there can not be strong partisan preferences among village heads, otherwise it would be very costly for village heads to support their least preferred candidate, giving them strong incentives to deviate.

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[19]The optimal deviation necessarily satisfies $e'_b \leq 0$, since deviating to $e' > 0$ is always dominated by deviating to $e' = 0$: both lead to the same actions of mayors, but in the latter case the village head saves the cost of effort.

Notice that the set of PBE is very large, since there can be infinitely many levels of effort that satisfy inequality (1.18). However, some of these pooling equilibria are sustained by out of equilibrium beliefs that are not always reasonable. A standard practice in this type of games is to apply some refinement to the equilibrium concept. In particular, I consider the Intuitive Criterion first formalized by Cho and Kreps (1987). The application of this refinement eliminates many pooling PBE.[20] However, the following level of effort is associated to a PBE that satisfies the Intuitive Criterion.[21]

$$\frac{\partial g(ne_a^*)}{\partial E} \psi \left[R - \underline{U} \right] = \underline{\alpha} C'(e_a^*) \tag{1.19}$$

This effort level maximizes the expected payoffs of type a and there is no deviation that could make type a better off, for any possible out of equilibrium beliefs.[22] Therefore, if there was some deviation, mayors should deduce the village head is type b. Hence, type b could potentially reveal his type by undertaking certain deviations. However, it would never be in his best interest to do so. Upon revealing his type, the best response of mayor A would be to dismiss him and only mayor B would be willing to keep him. Since inequality (1.17) holds, this is not profitable for type b. In other words, type a is getting his maximum payoff and could not reveal his type by deviating to an alternative level of effort. On the contrary, type b could reveal his type by undertaking certain deviations but he would never want to do so. Consequently, the pooling equilibrium described above satisfies the Intuitive Criterion. Notice that there might be other PBE that also satisfy the Intuitive Criterion.[23] However, the equilibrium above is the only one that also satisfies stronger equilibrium refinements, such as Universal Divinity (Banks

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[20] See the proof of Proposition 2 in the Appendix for the definition of the Intuitive Criterion and its application to the current setup.

[21] This is under the assumption that there is an interior solution, i.e. $\frac{\partial g((n-1)e_a^*)}{\partial E} \psi \left[R - \underline{U} \right] > \underline{\alpha} C'(0)$.

[22] Effort level e_a^* is defined such that, conditional on all other appointed village heads exerting effort level e_a^*, the optimal deviation of type a is exactly to effort level e_a^*. In particular, $e_a^* = argmax \{ p((n\text{-}1)e_a^*+e)(R\text{-}\underline{U}) - \underline{\alpha} C(e) \}$. This ensures type a does not have a profitable deviation for any out of equilibrium beliefs. Also notice that this optimal level of effort is maximizing the expected utility of the village head. Hence, village heads will take into account the impact of their effort on the electoral outcome. In other words, they not only have the signaling motivation of effort, but also some electoral motivation. For further discussion see the proof of Proposition 2 in the Appendix.

[23] For instance, consider a PBE associated to a very large level of effort. Both types would be better off by deviating (conditional on mayors revising their out of equilibrium beliefs). But since both types would benefit from doing so, they can not reveal their type undertaking such deviations.

and Sobel (1987)).[24] The following proposition summarizes these results.

Proposition 2. *If condition* $\gamma > \frac{G-c}{G} > 1 - \gamma$ *is satisfied, for each* $\widehat{e} \geq 0$ *such that inequality (1.17) holds, the set of strategies and beliefs specified in (1.15) constitutes a pooling Perfect Bayesian Equilibrium of this game. In this equilibrium, all appointed village heads exert effort* $\widehat{e}$ *and along the equilibrium path both keep their positions if candidate for mayor A wins the election and are dismissed otherwise. The PBE associated to level effort* e_a^* *defined by (1.19) satisfies the Intuitive Criterion.*

Proof. In the Appendix.

Separating Equilibria

Let us now turn to describe the set of separating equilibria in which each type of village head takes an action perfectly distinguishable from the action of the other type. Hence, along the equilibrium path, types will be truthfully revealed and mayors are able to identify and only retain those village heads that are aligned to them. Let n_a (n_b) be the number of appointed village heads that are type a (type b).[25] Consider the following set of strategies and beliefs as a candidate for separating PBE of this game.

$$
\begin{aligned}
\phi_A^*(e) &= \begin{cases} 1 \text{ if } e \geq 0 \\ 0 \text{ if } e < 0 \end{cases} \\
\phi_B^*(e) &= \begin{cases} 0 \text{ if } e \geq 0 \\ 1 \text{ if } e < 0 \end{cases} \\
e_i^*(t = a) &= e^{*s} \\
e_i^*(t = b) &= -e^{*s} \\
\mu(t = a | e) &= \begin{cases} 1 \text{ if } e \geq 0 \\ 0 \text{ if } e < 0 \end{cases}
\end{aligned}
\tag{1.20}
$$

---

[24] A formal proof will be provided in the next version of the paper. The main intuition of why the divinity criterion eliminates PBE other than the one associated to e_a^*, is that in those other equilibria, type a will always be more likely to deviate be to deviate to e_a^* than type b.

[25] Therefore, the proportion of appointed village heads that are type a is $\gamma = \frac{n_a}{n}$ and type b is $1 - \gamma = \frac{n_b}{n}$.

where e^{*s} is implicitly defined by

$$\frac{\partial g([n_a\text{-}n_b]\,e^{*s})}{\partial E}\psi\,[R - \underline{U}] = \underline{\alpha}C'(e^{*s}) \tag{1.21}$$

Notice that given the specified out of equilibrium beliefs, mayor A will retain any village head that exerts a positive level of effort. Therefore, the action that type a takes in equilibrium needs to maximize his expected payoffs when the effort of the rest of village heads is taken as given. Similarly for type b. This is the case when they exert the level of effort defined by condition (1.21). The following additional conditions ensure that type a does not want to pretend to be type b by deviating to a negative level of effort, and vice versa.

$$p(E^{*s})(R - \underline{U}) - \underline{\alpha}C(e^{*s}) \geq \left(1 - p\left(E'_a\right)\right)(R - \underline{U}) - \overline{\alpha}C(|\widetilde{e}_a|) \tag{1.22}$$

$$\pi \geq \frac{1}{2\psi(R\text{-}\underline{U})}\left[\psi(R\text{-}\underline{U})\left(1 - g(E^{*s}) - g(E'_a)\right) - \overline{\alpha}C(|\widetilde{e}_a|) + \underline{\alpha}C(e^{*s})\right] \tag{1.23}$$

where $E^{*s} = [n_a\text{-}n_b]\,e^{*s}$ is total effort in equilibrium and $E'_a = [n_a\text{-}n_b\text{-}1]\,e^{*s}+\widetilde{e}_a$ is the total effort if a type a village head deviates, and $\widetilde{e}_a$ is type a's optimal deviation defined by

$$\widetilde{e}_a = \arg\max_{e<0}\left\{[1 - p([n_a\text{-}n_b\text{-}1]\,e^{*s}+e)](R - \underline{U}) - \overline{\alpha}C(|e|)\right\} \tag{1.24}$$

Similarly, type b will not have incentives to deviate to positive levels of effort if the following holds:

$$\pi \leq \frac{1}{2\psi(R\text{-}\underline{U})}\left[\psi(R\text{-}\underline{U})\left(1 - g(E^{*s}) - g(E'_b)\right) + \overline{\alpha}C(\widetilde{e}_b) - \underline{\alpha}C(e^{*s})\right] \tag{1.25}$$

where $E'_b = [n_a\text{-}n_b\text{+}1]\,e^{*s}+\widetilde{e}_b$ is the total effort that emerges if type b village head deviates, and $\widetilde{e}_b$ is type's b optimal deviation defined by

$$\widetilde{e}_b = \arg\max_{e\geq 0}\left\{p\left([n_a\text{-}n_b\text{+}1]\,e^{*s}+e\right)(R - \underline{U}) - \overline{\alpha}C(e)\right\} \tag{1.26}$$

The following proposition summarizes these results.

Proposition 3. *If conditions (1.23) and (1.25) hold, the set of strategies and beliefs specified in (1.20) constitutes a separating Perfect Bayesian Equilibrium of this game. In this equilibrium*

type a appointed village heads exert effort e^{*s} as defined by (1.21), type b appointed village heads of exert effort $-e^{*s}$, mayor A only retains appointed village heads that exerted effort e^{*s}, and mayor B only retains appointed village heads that exerted effort $-e^{*s}$. This equilibrium satisfies the Intuitive Criterion.

Proof. In the Appendix.

A number of features are worth noticing from this proposition. First, π, the underlying strength of party A in the district, needs to take intermediate values for this equilibrium to exist. In other words, separating equilibria will emerge when the election is expected to be contested. Intuitively, both candidates for mayor need to have some chance of winning the election. Otherwise, village heads would have strong incentives to support their least preferred candidate if she is very likely to win. Second, notice that for separating equilibria to exist, the difference in costs of supporting the most preferred candidate versus the least preferred one, i.e. $\overline{\alpha} - \underline{\alpha}$, needs to be high enough. Thus, there needs to be strong enough partisan differences among village head to sustain a separating equilibrium. Otherwise, village heads will have incentives to deviate to support their least preferred candidate even if she is only slightly more likely to win.

1.2.3 Aggregate Effects

With the objective of obtaining empirically testable predictions, in this section I investigate how the aggregate level of effort of appointed village heads depends on the characteristics of each district. The following proposition summarizes the previous results and describes what will be the level of aggregate effort exerted in each district, when focusing on equilibria which satisfy the Intuitive Criterion:

Proposition 4.

1. *If condition $1 - \gamma > \frac{G-c}{G} > \gamma$ holds and π is low enough (inequality (1.31) is satisfied), a pooling PBE emerges in which all appointed village heads exert effort to support party B. Total effort in the district will be $-ne_a^* < 0$ where e_a^* is defined by (1.19).[26]*

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[26] *See the Appendix for the discussion of pooling PBE for this set of parameters.*

2. *If π takes intermediate values (inequalities (1.23) and (1.25) hold), a separating PBE emerges. Total effort in the district will be $n_a e^{*s} - n_b e^{*s}$ where e^{*s} is defined by (1.21).*

3. If condition $\gamma > \frac{G-c}{G} > 1 - \gamma$ holds and π *is high enough (inequality (1.17) is satisfied), a pooling PBE emerges in which all appointed village heads exert effort to support party A. Total effort in the district will be $n e_a^* > 0$ where e_a^* is defined by (1.19).*

Proof. Statement 1 follows from Proposition 5 in the Appendix. Statements 2 and 3 follow from Propositions 3 and 2, respectively.■

As the proposition above highlights, π, the relative strength of party A in a district, plays a crucial role in determining whether a pooling or a separating equilibrium emerges. However, π can also affect the aggregate level of effort by other channels. First, the productivity of effort is likely to be higher when the election is expected to be contested, since it should be easier to persuade citizens to vote for a particular candidate when there is a higher probability that their vote is going to be pivotal. To account for this let us consider that the function $g(.)$, which captures the how effort affects the vote shares, also depends on π, i.e. $g(E, \pi)$. In particular let us assume that it takes the following form $g(E, \pi) = E \cdot h(\pi)$, where $h(\pi)$ is maximized when $\pi = \frac{1}{2}$. Under this assumption, the individual level of effort exerted in equilibrium, as defined by (1.19) and (1.21) will be a function of π which has an inverse U-shape form maximized at $\pi = \frac{1}{2}$.

A second feature that might change across districts is the ideological composition of village heads. We would expect π and γ to be positively correlated since districts in which one of the parties has strong popular support, might also have a substantial proportion of village heads that are sympathizers of that party. After all, village heads are a subgroup of the population. Still appointed village heads are probably not a random sample, since they were appointed by the dictator's party (party A) during the nondemocratic regime. Therefore, it is likely that at any district the proportion of village heads that are party A sympathizers outnumbers their population counterpart.

Figure 1 summarizes these two additional assumptions. On the left panel, the optimal individual effort is plotted as a function of the underlying strength of party A, i.e. π. Similarly, the panel on the right shows how the proportion of village heads that are party A sympathizers

might depend on π.

The introduction of these two assumptions permits us to obtain specific predictions about how aggregate effort differs across regions. As I will discuss in the empirical section, the data exhibits a heterogenous pattern substantially similar to the one predicted when these two additional assumptions are established, which is reassuring of the assumptions introduced. The following result summarizes these assumptions and describes their implications.

Result 1. Under the following additional assumptions

1. $g(e, \pi) = E \cdot h(\pi)$ where $h'(.) > 0$ if $\pi < \frac{1}{2}$, $h'(.) < 0$ if $\pi > \frac{1}{2}$ and $h''(.) < 0$.

2. $\gamma(\pi)$ satisfies $\gamma'(.) > 0$ and $\gamma(\pi) > \pi \ \forall \pi$

the aggregate effort described in Proposition 4 has a pattern as described in Figure 2.[27]

Figure 2 plots how aggregate effort depends on π, as described by Proposition 4, when these two assumptions are taken into account. A number of features are worth emphasizing. First, notice that, even when the equilibrium is separating, the high proportion of appointed village heads that are supporters of the dictator's party (party A) can lead to aggregate levels of effort that are positive. Only if the reformist party is expected to win by a large margin we would expect to obtain an unambiguous negative aggregate effect (i.e., appointed village heads giving their support to party B). Second, the difference in aggregate effort between pooling and separating equilibria might not be too high. Even though in pooling equilibria all village heads exert effort in the same direction, they might be coordinating in low levels of effort. Therefore, I do not expect to find a discontinuity in the data that would enable me to test for the type of equilibria.

1.2.4 Summary of Empirical Predictions

In this subsection I summarize the empirical predictions of the theory described.

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[27]See section 9.4. in the Appendix for a more detailed discussion on this Result. When these additional assumptions are introduced, there are no longer closed form solutions for the thresholds of separating and pooling equilibria. As long as n is large enough and function $h(.)$ is not too sensitive to changes in π, the thresholds are well behaved.

1. In most regions, the aggregate level of effort of appointed village heads favors the dictator's party, especially in regions where it has a strong underlying support in the population.

2. The effect is reversed in regions where the reformist party is expected to win by a large margin. In those regions appointed village heads support the reformist party.

3. If assumptions 1 and 2 of Result 1 are satisfied, the aggregate level of effort, as a function of the underlying strength of the dictator's party, has an heterogenous pattern as displayed in Figure 2.

In Section 5 of this paper, I test these empirical predictions with data from the Indonesian first democratic election post-Suharto. I compare the electoral outcome between villages with an elected village head and those with an appointed village head, within districts and when the main determinants of voting behavior are controlled for. By focusing on this comparison, I attempt to capture the differences in their voting patterns that can be attributed to the behavior of their village heads. The empirical results corroborate, to a great extent, the predictions of the model. In particular, the data reflects an heterogenous pattern similar to the one described in Figure 2. This finding is particularly noteworthy, because alternative explanations that rely on the existence of unobserved heterogeneity between these two types of villages can not account for this pattern.

Finally, I will examine the consequences of the pooling and separating equilibria in the second election and provide some suggestive evidence in Section 7.

1.3   Overview of the Indonesian Political Structure

1.3.1   Political Situation

The regime of General Suharto, also known as New Order, lasted more than thirty years from 1966 to 1998. During this period elections were held every 5 years for the legislatures at the national, provincial, and district level starting in 1971. However, these elections were far from being expressions of popular sovereignty. Only moderate and highly controlled by the government opposition parties were allowed to participate in these elections and Golkar (Functional Groups), Suharto's electoral machinery, was always the overwhelming winner, achieving vote

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shares between 63% and 75%. In contrast, opposition parties PDI (Indonesia Democracy party) and PPP (Development Unity Party) obtained vote shares ranging from 3% to 15% and 16% to 29%, respectively.[28]

Several scholars have pointed out that one of the most important reasons behind these electoral results were the extensive use of local patronage networks, voter intimidation and vote buying practices, usually rooted at the village level (see for instance Evers (2000), King (2003), Haris (2004), Antlöv (2004)). These practices took a variety of forms: from rewarding villages with two heads of cattle if Golkar obtained a large victory in the village (Evers (2000)), to threatening voters with sanctions or with being accused of subversion if they did not vote for Golkar (Haris (2004)). The key actors of these mechanisms of voter cooptation were village heads, who had the mandate of mobilizing voters to support Golkar and were rewarded or punished by upper levels of governments based on the village electoral results (Antlöv (2004)). Golkar took advantage of the whole structure of this patronage state, while PPP and PDI had very limited means and were not even able to campaign below the subdistrict level.

On March 1998, the imminent re-appointment of Suharto as President for a 7th consecutive term by his rubber-stamp Parliament sparked protests and riots throughout the country. Discontent with the regime had mounted due to the rampant corruption levels, which in many cases involved Suharto's own family, together with the economic erosion produced by the Asian Economic Crisis of 1997. This general lack of confidence made Suharto lose crucial supports and he was finally forced to step down on May 1998.

After the fall of Suharto, a transitional government was established and several reforms were implemented. One of the most important ones was the initiation of a process of political and fiscal decentralization that transferred significant decision rights and spending capabilities to the districts (Hofman and Kaiser (2006)).

The first democratic election of the post-Suharto era took place in June of 1999. On the same day, elections were held for the national, provincial and district legislatures, although there were very few split votes.[29] The two parties that were considered more likely to win

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[28] The first election of the New Order in 1971 was slightly different. Ten parties were allowed to participate but still Golkar obtained 62.8% of the votes. In the next elections the nine opposition parties were forced to merge in just two. PNI, Murba, IPKI, Partai Katolik, and Parkindo were forced to form PDI, while NU, Parmussi, PSS, and Peri were merged into PPP.

[29] These legislatures elected, in turn, the head of the executive of the corresponding level of government.

the election were PDI-P[30] and Golkar. PDI-P campaigned on the necessity of deepening the democratic reforms whereas Golkar represented the continuity of Suharto's policies and the persistence of the autocratic status quo. PDI-P was able to obtain the largest vote share, with 33.7% of the votes. Still Golkar obtained the second position with 22.4% of the votes.[31]

Although the elections seemed fair on the surface, many analysts pointed out that more subtle co-option mechanisms were still in place. In particular, patronage networks rooted at the village level were active and there were multiple reports of electoral violations related to vote buying and money politics (King (2003), Antlöv (2004), Hadiz (2004)).

PDI-P failed to form the necessary Parliamentary majority in order to obtain the presidency for their leader, Megawati Sukarnoputri. Instead, Abdurramah Wahid, the leader of PKB was elected President with the support of Golkar and other non-elected members of parliament, mostly from the military and the security forces. However, two years later in June 2001, several student protests forced Wahid to resign and Megawati Sukarnoputri finally assumed the presidency. During that period, Indonesia experienced significant reforms including a new set of electoral rules that eliminated non-elected members of Parliament and introduced direct elections for the President and for the heads of the executive government at the provincial and the district level.

Still the government of Megawati Sukarnoputri disappointed many of their supporters and PDI-P significantly lost ground with respect to the other political forces, as reflected by the electoral outcome of the second parliamentary election held in April 2004. PDI-P lost their first position to Golkar, which obtained 21.6% of the votes. PDI-P's vote share dropped to 18.5%.[32] However, none of the mayor parties were able to obtain the presidency: Susilo Bambang Yud-hoyono, the leader of a new party called PD (Democratic Party), which only obtained 7.5% of the votes in the Parliamentary election, won the presidency from Megawati Sukarnoputri in the second round of the presidential election on September 2004.

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[30]PDI-P contested the elections during the New Order under the acronyms PDI.

[31]The following most voted parties were PKB (National Awakening Party), PPP and PAN (National Mandate Party) with respective vote shares of 12.7%, 10.7% and 7.1%, and the rest of parties obtained fewer than 2% of the votes.

[32]PKB obtained 10.6% of the votes and the rest of parties obtained fewer than 10% of the votes each.

1.3.2 Organization of the State

At the time of the first democratic election, Indonesia was divided into 27 provinces and each province was divided in districts, of which there were 306.[33] Even though there have been changes in the number of regions, the structure of the state and the typology of the divisions has remained the same throughout the decentralization and democratization period. There are two types of districts: *kota* or urban districts (63 in 1999) and *kabupaten* or rural districts (243 in 1999). Each district is divided into *kecamatans* or subdistricts and each subdistrict is in turn divided into villages, which are the lowest subdivision of the administration. There are two types of villages: *desa* which tend to be more rural and *kelurahan* which are more urban.[34] Most of the villages in *kota* districts and other cities are *kelurahan* while *kabupaten* districts are formed mostly by *desa*.

The classification of villages into *desa* and *kelurahan* started after the approval of the Village Law No. 5 of 1979. This law aimed to achieve governmental uniformity at the village level throughout Indonesia. Before 1979, village government varied across regions and its organization was based largely on local customs (Kato (1989)). By default villages were classified as *desa* and the process of *kelurahan* formation was conducted in a centralized way by the Ministry of Home Affairs. *Kelurahans* could be formed in *kota* districts, in the capital of *kabupaten* districts and in the capital of each *kecamatan* or subdistrict. Although ministerial decrees specified some requirements that villages had to satisfy in order to be classified as *kelurahan*, none of them was quantitative. Still, there is no evidence that the classification was driven by political considerations and in Section 6 I will show some results that support this claim.[35]

There are also some differences between *desa* and *kelurahan* villages regarding their village

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[33]The number of districts substantially increased during the decentralization period, going from 306 in 1999 to 434 in 2003.

[34]*Kelurahan* are oftentimes refered as "urban wards", since most of them are located in cities.

[35]In order to obtain more details on how was this classification conducted, I interviewed several high ranking officials of the Ministry of Home Affairs at Jakarta that were involved in the classification. They pointed out that they did not follow any more specific criteria other than the guidelines stated in the law and ministerial decrees. Although I did not directly ask whether there were political considerations in the classification, I asked whether *kelurahan* formation was encouraged or discouraged in certain areas (support for Golkar varied considerably across regions). According to them, all areas were treated equally and that they only considered the level of urbaness for *kelurahan* formation (this is corroborated by my data analysis). They did also mention that the main constrain for *kelurahan* formation was the additional financial burden for the central government, since the *kelurahan* head has the status of civil servant and hence had to be on the government payroll.

government structure. The village head of *desa* was elected by villagers every 8 years for a maximum of 2 terms,[36] whereas the village head of *kelurahan* is appointed by the head of the district. De *jure*, *desa* government institutions have some authority over local affairs and over the village budget. However, some scholars have suggested that during Suharto's regime, most of the decisions were de *facto* taken by higher levels of government (Evers (2000)). *Kelurahan* village government is managed in a more top-down fashion and the *kelurahan* head is a government official. The head of the district has the appointment rights of the *kelurahan* heads in their district. During Suharto's regime, the decisions relative to the appointment and dismissal of *kelurahan* heads (and other civil servants) were centrally controlled by the Ministry of Home Affairs. However, during the decentralization period, extensive rights were transferred to the districts. In particular, the approval of Law no. 22 of 1999 (one month before the first democratic election was held) gave to the head of the districts rights to conduct appointment, transfer, dismissal, stipulation of pension, salary, among other benefits of civil servants in their jurisdiction.[37] Therefore, *kelurahan* heads should have had substantial interests in the electoral outcome of the first democratic election at the district level.

1.3.3 Local Politics and Persistence of Patronage Networks Post-Suharto

Many authors have highlighted that practices of voter cooptation and the presence of patronage networks have persisted after the fall of Suharto (see Antlöv (2004), King (2003), Robinson and Hadiz (2004), Schiller (2009), Sulistiyanto (2009)). For instance, Hadiz (2004) quite explicitly summarizes this view:

> "The most notable aspect of this constellation is that predatory interests nurtured under Suharto regime's formerly vast, centralized system of patronage - which extended from the Presidential Palace in Jakarta down to the provinces, towns and villages - have largely survived and remained intact."

Furthermore, some scholars argue that vote buying has become an even more extended practice post Suharto: since government officials and politicians can no longer use the threat

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[36] With the implementation of Law no. 22 of year 1999, the term limit of *desa* heads was changed to a maximum of ten years or two terms of service (Article 96).

[37] Article 76 of Law no. 22 of 1999.

of repression for voter cooptation, they now rely on vote buying to obtain support. Village heads remain the key actors in the patron-client network structure. In the last Special Report on Indonesia published by The Economist (2009), they argue that these mechanisms have persisted.

> "Money does play a big part, and at the village level many voters are subject to blandishments or intimidation from the local headman, who may in turn have been promised rewards or threatened with sanctions by politicians in higher tiers of government."

Overall, there is substantial evidence that the mechanism of voter cooptation that village heads had during the Suharto's regime have largely persisted, and therefore must have been present at the onset of the first and second democratic elections.

1.4 The Data

1.4.1 Data Sources

The most important data source used in this paper is the Census of Villages data sets (*Potensi Desa*, PODES), which are conducted every 3-4 years by the Statistics Agency of Indonesia (*Badan Pusat Statistik*). Interviews are conducted to the whole universe of 66,000 villages of Indonesia and contain information on a wide variety of village characteristics. For the purpose of this paper, I use the 1996, 2000, 2003 and 2005 waves. My measure of electoral outcome at the village level for the 1999 and 2004 Parliamentary elections comes from two questions in the 2003 and 2005 waves, respectively, that asked which were the three most voted parties in the previous legislative election. Therefore, although I do not have the vote shares obtained by the different parties at the village level, the ranking of the three most voted parties serves as an approximation. In the regressions for the 1999 electoral outcome I use as controls several variables from the 1996 wave of the PODES survey, since this is the wave prior to the election that is the closest in time. Likewise, in the regressions on the 2004 election I use as controls the variables from the 2003 PODES.

The data on the electoral results at the district level was provided by the Electoral Com-

mission of Indonesia (KPU).[38] Other additional data sources used for some of the robustness checks are described in the Data Appendix.

The model described in Section 2 leads to different empirical predictions regarding the effort exerted by appointed village heads relative to the effort of elected village heads to support the dictator's party. My measure of the relative effort level is the difference in electoral support for Golkar between *kelurahan* and *desa* in a given district, when the main determinants of vote behavior are controlled for.

1.4.2 Descriptive Statistics

Table 1 shows the descriptive statistics. The first column reports the number of observations in the sample and columns 2 and 3 show the mean and the standard deviation of each variable for the whole sample. Although the number of villages in Indonesia is approximately 66,000, I am able to use around 37,000 in my analysis due to several reasons. First, the matching across the different waves of the PODES surveys is based on the name of the village and the name of the district. There are approximately 18,000 villages which do not provide an exact match across the different waves of the PODES survey. Second, in order to ensure that my results are not driven by few observations I restrict the sample to districts in which there are more than 5 *kelurahan* or more than 5 *desa*. This further reduces the sample by 11,000 additional observations.[39] The reason why so many observations are dropped is because in some urban districts or *kota* all the villages are *kelurahan*, that is the case for instance of the capital city of Jakarta. In some other rural districts or *kabupaten*, all the villages I am able to match across the different PODES waves are *desa*. Since my empirical strategy will be comparing *desa* and *kelurahan* within districts, the lack of common support in those districts will prevent estimating the effect.

Still, for historical reasons there is some overlap in the sample, which permits undertaking a relevant econometric comparison. As mentioned above, the Village Law No. 5 of 1979 allowed the creation of *kelurahan* in the surroundings of the capital of the subdistrict even in quite

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[38]This second source of electoral data contains information on the vote shares that parties obtained in each district, which allows me to check my measure of electoral result at the village level. Both sources lead to broadly consistent results.

[39]See the Data Appendix for further details.

rural districts.[40] Therefore we observe some kelurahan that have rural characteristics. Also, in 1992 the Ministry of Home Affairs stopped the conversions of *desa* into *kelurahan* as they became more urban (Niessen (1999)).[41] This also explains why some villages in our sample are classified as *desa* despite being quite urban based on their observable characteristics.

Columns 4 and 5 correspond to the descriptive statistics for *kelurahan* villages and columns 6 and 7 for *desa* villages. *Kelurahan* and *desa* differ on several dimensions, therefore controlling for a wide set of characteristics will be important for the validity of the empirical analysis. The first ten rows correspond to the electoral results at the village level for the 1999 and 2004 Parliamentary elections. Golkar won more often in *kelurahan* than in *desa* villages, especially in the 2004 election. In contrast, PDI-P and the other smaller parties are more likely to win in *desa* villages. The following rows correspond to the variables used as controls in the main specifications of the regressions. The descriptive statistics of the geographic characteristics corroborate that *kelurahan* villages tend to be more urban than *desa*. 57% of *kelurahans* are classified as urban according to the Statistics Agency of Indonesia, whereas only 7% of *desa* fall on that category. *Kelurahan* villages tend to have fewer households whose main occupation is in agriculture, fewer percentage of the village land dedicated to agricultural uses, higher population and population density, and they tend to be closer to the capital of the subdistrict. However, the average *kelurahan* in our sample is still quite rural, with 55% of their land devoted to agricultural activities. Regarding the religious controls, we observe that *desa* villages tend to have higher number of religious facilities per capita, although this is in part driven by the fact that they are more sparsely populated. Finally, *kelurahan* tend to have better communications, in terms of roads and number of TVs, and higher number of health and educational facilities per capita. Since all of these characteristics can be important determinants for vote behavior, I will control for all of them in the preferred econometric specification.

Some additional statistics are provided regarding the number of administrative subdivisions in the sample and the electoral results by district.

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[40]Further details were specified in the following regulation: Peraturan Menteri Dalam Negeri Nomor 5 Tahun 1982.

[41]The reason provided by the Ministry of Home Affairs for this change in policy was the financial burden of the formation of *kelurahan* on the central government: the members of the *kelurahan* government have the status of civil and had to be on the government payroll.

1.5 Empirical Strategy and Results

1.5.1 Econometric Specifications and Baseline Results

In this section, I discuss the econometric analysis of the differences in electoral results between comparable *desa* and *kelurahan*. First, I examine the result for the whole sample and in the next subsection I study the heterogenous effect across districts. In my analysis, I will employ two different econometric methods: ordinary least squares (OLS) and propensity score matching.

The OLS specification takes the following form:

$$y_v = \beta k_v + \delta_m + \mathbf{X}'_v \boldsymbol{\theta} + \varepsilon_v \tag{1.27}$$

where y_v is a dummy that takes value 1 if a particular party obtained the highest number of votes in village v in a given election, k_v is a dummy that takes value 1 if the village is a *kelurahan* (has an appointed village head) and 0 if it is a *desa*, δ_m are district fixed effects, and $\mathbf{X}'_v$ is a vector of control variables. The main coefficient of interest is β, since it corresponds to additional probability that a party has to win in a *kelurahan* relative to a *desa* within a district.

Table 2 shows the results of this regression when different sets of covariates are controlled for. The point estimate of the coefficient on the *kelurahan* dummy is approximately 0.05 and significant at the 1% confidence level. Moreover, it is robust to the inclusion of a broad set of controls, and once the geographic differences between *desa* and *kelurahan* are accounted for, the coefficient of interest does not change much when adding additional controls. This coefficient reflects that Golkar is 5 percentage points more likely to win in *kelurahan* than in *desa* and this effect is not driven by underlying differences on geographic, religious or facilities characteristics. The coefficients on some of the controls are also noteworthy. The number of mosques per thousand people is strongly correlated with vote for Golkar. Although Golkar is not an Islamic party, a number of policies implemented during the last years of the New Order to obtain higher support among Muslims might have had their returns in the 1999 election. In contrast, PDI-P has some sympathies among Christian groups, what could be behind the negative sign of the coefficient on the number of churches. The positive coefficients on the number of hospitals, polyclinics and *puskesmas* (primary care centers) are consistent with the possibility that voters rewarded the incumbent party (Golkar) for the provision of these public

goods during the Suharto period. The last column of Table 2 displays the results for the whole sample, that includes districts with fewer than 5 *desa* or 5 *kelurahan*. Since the results are broadly similar, in the rest of the paper I report the results on the restricted sample to ensure that my results are not driven by districts in which there is an insufficient amount of overlap.

Overall, Table 2 shows that support for Golkar was considerably higher in *kelurahan* villages than in *desa* villages. This is consistent with the implications of the model developed in Section 2, which predicts that in most regions patronage networks will be at work to support the dictator's party. In the next subsection I will describe how this result differs by subsample, depending on the expected electoral outcome at the district level.

The second method I use is propensity score matching, first introduced by Rosenbaum and Rubin (1983), which compares the differences in outcomes of treatment and control units with a similar probability of being treated. This method estimates the average treatment effect as long as the following two conditions hold

$$\text{(Unconfoundendness given the propensity score)} \quad (y_v = 0, y_v = 1) \perp k_v \mid p(X_v)$$

$$\text{(Overlap)} \quad 0 < \Pr(k_v = 1 | X_v) < 1$$

where $p(X_v)$ is the propensity score or the probability of receiving treatment (being a *kelurahan*) conditional on the covariates.[42]

The particular matching algorithm that I use is block propensity score matching. I employ this method in order to ensure that *desa* and *kelurahan* are matched within districts.[43] This method is implemented in three steps. First, the propensity score is estimated using a probit model in which the dependent variable is the *kelurahan* dummy. Second, I restrict the sample to those observations for which there is sufficient overlap of the estimated propensity score between the two comparison groups (*desa* and *kelurahan*). Third, I divide the observations into five subgroups depending on the percentile of the propensity score distribution in their district.[44]

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[42]Unconfoundedness given the propensity score is implied by the Conditional Independence Assumption ($y_v = 0, y_v = 1) \perp k_v \mid X_v$, as shown by Rosenbaum and Rubin (1983).

[43]Therefore, this method produces analogue results to the OLS regression, which includes district fixed effects.

[44]For instance, one of the dummies takes value 1 if the estimate of the propensity score for a village is lower than the 20th percentile of the propensity score distribution in its district. Another dummy takes value 1 if the village is between the 20th and the 40th percentiles of the propensity score distribution in its district. Etcetera.

Then, I interact the dummies for each of those groups with the full set of district fixed effects and regress my dependent variable on the *kelurahan* dummy and the full set of propensity score interval - district fixed effects interactions. Therefore, this method is estimating the differences in the conditional expectation of the dependent variable between *desa* and *kelurahan,* which are in the same district and in the same interval of the propensity score estimate.

The outcome of the first step is reported in Table 3A. As expected, all the covariates that measure the level of urbaness are positively correlated with the probability of being a kelurahan. The urban dummy and population density have positive and significant coefficients, whereas the percentage of households whose main occupation is in agriculture, the percentage of land in agriculture, and the distance to the sub-district office are negatively related to the probability of being a *kelurahan.*

Second, I restrict the sample to those observations for which there is enough overlap. The distribution of the estimated propensity score for *kelurahan* and *desa* can be seen in Figures 3A and 3B respectively.[45,46]

The results of the third stage are displayed in Table 3B. I report the estimates for two different sample restrictions and for the inclusion of three different sets of covariates in the first stage. This different approach leads to substantially similar results as the OLS results, reported in Table 2.[47]

Finally, notice that the high number of observations that are dropped in this analysis due to lack of common support highlights that the effect I am estimating is a local average treatment effect. Since the classification of villages into *desa* and *kelurahan* is related to the level of urbaness of the area, the main results come from the comparison of *kelurahan* to *desa* that are relatively similar in terms of their level of urbaness; either because some *desa* might be in the

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[45]Figure 3A displays the estimated propensity score for *kelurahan* villages and Figure 3B for *desa* villages. The propensity score estimate corresponds to the model of column (3) in Table 3A. Most of the *desa* villages have an estimate of the propenstity score close to 0, reflecting that they are quite rural. However, we observe that the probability of being classified as *kelurahan* substantially varies for the *kelurahan* group. Therefore, there are some *kelurahan* in the sample that are quite rural, which provides enough overlap to employ this empirical strategy.

[46]The graph of the estimated propensity score for *desa*, Figure 3B, is limited to those observations with propensity score higher to 0.01. This is done in order to see the Figure at a smaller scale. There are 22,953 *desa* with estimated propensity score lower than 0.01.

[47]The standard errors are bootstrapped to account for the additional sampling error introduced by having a regressor estimated from a first stage.

proximity of an urban area, and are therefore quite urban, or because some *kelurahan* were formed in a quite rural region.

1.5.2   Heterogenous Effects

The model developed in Section 2 leads to a number of different predictions regarding how the total effort exerted by appointed village heads differs depending on the expected electoral result. Given that the appointment rights of the *kelurahan* heads rested on the district level, Indonesia provides an ideal setting to explore whether the empirical results shown in Tables 2 and 3B depend on the district electoral outcome in the way the theory predicts, which was summarized by Figure 2.

In order to asses these predictions, I run the same regression on different subsamples. Although I do not have a direct measure of the expected result, I take the actual electoral result of the 1999 election as a proxy for its expectation. According to Thompson (1999) there were a number of polls prior to the election, that were quite accurate, what suggest that this approximation is a valid one. I divide the set of districts in four groups depending on whether Golkar or PDI-P won and whether the margin of victory was large or small. Notice that in the regressions displayed in Table 2, the district fixed effects already controlled for differences in the level of support for each party at the district level. By running the regressions in different subsamples, I explore whether the within district differences in the voting pattern of *kelurahan* and *desa*, changes across districts depending on what was the electoral result at the district level.

Table 4 shows the results by subsample which are broadly consistent with the empirical predictions of the model. As we can see from columns (2) to (5), the main effect of *kelurahans* voting more for Golkar than *desa* comes mostly from districts in which Golkar won. In columns (6) to (10) we conduct the same exercise but having as dependent variable a dummy for whether PDI-P won. Notice that this result is consistent with the "reversal effect" predicted by the theory: in regions in which PDI-P was expected to win by a large margin, appointed village heads exerted more effort to promote the electoral chances of PDI-P. The fact that this heterogenous effect, predicted by the theory, is also observed in the data is particularly noteworthy.

In order to further explore this heterogenous effect, I run a different regression per district

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and plot the coefficient on the *kelurahan* dummy against the district electoral outcome.[48] The result of this exercise is shown in Figure 4. Then, the displayed coefficients are connected by a non-parametric cubic spline regression. This figure highlights that there is a heterogenous pattern of the result across districts, which is consistent with the predictions of the theory (summarized by Figure 2).[49,50]

As discussed in the theory part of the paper, the interpretation of this pattern is given by the combination of changes in the proportion of village heads that are sympathizers of each party and changes in the optimal amount of individual effort. In districts in which Golkar lost by a large margin, the proportion of non-Golkar supporters was probably high. As we move to regions in which the election was expected to be more contested, non-Golkar supporters started increasing their level of effort towards PDI-P and Golkar supporters effort towards Golkar. However, the former effect dominated because of the higher proportion of non-Golkar supporters. Consequently, we observe a decrease in effort towards Golkar. When the proportion became more balanced, aggregate effort towards Golkar began to increase. Once we focus on districts where Golkar was expected to win by a large margin, Golkar supporters decreased their level of effort because the productivity of effort became lower. Given the higher proportion of Golkar supporters in those districts this effect dominated and we observe a decrease in effort towards Golkar.

1.6 Robustness Checks

In this section I examine a number of competing hypotheses that could also explain why on average Golkar obtained higher support in *kelurahan* than in *desa*. Although none of these competing hypotheses is able to provide a rationale of the heterogenous effects found in the previous section, it is still important to consider what other explanations could confound my results.

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[48]Each regression is estimated by nearest neighbor propensity score matching with replacement.

[49]The x axis of Figure 4 corresponds to the difference between the vote share of Golkar and the vote share of the 2nd most voted party, when Golkar won, and the vote share of the most voted party minus the vote share of Golkar, when Golkar was 2nd.

[50]Notice that the variable represented in the x axis of Figure 4 is a measure of how contested was the realized electoral result. Ideally, would plot the results as a function of the underlying relative support for Golkar in the population. However, in the absence of such measure I used the realized vote shares as a proxy.

1.6.1 Endogenous Selection of *Kelurahan*

The results presented could be invalid if there was reverse causation, i.e., if villages where Golkar had a higher underlying support within a district, were classified as *kelurahan*. This possibility is not particularly appealing since it would imply that villages with stronger opposition to Golkar were classified as *desa*, hence, had village head elections. In general, we might expect that dictators are reluctant to allow elections in areas where they have low support, in order to avoid the selection of leaders into office that might have views contrary to those of the dictator.

If the formation of *kelurahans* was encouraged within districts in areas of relative higher support for Golkar, we might expect that *kelurahan* formation was also encouraged in certain regions of the country. The urbaness requirement for being classified as *kelurahan* might have been lower in districts where Golkar had high underlying support. In that case, the estimated propensity score of *kelurahan*, conditional on the observable urbaness characteristics, should be lower in districts where Golkar obtained larger vote shares.[51] In order to test this hypothesis, I regress the average propensity score estimate of *kelurahans* at each district on the vote share that Golkar obtained in the 1971 and 1999 elections. The results are plotted in Figures 5a and 5b and the regression results are in Appendix Table 1. There is no statistically significant relation between these two variables for the 1971 election. There is a weak relation for the 1999 elections, but it is positive, contrary to what the endogenous selection hypothesis predicts.

Still, this approach does not rule out the possibility that *kelurahans* were formed in the areas with higher relative support for Golkar within a district. Unfortunately, I do not have a direct measure of support for Golkar at the village level previous to the first democratic election. However, I was able to control for some variables that might be correlated with political preferences or other unobservable variables that the Suharto's regime could have taken into account when conducting the village classification. Table 5 reports the results when adding controls for conflict,[52] military and police presence, and natural resources. Neither the significance nor the point estimates of the *kelurahan* coefficient change when controlling for this additional set

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[51] The propensity score is estimated using a probit model in which the dependent variable is a dummy that takes value 1 if the village is a *kelurahan* and has the main urbaness characteristics as controls. For this robustness check I use the estimate of the propensity score that corresponds to column 3 of Table 3A.

[52] The conflict variables were reported the 2003 wave of the PODES dataset and refer to the year 2002. However, there was a high degree of persistance of certain underlying conflicts, such as separatist movements. Therefore, those conflict measures are probably a good proxy for conflict in the previous years.

of controls. Hence, these results suggest that the classification of villages was not driven by political considerations.

1.6.2 Changes in Village Resources and Occupational Composition

My results would be confounded if there were other determinants of voting behavior, that are different between *desa* and *kelurahan*, but that are not related to the method of selection of the village head. For instance, we have seen that *kelurahan* had higher levels of health and educational facilities. If there was a process of expansion of public goods during the Suharto regime, particularly targeted at *kelurahan* villages, this could potentially explain the higher support of Suharto's party in those villages. In Table 6, I repeat my analysis adding controls for changes in the number of facilities, changes in transfers from upper levels of government and the allocation of poverty alleviation programs. The inclusion of these additional covariates does not affect the results.[53],[54]

Another possibility is that *kelurahan* and *desa* had a different occupational composition. Voting behavior in Indonesia is sometimes driven by sectorial considerations. Traditionally, Golkar was considered the party of the civil servants and the army. If there is a higher proportion of civil servants in *kelurahan* than in *desa*, this could affect my result. In Table 7, I show the results when controlling for the occupational composition of *desa* and *kelurahan*. The occupational composition data comes from the National Socioeconomic Household Survey (SUSENAS). Since I only have this information for a subset of villages, the sample size is considerably reduced. Still the baseline result in this subsample, for the *kelurahan* dummy, is positive and significant with a 0.039 coefficient. When controlling for the occupational composition in the village the coefficient changes slightly in magnitude, but it is still positive and significant.

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[53]The changes in transfers by upper levels of government correspond to the percentage change in funding between 1996 and 2003. No data on village funding was reported in 1999.

[54]IDT (Presidential Instruction on Left-Behind Village Development) program was a poverty alleviation program implemented between 1994 and 1996. Each village selected received 20 million Rupiahs (US$ 8700) to be used as a small-scale rotating credit fund for groups of poor people in the village, to be invested in self-employment activities.

1.6.3 Democratic Capital Hypothesis

The flip side of the main result in Table 2, is that villages with an elected village head are less likely to vote for Suharto's party. An alternative rationale might be the following: because these villages were able to hold village elections to select their leaders, their citizens could have developed a stronger democratic culture. Then, at the time of the 1999 election they were less inclined to vote for Golkar, which represented the autocratic status quo, and tended to vote more for reformist parties. However, village head elections took place every 8 years, a relative long period of time. These elections were highly controlled by the Suharto's regime: candidates were pre-screened by government officials and the election was non-partisan. Moreover, elections for the national, provincial and district legislatures took place every 5 years both in *desa* and *kelurahan*. Therefore, the differences in levels of democratic capital of *desa* and *kelurahan* might had been small.

In order to test this hypothesis I examine data from a household survey conducted in 2008 for the project "How to Target the Poor: Evidence from a Field Experiment in Indonesia" by Vivi Alatas, Abhijit Banerjee, Rema Hanna, Benjamin A. Olken, and Julia Tobias (2009). In this survey several questions were asked about trust, participation in elections, participation in different types of organizations, motivation of voting behavior, and perception of corruption. In Table 8, I explore what were the differences in the responses to these questions in *desa* and *kelurahan* villages. Notice that most of the differences become insignificant once I include the covariates of my preferred specification. Still, there are some significant differences: villagers in *kelurahan* are more likely to agree with the statement that most people can be trusted, which is not consistent with the democratic capital hypothesis. On the other hand, they are also less likely to vote based on the program of the candidate, but there are no differences in whether their vote was motivated by performance, religious or ethnic considerations. Interestingly, villagers of *kelurahan* are less likely to think there is low corruption in the village government, which is consistent with the mechanism highlighted in this paper.

Overall, this data does not provide support for the democratic capital hypothesis, since there are no significant differences in the most important measures of democratic attitudes: trust, participation in elections and in community organizations.

1.7 Dynamic Implications

The type of equilibrium that emerges in the first democratic election has very different implications regarding the composition of appointed village heads that will be in office at the onset of the second democratic election. If a separating equilibrium emerged during the first election, village head turnover was high: since political leanings were truthfully revealed along the equilibrium path, when the new mayor took office, she was able to detect her non-supporters and fire them. In contrast, in districts where the equilibrium was pooling, all appointed village heads exerted the same level of effort and consequently the composition of village heads remained unchanged. Therefore, the proportion of village heads that are supporters of a given party should be higher in districts where that party won by a tight margin in the first election, and lower if they won by a large margin (in the former case the equilibrium was separating, while in the latter case the equilibrium was pooling).

These predictions are summarized in Figure 6, in which we can see the proportion of village heads that are supporters of the dictator's party at the time of the first and second election (γ_1 and γ_2, respectively), when drawn as a function of the vote share of the dictator's party in the first election π_1. If the vote share was below the threshold $\underline{\pi}$ or above the threshold $\bar{\pi}$, a pooling equilibria emerged and consequently, the composition of village heads remained unchanged.[55] If the vote share was between those two thresholds, a separating equilibria emerged and each mayor dismissed all their non supporters.

Unfortunately, I do not have data on village heads turnover that would allow me to directly test for these theoretical predictions. However, I can use data on the electoral result of the second election to investigate whether the data is consistent with these implications of the model. Notice that elected village heads will still exert zero level of effort, since the continuity in their positions does not depend on the outcome of the second election either. In contrast, appointed village heads will still have incentives to continue to exert effort.

In districts where there was a separating equilibrium during the first election, the political leanings of appointed village heads were truthfully revealed along the equilibrium path. Even though they will no longer have the signaling motivation to exert effort, they will still have

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[55] For simplicity these thresholds are drawn in the axis of the realized vote share. The model predicts that this thresholds are defined in terms of the underlying support of each party.

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electoral incentives to exert effort in order to get the incumbent reelected. The reason being that they will be fired if the incumbent party loses the second election. Hence, each appointed village head will choose effort level e_i^* that maximizes their expected utility:

$$e_i^* = \arg\max_e \{p_2(E_{-i} + e)R - (1 - p_2(E_{-i} + e))\underline{U} - \underline{\alpha}C(|e|)\}$$

where $E_{-i} = \sum_{j \neq i} e_j^*$ is the aggregate effort that the rest of appointed village head exerts.

In districts in which there was pooling a equilibrium in the first election, the implications are less straightforward. Since their political leanings were not revealed during the first election, there might still be imperfect information about their political preferences. Strictly speaking, both pooling and separating equilibrium could emerge at the time of the second democratic election. If a separating equilibrium emerges in the second election, effort to support the incumbent party, should be much lower than in districts that had separating equilibrium in the first and second election: in the former case appointed officials that are non-supporters of the incumbent party are still in office, while in the latter case they were all dismissed. If instead a pooling equilibrium emerges in the second election, the empirical prediction is ambiguous. However, it is possible that during the length of the first democratic term, some village heads had their types revealed and will therefore, exert effort to support their most preferred candidate in the second election. If this is the case, we would also expect effort to support the incumbent being lower when compared to districts that had separating equilibrium in the first and second election.

Notice that this leads to somewhat counterintuitive predictions for the second election: we expect effort of appointed village heads to support the incumbent party to be higher in districts in which the incumbent won by a tight margin in the previous election, than in districts where they won by a large margin. I use data from the second democratic election of 2004 to provide some suggestive evidence of these mechanisms. Table 9 displays the results. For columns (1) to (5) the dependent variable takes value 1 if Golkar was the most voted party in the village in the 2004 election. The highest support of appointed village heads for Golkar comes from districts in which Golkar won by a small margin in 1999 (column (4)): Golkar was 12 percentage points more likely to win in *kelurahan* than in *desa* in those districts. This effect is definitely larger

than in districts where Golkar won by a large margin (column (5)). In regions where PDI-P won in the first election, appointed village heads support more Golkar if PDI-P won by a large margin (column (2)) than if the margin of victory was small (column (3)).

In Appendix Table 2, I conduct the same analysis but conditioning as well on the result of the 2004 election.[56] Some of these results are noteworthy. Conditional on Golkar winning by a small margin in 2004 (row (C)), among districts in which PDI-P won the first election, appointed village heads only support Golkar if PDI-P won by a large margin. When the margin of victory was small, we observe a negative coefficient (although no statistically significant). These results are consistent with the highlighted mechanism: when the margin of victory was large, a pooling equilibrium emerged in the first election, which prevented the new PDI-P mayor to detect her non-supporters. At the time of the second election, when the election was expected to be more contested, those village heads that were Golkar supporters exerted a considerable effort to try to make Golkar win the district. This effect is absent for the latter district, consistent with the hypothesis that Golkar supporters were identified and dismissed after the first election.

However, some of these results remain unexplained by my theory. First, we observe a significant amount of persistence of the effect that appointed village heads are more likely to support Golkar than elected village heads. This could, in part, be driven by the sectorial considerations highlighted above. Golkar is perceived as the party of the bureaucracy and, by the time of the second election, the party had undertaken substantial internal reforms that diminished the perception that it represented the autocratic tendencies of the Suharto's regime. The combination of these factors might have encouraged appointed village heads to continue to support Golkar. Second, in districts in which PDI-P won by a small margin, the theory would predict a negative coefficient: if all appointed village heads that were Golkar sympathizers would have been dismissed and replaced by others, we should expect higher support for PDI-P in those districts. Still, on average the coefficient is positive, although not as statistically significant, what reflects there was a higher dispersion on support for Golkar. It is possible that there were difficulties to the dismissal or transfer of a significant number of appointed village

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[56] The results are displayed in a matrix form in which each cell displays the *kelurahan* coefficient of the baseline regression when run in a subsample defined by the corresponding column and row.

heads, what could provide a rationale for the persistence of this effect in these regions.

Overall, although the results from the second election are not a conclusive proof of the theory presented, the non-monotonicity of the result, to a great extent consistent with the theory, is highly suggestive.

1.8 Conclusions

In the event of a regime change, appointed officials, far from being neutral agents, have a vested interest in the development of the new political situation. Since they are appointed by upper levels of government, the continuity in their positions depends on who wins the election and on whether the winner decides to renew their appointment or to fire them. In contrast, elected officials will lack this additional incentive because their jobs do not depend on changes at upper levels of government: they were elected into office through local level elections and will remain in office until local elections are held again.

How do these career concerns shape the incentives that appointed local officials face at the onset of the first democratic election? Contrary to institutions and policies developed during the nondemocratic regime, which persist and it takes time to reform, the loyalty ties that appointed officials had with the previous regime, can suddenly change in response to the new political scenario. This paper develops a model to better understand the nature of the incentives that local officials face, how they optimally respond to them and what consequences this has for the outcome of the first democratic election. It also incorporates two specific features of regimes in transition. First, political leanings of local officials are assumed to be private information. The repressive nature of nondemocratic regimes, usually endows new democracies with a high degree of uncertainty about who supports whom, especially within the government administration. Second, the existence of mechanisms for voter co-optation. Most nondemocratic regimes rely extensively on the use of patronage networks and other cooptation mechanisms to obtain support, or simply compliance, from the population. These networks, usually rooted at the local level, are likely to still be in place at the onset of the first democratic election. However, with no longer a strong central power to hold local officials accountable, the question then becomes: what political force will local officials support when operating these patronage

networks?

The model highlights that in most scenarios appointed local officials will use these networks to promote the electoral chances of the previous dictator's party. If the dictator's party is expected to win by a large margin a pooling equilibrium emerges, in which all appointed officials exert effort to support that party. If the election is expected to be contested, a separating equilibrium emerges, in which each appointed official supports their most preferred candidate. However, even in the latter case, the likely higher proportion of dictator's supporters among government ranks would generate a net effect that favors the dictator's party. Therefore, only if the reformist party is expected to win by a large margin, this effect is reversed: a pooling equilibrium emerges in which appointed local officials exert costly effort to support the reformist party and pretend to be their strongest supporters, in an ultimate attempt to keep their jobs.

I provide empirical evidence from the first democratic election of Indonesia post-Suharto, that corroborates these patterns. On average, Suharto's party was 5 percentage points more likely to win in villages that had an appointed village head, relative to those that had an elected village head. Consistent with the implications of the model, this result is reversed for districts in which the main reformist party won by a large margin. In those districts, the reformist party is 4 percentage points more likely to win in villages with an appointed village heads relative to those with an elected village head. The results are robust to the inclusion of a broad set of controls, district fixed effects, and similar across econometric methods (ordinary least squares and propensity score matching).

I also provide some suggestive evidence regarding the dynamic implications of the different equilibria that emerges on the first election, on the electoral outcome of the second election. In particular, I find that in the second election, Golkar obtained more votes from villages with an appointed village head, in those districts where Golkar previously won by a tight margin, rather than in districts where they won by a large margin. One possible interpretation of this result is that in districts where Golkar won by a tight margin, a separating equilibrium emerged, and the new mayor was able to identify and dismiss all non-Golkar supporters. This was not possible in districts where Golkar won by a large margin, because a pooling equilibrium emerged and political leanings were not revealed along the equilibrium path. A similar pattern is observed in districts where PDI-P won by a large versus small margin in the first election. The model

presented in this paper provides a rationale for this, otherwise counterintuitive, result.

These results might be susceptible to omitted variable bias or reverse causation problems. For robustness, I check for a variety of possible confounding effects. First, I show that there is no evidence that the classification of villages was driven by political considerations. In particular, the urbaness requirements for being classified as *kelurahan* (villages that had an appointed village head) are not lower in districts where Golkar has historically obtained higher support. In order to further explore the possibility of endogenous classification of villages within districts, I add additional covariates that could be correlated with underlying opposition to the regime at the village level, such as, presence of the military and police, or conflict between villagers and the government apparatus. The results are unaffected when incorporating this additional set of controls. Second, my results do not change when including other covariates that could affect voting behavior, such as changes in the level of public goods, changes in government funding, a dummy for whether the village was the recipient of a poverty relieve program, and the occupational composition of the village. Finally, I explore the validity of an alternative hypothesis: villages that were able to elect their village head might have developed a stronger democratic culture. Then, at the time of the first democratic election, they were less likely to vote for Suharto's party. I test this hypothesis with survey data on democratic attitudes. Most villagers' answers are not statistically different between these two types of villages. This holds for measures of trust, participation in elections or community organizations. Interestingly, people living in villages that had an appointed village head are more likely to think that there is corruption in the village government, which is consistent with the mechanisms highlighted in this paper.

Overall, this paper finds substantial evidence that, unless reformist parties are expected to win by a large margin in the first democratic election, appointed officials will promote the electoral chances of the dictator's party. What are the implications of this finding for the process of democratic consolidation? The answer is not clear. On the one hand, a victory of the heirs of the dictator's party could legitimate the previous autocratic regime. The elected government could refuse to implement democratic deepening reforms, what could lead to an unconsolidated or captured democracy. On the other hand, the victory of the dictator's party could prevent some extremist group from winning the election. If the victory of this extremist

group would have lead to a military coup d'état, preventing this from happening might be positive for the process of democratic consolidation. Providing an answer for these questions is beyond the scope of this paper and will be a venue for future research. Instead, this paper contributes to the development of a better understanding about how one of the legacies of the previous regime can bias the electoral outcome of the first democratic election; which under certain circumstances might endanger the process of democratic consolidation.

Finally, this paper provides some lessons that could be useful for policy considerations. Mainly, this paper highlights that appointed local officials have stronger incentives to influence voters during upper level elections. This could bias the electoral results and promote the persistence of corruption practices, especially for regimes in transition. These factors should be taken into account when exploring the trade off of either method of selection for local officials.

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1.9 Appendix

1.9.1 Proof of Proposition 2

First, notice that from our discussion in subsection 2.2.2 on the mayor optimization problem, it is evident that the mayors' strategies formulated in this equilibrium are best responses given the specified beliefs. Second, provided that condition (1.18) holds, type b will not have incentives to deviate. Third, it is straightforward to see that if type b does not have a profitable deviation, neither does type a, since the only difference in their optimization problems is the higher costs for type a of deviating to negative levels of effort.

The second part of the proposition states that the pooling PBE in which all village heads exert effort level e_a^* satisfies the Intuitive Criterion. In order to provide a more formal definition of the Intuitive criterion I introduce some additional notation. Let Θ be the set of the types of village heads, i.e. $\Theta = \{a, b\}$, and T a subset of Θ. Let $BR_A(T, e)$ be the set of pure strategy best responses of candidate for mayor A given beliefs $\mu(.|e)$ such that $\mu(T|e) = 1$, i.e. $BR_A(T, e) = \underset{\mu:\mu(T|e)=1}{\cup} BR_A(\mu|e)$ where $BR_A(\mu|e) = \arg\max_{\phi} \Sigma_t \mu(t|e) V_A^{app}(\phi, t)$. $BR_B(T, e)$ is defined similarly. $E_{-i} = \sum_{j \neq i} e_j$ is the sum of efforts that village heads other than i will exert in equilibrium.

Definition 2. The Intuitive Criterion. Fix a vector of equilibrium payoffs $U^*(.)$ for the village heads. For each strategy e, let $J(e)$ be the set of all types t such that

$$U^*(t) > \max_{\substack{\phi_A \in BR_A(\Theta, e) \\ \phi_B \in BR_B(\Theta, e)}} \left\{ p(E_{-i} + e) U_t^{app}(e, \phi_A) + (1 - p(E_{-i} + e)) U_t^{app}(e, \phi_B) \right\} \qquad (1.28)$$

If for some e there exists $t' \in \Theta$ such that

$$U^*(t') < \min_{\substack{\phi_A \in BR_A(\Theta \backslash J(e), e) \\ \phi^B \in BR_B(\Theta \backslash J(e), e)}} \left\{ p(E_{-i} + e) U_{t'}^{app}(e, \phi_A) + (1 - p(E_{-i} + e)) U_{t'}^{app}(e, \phi_B) \right\} \qquad (1.29)$$

then the equilibrium fails the Intuitive Criterion.[57]

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[57] $U_t^{app}(e, \phi)$ is defined by (1.5) if $t = a$ and by (1.6) if $t = b$.

In order to show that the pooling PBE in which effort level is e_a^* satisfies the Intuitive Criterion, let me first proof the following claim.

Claim 1. Consider the equilibrium stated in Proposition 2 with associated effort level e_a^*. If $\frac{G-c}{G} < \frac{1}{2}$, for any deviation $e \neq e_a^*$ inequality (1.28) is satisfied for type a, i.e., $\{a\} \subseteq J(e)$.

Proof. The equilibrium payoffs of type a are given by the expression below

$$U^*(t = a) = p(ne_a^*)(R - \underline{U}) + \underline{U} - \underline{\alpha}C(e_a^*)$$

Consider the possible out of equilibrium beliefs that could be formed and the deviation payoffs that type a would obtain upon deviation:

i. $\mu(t = a | e \neq e_a^*) = 1$. In this case, mayors' best responses to deviations from the equilibrium will be $\phi_A^*(e) = 1$ and $\phi_B^*(e) = 0$ for $e \neq e_a^*$. The deviation payoffs for type a would be $U(e|t = a) = p((n\text{-}1)e_a^*+e)(R\text{-}\underline{U}) + \underline{U} - \underline{\alpha}C(e)$.[58] Hence, the optimal deviation would be implicitly defined by the expression below

$$\psi(R - \underline{U})\left.\frac{\partial g(E)}{\partial E}\right|_{E=(n-1)e_a^*+e} = \underline{\alpha}C'(e)$$

If we take the limit of e when it tends to e_a^*, we find that the above expression is equal to equation (1.19), in which e_a^* was implicitly defined. In other words, e_a^* is defined such that the optimal "deviation" of type a, when every other village head is exerting effort e_a^*, would be exactly to the level e_a^*. Consequently, when out of equilibrium beliefs are $\mu(t = a | e \neq e_a^*) = 1$, the deviation payoffs will always be lower than the equilibrium payoffs.

ii. $\mu(t = a | e \neq e_a^*) = 0$. In this case, the best responses of mayors are $\phi_A^*(e) = 0$ and $\phi_B^*(e) = 1$ for $e \neq e_a^*$. The expected payoffs that village head type a obtains upon deviation are $U(e|t = a) = [1 - p((n\text{-}1)e_a^*+e)](R\text{-}\underline{U}) + \underline{U} - \overline{\alpha}C(|e|)$.[59] However, since

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[58] Deviating to negative values of effort would be dominated by deviations to $e \geq 0$. Therefore, I do not discuss those deviations.

[59] Similarly as in case i, we only consider deviations to $e \leq 0$, because deviations to positive levels of effort are dominated by $e = 0$.

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expression (1.17) holds, we know that the equilibrium payoffs are higher than deviation for type b, and so will be for type a.

iii. $\mu(t = a|e \neq e_a^*) = \kappa \in (0,1)$. Depending on how κ relates to $\frac{G-c}{G}$ there are different best responses mayors can take.

    iii.a. $\kappa > \frac{G-c}{G} > 1 - \kappa$. In this case best responses to a deviation are $\phi_A^*(e) = 1$ and $\phi_B^*(e) = 0$ if $e \neq e_a^*$. The same discussion as in case i. above applies.

    iii.b. $1 - \kappa > \frac{G-c}{G} > \kappa$. Mayor's best responses are $\phi_A^*(e) = 0$ and $\phi_B^*(e) = 1$ if $e \neq e_a^*$. And the same discussion as in case ii. follows.

    iii.c. $\frac{G-c}{G} > \kappa$ and $\frac{G-c}{G} > 1 - \kappa$. Mayor's best responses are $\phi_A^*(e) = 0$ and $\phi_B^*(e) = 0$ if $e \neq e_a^*$. Village head type a deviation payoff will be $U(e|t = a) = \underline{U}$, which is lower than equilibrium payoff.

    iii.d. $\kappa > \frac{G-c}{G}$ and $1 - \kappa > \frac{G-c}{G}$. This case it is ruled out because in this claim we restrict ourselves to the parameter set in which $\frac{G-c}{G} < \frac{1}{2}$. I discuss the case in which $\frac{G-c}{G} > \frac{1}{2}$ at the end of this proposition.

Therefore, as long as $\frac{G-c}{G} < \frac{1}{2}$, for any possible out of equilibrium beliefs a deviation to $e \neq e_a^*$ would not be profitable for type a.■

Next, I check the second part of the Intuitive Criterion. Let us focus on deviations in which type a is the only element of set $J(e)$ $J(e) = \{a\}$ and, hence, $\Theta \backslash J(e) = \{b\}$.[60] The only out of equilibrium beliefs that could be formed, when restricted to the set of types $\Theta \backslash J(e)$ are $\mu(t = a|e \neq e_a^*) = 0$. This leads to best responses of mayors $\phi_A^*(e) = 0$ and $\phi_B^*(e) = 1$ if $e \neq e_a^*$. In this scenario type b deviation payoff will be $U(e|t = b) = [1 - p((n\text{-}1)e_a^* + e)] (R\text{-}\underline{U}) + \underline{U} - \underline{\alpha}C(|e|)$. Notice that inequality (1.17) guarantees that equilibrium payoffs are higher than these deviation payoffs, thus, ruling out that type b has a profitable deviation to e. Therefore, we can conclude that, for $\frac{G-c}{G} < \frac{1}{2}$, the Intuitive Criterion is satisfied.

Finally, let us consider the case in which $\frac{G-c}{G} \geq \frac{1}{2}$. In this case, the following out of equilibrium beliefs could be formed $\mu(t = a|e \neq e_a^*) = \kappa$ where $\kappa > \frac{G-c}{G}$ and $1 - \kappa > \frac{G-c}{G}$. The

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[60]If $J(e) = \{a,b\}$, then $\Theta \backslash J(e) = \{\varnothing\}$ and therefore the second part of the Intuitive Criterion does not apply.

best response for mayor's upon deviation would be $\phi_A^*(e) = 1$ and $\phi_B^*(e) = 1$ if $e \neq e_a^*$. Therefore both types would like to deviate from the equilibrium, consequently $J(e) = \{\varnothing\}\ \forall e \neq e_a^*$. Verifying that the second part of the Intuitive Criterion does not hold is straightforward. Since we are examining a PBE, equilibrium payoffs will be higher than any deviation for a particular set of beliefs. Hence, they will be higher than the lowest deviation payoff for an arbitrary set of beliefs that could be formed over the whole set of types Θ. Therefore, we conclude that the equilibrium analyzed does not fail the Intuitive Criterion.■

Figure 7 provides the main intuition for why this pooling PBE satisfies the Intuitive Criterion. As we can see, type a obtains a higher payoff in equilibrium than what he would achieve undertaking any possible deviation, for either out of equilibrium beliefs $\mu(t = a | e \neq e_a^*) = 0$ or $\mu(t = a | e \neq e_a^*) = 1$. On the contrary, type b could conceivably increase his payoffs by deviating to $e_a^* - \varepsilon$, for $\varepsilon > 0$ and small, conditional on out of equilibrium beliefs being $\mu(t = a | e \neq e_a^*) = 1$. However, since type a would never have deviated to $e_a^* - \varepsilon$, mayors would deduce the deviator is type b. Hence, the relevant deviation payoffs would be those on the left hand side of the graph, in which out of equilibrium beliefs are $\mu(t = a | e \neq e_a^*) = 0$ and, consequently, deviation $e_a^* - \varepsilon$ would not be profitable for type b.

Finally, notice that in Proposition 2 we have only discussed PBE in which non negative levels of effort are exerted in equilibrium. There might be other pooling PBE in which village heads coordinate to negative levels of effort. However, this peculiar equilibrium in which both types exert effort to favor mayor B but mayor B always fires them, is sustained by unreasonable out of equilibrium beliefs. Consequently these pooling PBE will fail the Intuitive Criterion and I do not discuss them in the paper.

1.9.2 Pooling Equilibria for Other Parameter Sets

In Section 2, the set pooling PBE was derived for in which type a village heads are the majority, i.e. $\gamma > \frac{G-c}{G} > 1 - \gamma$. In this subsection I discuss other parameter sets. Let us first consider the opposite case to the one described in Section 2, in which type b village heads are the large majority.

CASE 2.

$$1 - \gamma > \frac{G - c}{G} > \gamma$$

This case is entirely symmetric to the case described in Section 2, since none of the assumptions made are specific to party A or B. Consider the following set of strategies and beliefs where $\widehat{e} \leq 0$

$$
\begin{aligned}
\phi_A^*(e) &= \begin{cases} 0 \text{ if } e = \widehat{e} \\ 1 \text{ if } e \neq \widehat{e} \end{cases} \\
\phi_B^*(e) &= \begin{cases} 1 \text{ if } e = \widehat{e} \\ 0 \text{ if } e \neq \widehat{e} \end{cases} \\
e_i^*(t) &= \widehat{e} \text{ for } t \in \{a, b\} \\
\mu(t = a | e = \widehat{e}) &= \gamma \\
\mu(t = a | e \neq \widehat{e}) &= 0
\end{aligned}
\tag{1.30}
$$

The strategies and beliefs stated above constitute a pooling PBE of this game as long as the following inequality holds

$$
\pi \leq \frac{1}{2\psi(R\text{-}\underline{U})} \left[\psi(R\text{-}\underline{U}) \left(1 - g(n\widehat{e}) - g((n\text{-}1)\widehat{e} + e_a^{*\prime}) \right) + \underline{\alpha} C(e_a^{*\prime}) - \overline{\alpha} C(|\widehat{e}|) \right]
\tag{1.31}
$$

where $e_a^{*\prime}$ is given by

$$
e_a^{*\prime} = \arg\max_{e \geq 0} \left\{ p((n\text{-}1)\widehat{e}) + e)(R - \underline{U}) - \underline{\alpha} C(e) \right\}
\tag{1.32}
$$

The following proposition summarizes the results and given that the proof is analogous to that of Proposition 2 I omit it from the text.

Proposition 5. *If condition $1 - \gamma > \frac{G-c}{G} > \gamma$ is satisfied, for each $\widehat{e} \leq 0$ such that inequality (1.31) holds, the set of strategies and beliefs specified in (1.30) constitutes a Pooling Perfect Bayesian Equilibrium of this game in which all appointed village heads exert effort $\widehat{e}$ and, along the equilibrium path, both keep their positions if candidate for mayor B wins and are dismissed otherwise. The PBE associated to the level effort e_b^* implicitly defined by the negative root of*

$$
\frac{\partial g(ne_b^*)}{\partial E} \psi(R - \underline{U}) = \underline{\alpha} C'(|e_b^*|)
\tag{1.33}
$$

satisfies *the Intuitive Criterion.*

Proof. Omitted.

Let us now examine a different set of parameters

CASE 3.

$$\gamma > \frac{G-c}{G} \text{ and } 1 - \gamma > \frac{G-c}{G} \tag{1.34}$$

In this case, both mayors A and B find optimal to retain all the appointed village heads along the equilibrium path. This corresponds to situations in which the cost of firing village heads, c, is very high, or when mayors' preference for village heads ideologically aligned to them, G, is very low. Consider the following strategies and beliefs as a candidate for a PBE of this game.

$$
\begin{aligned}
\phi_A^*(e) &= \begin{cases} 1 \text{ if } e \geq \widehat{e} \\ 0 \text{ if } e < \widehat{e} \end{cases} \\[2mm]
\phi_B^*(e) &= \begin{cases} 1 \text{ if } e \leq \widehat{e} \\ 0 \text{ if } e > \widehat{e} \end{cases} \\[2mm]
e_i^*(t) &= \widehat{e} \text{ for } t \in \{a,b\} \\[2mm]
\mu(t = a | e) &= \begin{cases} \gamma \text{ if } e = \widehat{e} \\ 1 \text{ if } e > \widehat{e} \\ 0 \text{ if } e < \widehat{e} \end{cases}
\end{aligned}
\tag{1.35}
$$

Notice that, in this equilibrium no village head will be dismissed along the equilibrium path, regardless of which mayor wins the election. Therefore, it is straightforward to see that if $\widehat{e} = 0$, the set of strategies and beliefs described above constitutes a PBE that will also satisfy the Intuitive Criterion. Since village heads are obtaining in equilibrium their highest feasible payoff, they will not have incentives to deviate for any out of equilibrium beliefs.

Let us now derive the necessary conditions for a level of effort $\widehat{e} > 0$ to be a PBE of this game. Village head type b will not have incentives to deviate as long as the following holds:

$$R - \overline{\alpha}C'(\widehat{e}) \geq (1 - p((n\text{-}1)\widehat{e} + e_b'))(R - \underline{U}) + \underline{U} - \underline{\alpha}C(|e_b'|)$$

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$$\pi \geq \frac{\psi\text{-}1}{2\psi} - g((n\text{-}1)\widehat{e}+e_b') + \frac{1}{\psi(R\text{-}\underline{U})} \left[\overline{\alpha}C(\widehat{e}) - \underline{\alpha}C(|e_b'|)\right] \tag{1.36}$$

where e_b' is type's b most profitable deviation, which is defined by (1.16). Notice that we also need to find the condition that guarantees type a village head does not want to deviate to an effort levels higher than the equilibrium one. By doing so, mayor B would dismiss him, but mayor A would still hire him. Village head type a will not have incentives to deviate as long as:

$$\pi \leq \frac{\psi+1}{2\psi} - g((n\text{-}1)\widehat{e}+e_a^{*\prime}) + \frac{\alpha}{\psi(R\text{-}\underline{U})} \left[C(e_a^{*\prime}) - C(\widehat{e})\right] \tag{1.37}$$

where $e_a^{*\prime}$ is type's a most profitable deviation, defined by (1.32).

Similarly, if $\widehat{e} < 0$, the no deviation constraint for type a is:

$$\pi \leq \frac{\psi+1}{2\psi} - g((n\text{-}1)\widehat{e}+e_a^{*\prime}) + \frac{1}{\psi(R\text{-}\underline{U})} \left[\underline{\alpha}C(e_a^{*\prime}) - \overline{\alpha}C(|\widehat{e}|)\right] \tag{1.38}$$

where $e_a^{*\prime}$ is type's a most profitable deviation that is defined by (1.32). Finally, type b will not have incentives to deviate to an effort level lower than $\widehat{e}$ if:

$$\pi \geq \frac{\psi\text{-}1}{2\psi} - g((n\text{-}1)\widehat{e}+e_b') + \frac{\alpha}{\psi(R\text{-}\underline{U})} \left[\underline{\alpha}C(|\widehat{e}|) - C(|e_b'|)\right] \tag{1.39}$$

The following proposition summarizes these results.

Proposition 6. *If conditions $\gamma > \frac{G-c}{G}$ and $1-\gamma > \frac{G-c}{G}$ are satisfied, for each $\widehat{e} > 0$ such that inequalities (1.36) and (1.37) hold and for each $\widehat{e} < 0$ such that inequalities (1.38) and (1.39) hold, the set of strategies and beliefs specified in (1.35) constitute a Perfect Bayesian Equilibrium of this game, in which all appointed village heads exert effort $\widehat{e}$ and, along the equilibrium path, both keep their positions if either candidate for mayor A or B wins the election. Finally, if $\widehat{e} = 0$ the set of strategies and beliefs specified in (1.35) are also a PBE. The PBE in which the associated levels of effort are either $\widehat{e} = 0$, $\widehat{e} = e_a^*$ or $\widehat{e} = e_b^*$, where e_a^* is implicitly defined by equation (1.19) and e_b^* is implicitly defined by the negative root of equation (1.33), do satisfy the Intuitive Criterion.*

Proof. Given the beliefs specified in *(1.35)*, it is straightforward to see that mayors' strategies are best responses to the different possible effort levels. For equilibrium effort levels $\widehat{e} > 0$,

condition (*1.36*) ensures that type b does not want to deviate. If type b does not have a profitable deviation, type a will not have incentives to deviate to effort levels lower than the equilibrium level of effort: type a has strictly lower deviation payoffs than type b for that range of potential deviations. Still type a might want to deviate to $e' > \hat{e}$. Condition (1.37) guarantees that this is not the case. A similar reasoning applies for equilibrium effort levels $\hat{e} < 0$. Regarding the PBE associated to a zero level of effort, $\hat{e} = 0$, it is obvious that no village head will want to deviate, and mayor's strategies are best responses given the beliefs specified. Finally, it remains to proof that PBE with associated levels of effort $\hat{e} = 0$, $\hat{e} = e_a^*$ or $\hat{e} = e_b^*$ do satisfy the Intuitive Criterion. The proof is very similar to the one described in Proposition 2 and it is left to the reader.∎

To sum up, when the costs of dismissing an appointed village head are high or when the additional utility that mayors obtain from ideologically aligned village heads are low, several pooling PBE that satisfy the Intuitive Criterion. The crucial parameter that help selecting among these multiple equilibria would be π, i.e., the proportion of citizens with leanings towards party A. However, we could not rule out that village heads coordinate to effort level $\hat{e} = 0$, since this would maximize their payoff.

The remaining set of parameters that we need to examine is the following.

CASE 4.

$$\frac{G-c}{G} > \gamma \text{ and } \frac{G-c}{G} > 1 - \gamma \tag{1.40}$$

For this set of parameters, in any pooling PBE the best responses of mayors will entail dismissing all appointed village heads. Therefore, levels of effort different than zero will not be sustained as pooling PBE since there will always be a profitable deviation to zero effort. At $\hat{e} = 0$ there can be a pooling PBE, but it will not satisfy the Intuitive Criterion, since it will always be feasible for one to the types to deviate to some level of effort that the other type would have not deviated, consequently breaking the pooling equilibrium. Overall, for this particular set of parameters, the most likely equilibrium will be a separating equilibrium. In the sake of brevity I do not discuss this case further.

1.9.3 Proof of Proposition 3

First, notice that given the beliefs specified in (1.20), it is straightforward to see that mayor's strategies are best responses to village heads actions. Second, if condition (1.23) holds, type a village head does not have a profitable deviation to negative levels of effort. Similarly, if condition (1.25) is satisfied, village head type b does not have a profitable deviation to positive levels of effort. Third, by construction, village head type a (b) does not have a profitable deviation to positive (negative) levels of effort. To see this, let us denote by e_a^* (e_b^*) the level of effort that village heads type a (type b) exert in equilibrium. The deviation payoffs for type a to an alternative positive level of effort are $U(e \neq e_a^* | t = a, e \geq 0) = p((n_a\text{-}1)e_a^* + n_b e_b^* + e)(R - \underline{U}) + \underline{U} - \underline{\alpha}C(e)$. At an interior solution, the optimal deviation denoted by e_a' would be implicitly defined by

$$\psi(R - \underline{U}) \left. \frac{\partial g(E)}{\partial E} \right|_{E=(n_a-1)e_a^* + n_b e_b^* + e_a'} = \underline{\alpha}C'(e_a') \tag{1.41}$$

Similarly, the optimal deviation of village head type b to a negative level of effort, e_b', is defined by the negative root of

$$\psi(R - \underline{U}) \left. \frac{\partial g(E)}{\partial E} \right|_{E=n_a e_a^* + (n_b-1)e_b^* + e_b'} = \underline{\alpha}C'(|e_b'|) \tag{1.42}$$

In order for village heads not to have a profitable deviation the following has to hold $e_a' = e_a^*$ and $e_b' = e_b^*$. Combining these two expressions with equations (1.41) and (1.42), we obtain $e_a^* = e^{*s}$ and $e_b^* = -e^{*s}$, where e^{*s} is implicitly defined by equation (1.21).

Finally, it remains to be proven that this equilibrium satisfies the Intuitive Criterion. The proof is very similar than the one of Proposition 2, so I only provide the main intuition here. If $\frac{G-c}{G} < \frac{1}{2}$, for any out of equilibrium beliefs that lead to mayors taking actions $\phi_A^*(e') = 0$ and $\phi_B^*(e') = 1$ or $\phi_A^*(e') = 1$ and $\phi_B^*(e') = 0$, neither village head find the deviation profitable. To see why notice that for type a, deviating to negative levels of effort would prompt actions $\phi_A^*(e') = 0$ and $\phi_B^*(e') = 1$ and deviating to positive levels of effort would lead to $\phi_A^*(e') = 1$ and $\phi_B^*(e') = 0$. The conditions that ensure this is a PBE also guarantee that any of the resulting deviation payoffs is lower than the equilibrium payoff. For out of equilibrium beliefs that lead to mayors' actions $\phi_A^*(e') = 0$ and $\phi_B^*(e') = 0$, the deviation payoff would be lower than the

equilibrium payoff. Since $\frac{G-c}{G} < \frac{1}{2}$, out of equilibrium beliefs that lead to both mayors retaining a deviator are not feasible. The same reasoning applies for village head type b. Hence, for any deviation e the set $J(e)$ as defined by the first part of the Intuitive Criterion,[61] contains both types a and b. Consequently, the second part of the Intuitive Criterion does not apply.

If $\frac{G-c}{G} < \frac{1}{2}$, the following out of equilibrium beliefs could be sustained $\mu(t = a||e'| \neq e^{*s}) = \kappa$ where $\kappa > \frac{G-c}{G}$ and $1 - \kappa > \frac{G-c}{G}$. In this case, a deviation would lead to actions $\phi_A^*(e') = 1$ and $\phi_B^*(e') = 1$ that will certainly lead to payoffs higher than the equilibrium ones. Then, the set $J(e)$ will be the whole set of types $J(e) = \{\Theta\}$ and, in the same way as Proposition 2, the second part of the Intuitive Criterion would not hold for any type. Consequently, we can conclude that the separating equilibrium described by Proposition 3, satisfies the Intuitive Criterion.■

1.9.4 Discussion of Result 1

Result 1 introduces two additional assumptions. The first assumption states that function $g(.)$ also depends on π and it can be expressed as the product of total effort and a function of π, i.e., $g(E, \pi) = E \cdot h(\pi)$ where $h(.)$ satisfies $h'(.) > 0$ if $\pi < \frac{1}{2}$ and $h'(.) < 0$ if $\pi > \frac{1}{2}$. The second assumption states that the proportion of types is positively correlated to π, i.e., $\gamma(\pi)$ satisfies $\gamma'(.) > 0$ and $\gamma(\pi) > \pi$ $\forall \pi$. I now proceed revise my analysis on the thresholds of pooling and separating equilibria when these new conditions are introduced.

Threshold Pooling Equilibria.

Proposition 2 states that as long as inequality (1.17) is satisfied, the set of strategies and believes specified in (1.15) constitute a PBE. Notice that under the above additional assumption on function $g(.,.)$ the optimal deviation level of effort can be expressed as the negative of the equilibrium effort, i.e. $e_b(\pi) = -e^*(\pi)$. Then, inequality (1.17) can be rewritten in the following way

$$2\pi \geq 1 - 2(n-1)e^*(\pi)h(\pi) + \left(\frac{\overline{\alpha}\text{-}\underline{\alpha}}{\rho}\right)C(e^*(\pi)) \tag{1.43}$$

Notice that we no longer obtain closed form solutions for the threshold of π defined when inequality (1.43) holds with equality. However as long as function $h(\pi)$ is not too sensitive to

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[61] See the proof of Proposition 2 in this Appendix.

changes in π the threshold of π will be well defined. Let us assume the standard quadratic cost function $C(e) = e^2$ that will allow us to obtain simple conditions on the function $h(\pi)$. Given this cost function, the equilibrium level of effort takes the following form $e^*(\pi) = \frac{\psi[R-U]}{2\alpha}h(\pi)$. Then, inequality (1.43) becomes

$$H_p(\pi) \equiv 2\pi - 1 + kh(\pi)^2 \geq 0 \tag{1.44}$$

where $k = \frac{\psi[R-U]}{4\alpha}\left(4n - 3 - \frac{\overline{\alpha}}{\underline{\alpha}}\right)$. Since $H_p(0) = -1 < 0$, a sufficient condition for the threshold to be uniquely defined is that the first derivative of expression $H_p(.)$ to be positive. This will be the case as long as the following conditions hold:

$$n > \frac{1}{4}\left(3 + \frac{\overline{\alpha}}{\underline{\alpha}}\right) \tag{1.45}$$

$$\frac{1}{kh(\pi)} > -h'(\pi) \tag{1.46}$$

Condition (1.45) requires the number of villages to be large enough so that one village head deviation does not have a too large impact on the electoral result. The second condition is always satisfied for $\pi \in [0, \frac{1}{2}]$ because $h'(\pi)$ is positive for those values of π. For values of π higher than $\frac{1}{2}$, the second condition requires the values of function $h(.)$ and its first derivative are not too large in absolute values.

Thresholds Separating Equilibria

By a similar analysis, the upper threshold of a separating equilibria is defined by (1.25) becomes

$$H_{sep}(\pi) \equiv 2\pi - 1 + k^{sep}(\pi)h(\pi)^2 \leq 0$$

where $k^{sep}(\pi) = \frac{\psi[R-U]}{4\underline{\alpha}\overline{\alpha}}[4n\overline{\alpha}(2\gamma(\pi) - 1) + 3\overline{\alpha} - \underline{\alpha}]$. Let us express $\gamma(\pi) = c + \xi(\pi)$ where $0 < c < 1$, $\xi(0) = 0$ and $\xi'() > 0$. Since $H_{sep}(0) = -1 < 0$, a sufficient condition for the threshold to be uniquely defined is $H'_{sep}(.) > 0$. This will be the case if the following conditions

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hold:

$$c > \frac{1}{2} - \frac{1}{8n}\left(3 - \frac{\alpha}{\overline{\overline{\alpha}}}\right)$$

$$\frac{1 + \frac{n\psi[R\text{-}\underline{U}]}{\alpha}h(\pi)^2}{k^{sep}(\pi)h(\pi)} > -h'(\pi)$$

Therefore, similarly as before, as long as n is high enough and function $h(.)$ is not too sensitive to π, the threshold implicitly defined by $H_{sep}(\pi) = 0$ will be well defined.

The analysis on the lower threshold of the separating equilibria and the threshold for pooling for party B are symmetric to these analyzed here and are, therefore, ommited from the paper.

Data Appendix

The main data set used in this paper is constructed by merging different waves of the Indonesian Village Census PODES. For Tables 1 to 7, I use data from the 1996, 2000 and 2003 waves of the PODES data set. To match observations across the different waves I request the village to have the same name and to be in the same district. Out of the 66,000 villages of Indonesia, 10,000 do not have an exact match across these three waves. Then, I conduct a series of merge checks to ensure that I am identifying the exact same village. Those merge checks are based on the number of the population of the village, the number of religious, educational and health facilities. I drop observations for which on more than two categories are inconsistent across waves. This process eliminates 8,000 additional observations. Finally, I restrict the sample to those districts in which there is enough overlap between desa and kelurahan. Hence, I do not use on my analysis those municipalities for which there are less than 5 *kelurahan* or less than 5 *desa*. This reduces the main sample by 10,000 additional observations.

Data Sources

The data on the electoral results at the village level for the parliamentary election of 1971 and 1987, used for the robustness check of endogenous selection of kelurahan, was generously provided by Professor Dwight King, from Northern Illinois University.

The data on the occupational composition of villages used for robustness check in section 6.2., was constructed from the National Socioeconomic Survey (SUSENAS). This survey is conducted on a nationally representative sample of households. I constructed aggregates at the village level for the responses given and match those to my baseline data. Since not all the villages in Indonesia had respondents in this household survey, the sample of analysis drops to 4,300 villages.

Finally, the data used for the democratic capital robustness check, was generously shared by Vivi Alatas, Abhijit Banerjee, Rema Hanna, Julia Tobias and Ben Olken. This data was collected for their project "How to Target the Poor: Evidence from a Field Experiment in Indonesia". 9 respondents were interviewed per village on a total of 258 kelurahan villages and 382 desa villages. The survey was conducted in late 2008 in the provinces of Central Java, South Sulawesi, and North Sumatra.

1.10 Figures

Figure 1.

Individual Effort and Proportion of dictator's party sympathizers
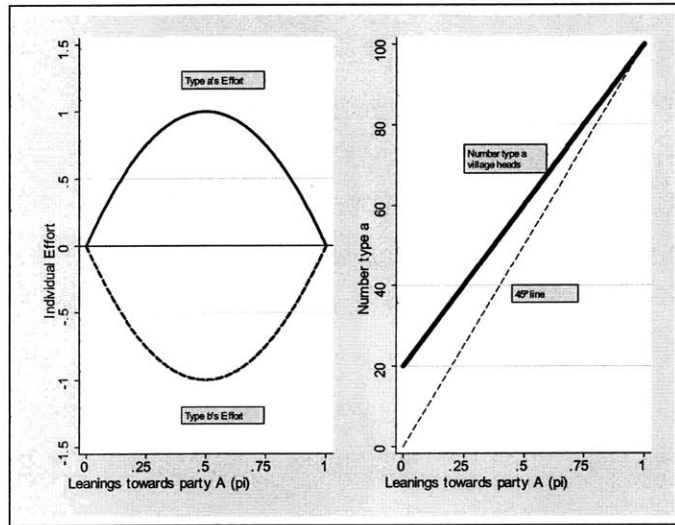
Figure 2. Total Effort
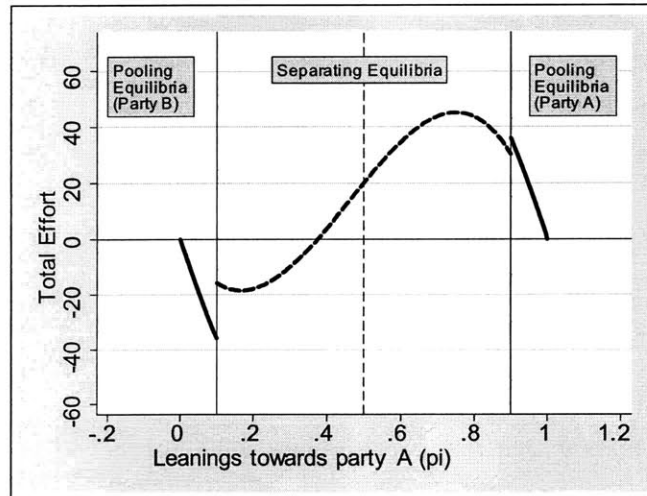
Figures 3A and 3B. Estimated Propensity Score distribution
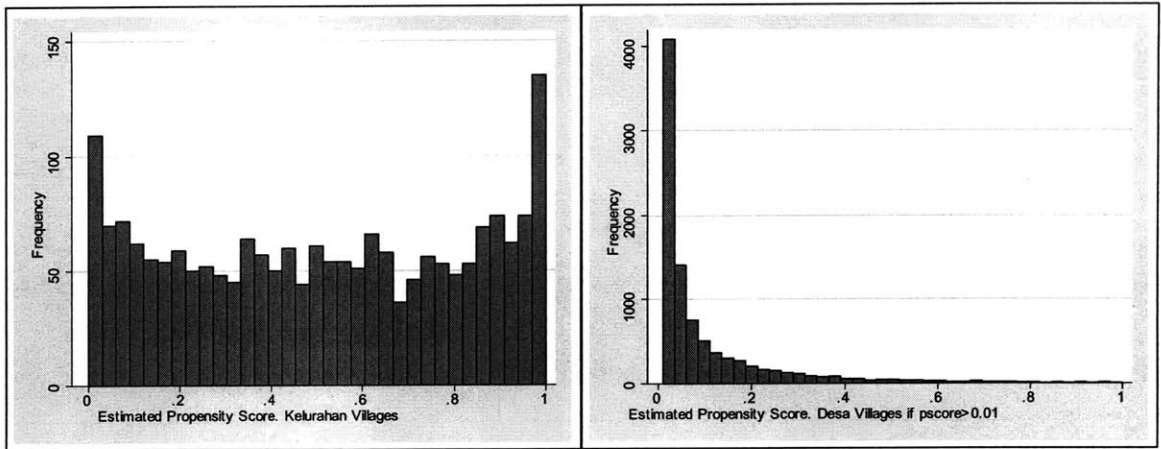
Figure 4. Heterogenous Effects
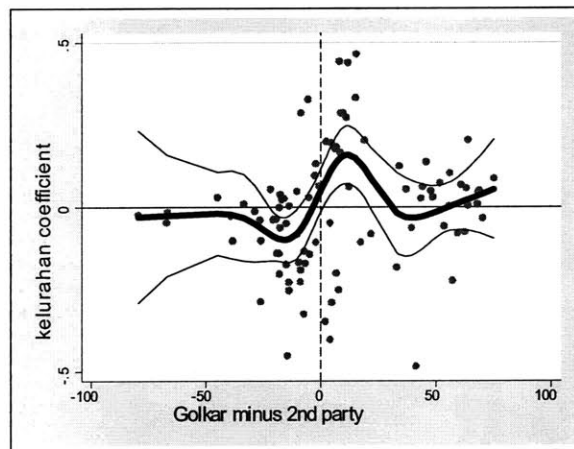
Figures 5A and 5B. Average Propensity Score of Kelurahan
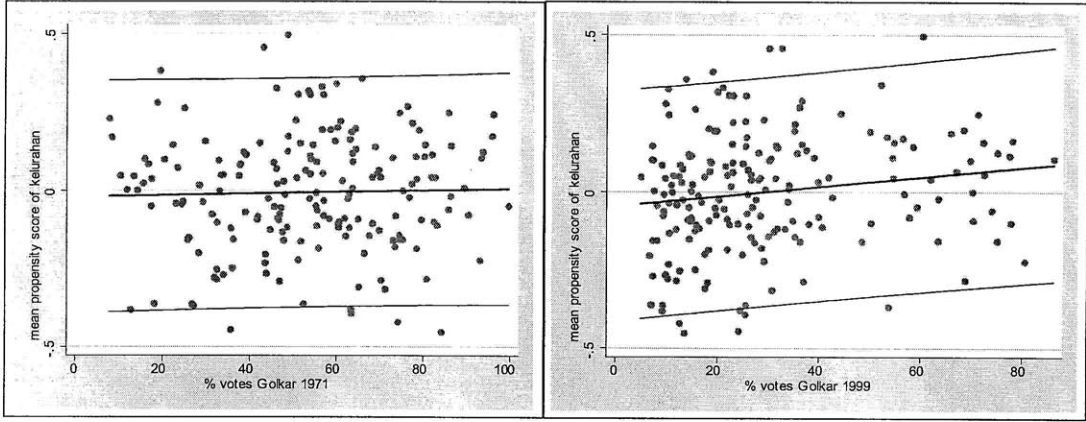
Figure 6. Dynamic Effects
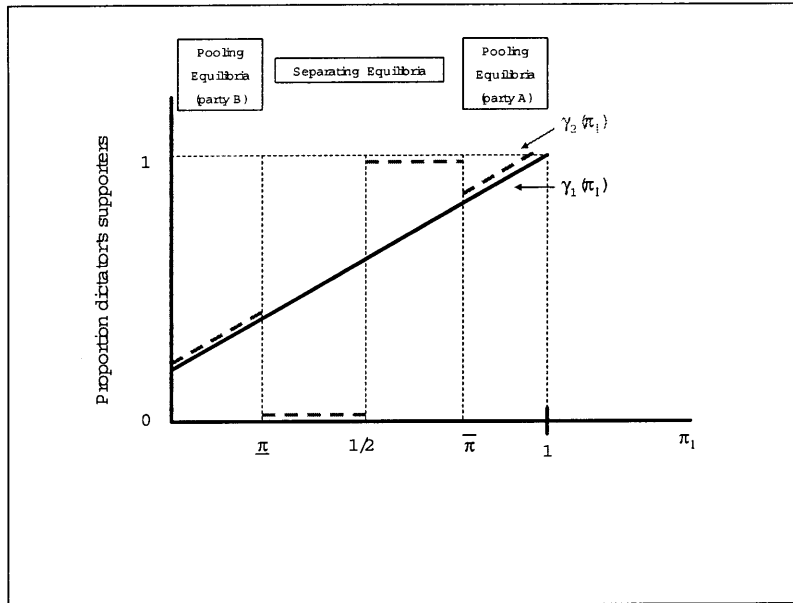
Figure 7. Intuitive Criterion

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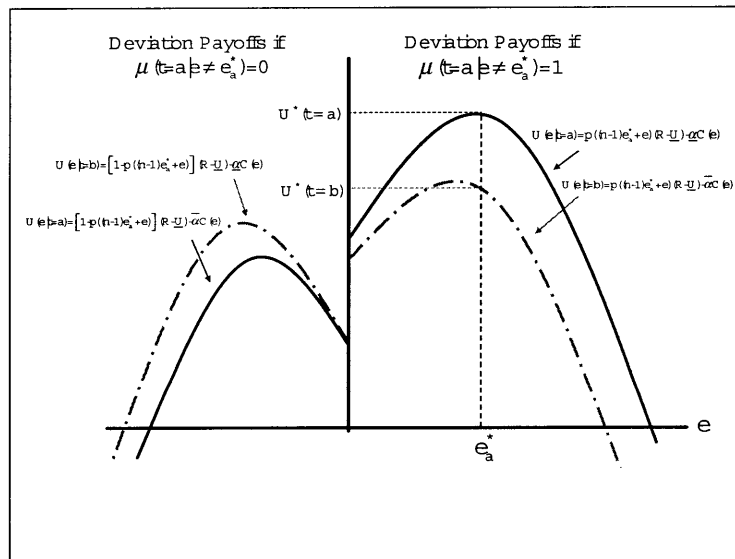
Table 1: Descriptive Statistics

	Whole Sample			Kelurahan		Desa	
	Obs (1)	Mean (2)	Std. Dev. (3)	Mean (4)	Std. Dev. (5)	Mean (6)	Std. Dev. (7)
Electoral Variables:							
% villages Golkar 1st in 1999	39,597	0.29	0.45	0.39	0.49	0.28	0.45
% villages PDI-P 1st in 1999	39,597	0.47	0.50	0.46	0.50	0.47	0.50
% villages PPP 1st in 1999	39,597	0.11	0.32	0.07	0.25	0.12	0.32
% villages PKB 1st in 1999	39,597	0.09	0.29	0.04	0.20	0.09	0.29
% villages Other Party 1st in 1999	39,597	0.04	0.19	0.04	0.19	0.04	0.19
% villages Golkar 1st in 2004	29,970	0.35	0.48	0.49	0.50	0.34	0.47
% villages PDI-P 1st in 2004	29,970	0.29	0.45	0.24	0.43	0.29	0.46
% villages PPP 1st in 2004	29,970	0.15	0.36	0.10	0.30	0.15	0.36
% villages PKB 1st in 2004	29,970	0.06	0.24	0.03	0.18	0.06	0.24
% villages Other Party 1st in 2004	29,970	0.11	0.31	0.07	0.26	0.11	0.31
Geographic controls							
kelurahan dummy	39,597	0.05	0.22	1	0	0	0
urban dummy	39,597	0.08	0.28	0.57	0.50	0.06	0.23
% HH in agr	36,842	69.90	23.78	35.75	30.19	71.90	21.74
% land in agriculture	36,842	76.69	21.62	54.60	32.35	77.99	20.08
high altitude dummy	36,842	0.28	0.45	0.16	0.37	0.29	0.45
population	36,842	2,783	2,371	4,906	3,929	2,658	2,183
population density (#people/ha)	36,842	0.99	2.67	3.72	8.98	0.84	1.54
village area (in ha)	36,842	18,148	85,900	9,795	29,499	18,637	88,065
distance sub-distr office (km)	39,597	11.11	26.60	2.75	4.96	11.56	27.22
subdistrict capital	39,597	0.05	0.22	0.17	0.38	0.04	0.19
Religious Controls							
num mosques / 1000 villagers	36,842	1.25	1.36	0.76	0.67	1.28	1.38
num prayerhouse / 1000 villagers	36,842	2.73	3.51	1.37	1.52	2.81	3.58
num churches / 1000 villagers	36,842	0.45	1.28	0.24	0.56	0.46	1.31
num buddhist temple / 1000 villagers	36,842	0.01	0.12	0.01	0.06	0.01	0.12
Facilities controls							
Village has road	34,783	0.91	0.29	0.99	0.10	0.90	0.30
Village has asphalt road	36,842	0.56	0.50	0.88	0.32	0.54	0.50
num TVs / 1000 villagers	36,842	42.24	42.21	88.45	53.90	39.54	39.79
num hospitals / 1000 villagers	36,842	0.003	0.04	0.022	0.08	0.002	0.03
num maternity hopitals / 1000 villagers	36,842	0.005	0.31	0.015	0.07	0.005	0.31
num polyclinic / 1000 villagers	36,842	0.010	0.09	0.027	0.09	0.009	0.09
num puskesmas / 1000 villagers	36,842	0.039	0.17	0.066	0.16	0.037	0.18
num kindgarden / 1000 villagers	36,842	0.18	0.35	0.31	0.31	0.18	0.35
num primary school / 1000 villagers	36,842	1.25	1.33	0.96	0.76	1.26	1.35
num high school / 1000 villagers	36,842	0.17	0.46	0.42	0.56	0.16	0.45

Additional Statistics	
Number of districts	197
Number of subdistricts	2,627
Number of villages per district	201
Number of kelurahan per district	10.34
% of kelurahan per district	0.09
Number of population per district	520,382

Number of districts by most voted party in the 1999 election

	Most voted	Second most voted
PDI-P	98	56
Golkar	75	64
PKB	13	31
PPP	9	34
PAN	1	10
PDKB	0	1
no data	1	1
TOTAL	197	197

Table 2: Baseline Specification. OLS results

Dependent variable: Golkar wins in 1999	Restricted Sample				Whole Sample
	(1)	(2)	(3)	(4)	(5)
kelurahan	0.0240*	0.0541***	0.0547***	0.0513***	0.0523***
	(0.0126)	(0.0140)	(0.0137)	(0.0138)	(0.0120)
urban	-0.0360***	-0.0116	-0.0091	-0.0095	-0.0098
	(0.0105)	(0.0112)	(0.0109)	(0.0113)	(0.0098)
% HH in agr		-0.0033	-0.0031	-0.0035	-0.0031
		(0.0033)	(0.0032)	(0.0030)	(0.0022)
% land in agr		0.0189	0.0218	0.0409*	0.0546***
		(0.0213)	(0.0219)	(0.0212)	(0.0186)
high altitude		0.0253**	0.0255**	0.0273**	0.0203**
		(0.0111)	(0.0107)	(0.0110)	(0.0095)
log population		1.0074	2.8683***	2.5848**	1.2960*
		(0.8331)	(1.0410)	(1.0726)	(0.7559)
population density		-0.0029**	-0.0026**	-0.0024**	-0.0008
		(0.0014)	(0.0012)	(0.0012)	(0.0006)
distance sub-distr office		0.0004***	0.0005***	0.0003	0.0003
		(0.0001)	(0.0001)	(0.0002)	(0.0002)
num mosques pc.			20.7508***	18.3965***	16.6670***
			(3.4456)	(3.3915)	(2.9665)
num prayerhouse pc.			-0.7529	-1.1336	-0.0852
			(1.2254)	(1.3044)	(1.2288)
num churches pc.			-8.3327	-11.1666*	-12.2663**
			(5.2569)	(5.7297)	(5.0951)
num hindu temple pc.			13.4817	4.6517	-0.2056
			(26.2767)	(26.8027)	(20.1304)
num hospitals pc.				0.0773*	0.0829**
				(0.0450)	(0.0376)
num puskesmas pc.				0.0222	0.0262*
				(0.0163)	(0.0138)
num road pc.				0.0057	0.0070*
				(0.0050)	(0.0040)
num kindgarden pc.				-0.0241***	-0.0228***
				(0.0078)	(0.0070)
num primary school pc.				0.0024	0.0018
				(0.0022)	(0.0020)
District FE	Y	Y	Y	Y	Y
Other Controls	N	N	N	Y	Y
Observations	36842	36842	36842	34783	43553
R-squared	0.398	0.407	0.410	0.418	0.412

Notes: Robust Standard errors clustered at the district level in parenthesis. Ordinary Least Squares regressions that includes a full of district fixed effects. The unit of observation is the village level. The dependent variable is a dummy that takes value 1 if Golkar was the most voted party in the village in the Parliamentary election of 1999 and 0 otherwise. All regressions include a quartic of the variables percentage of households in agriculture and log population. Facilities variables are defined per 1,000 people in the village. Other controls are number of TVs, number of maternity hospitals, number of polyclinics, dummy for whether the village has an asphalt road and the number of high schools. *** p<0.01, ** p<0.05, * p<0.1

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Table 3A. Propensity Score Matching. Probit Estimation

Dependent variable kelurahan village	(1)	(2)	(3)
urban	0.9017***	0.8803***	0.7657***
	(0.0535)	(0.0538)	(0.0556)
% HH in agr	-0.0792***	-0.0786***	-0.0716***
	(0.0111)	(0.0111)	(0.0114)
% land in agr	-0.4218***	-0.4166***	-0.4531***
	(0.0833)	(0.0835)	(0.0897)
high altitude	0.0593	0.0757	0.0878*
	(0.0493)	(0.0499)	(0.0514)
log population	-13.1836**	-22.0521**	12.6202
	(6.5117)	(9.7974)	(18.8202)
population density	0.0344***	0.0313***	0.0305***
	(0.0060)	(0.0059)	(0.0060)
distance sub-distr office	-0.0485***	-0.0480***	-0.0407***
	(0.0033)	(0.0033)	(0.0036)
num mosques pc.		-93.1383***	-107.3868***
		(27.3681)	(28.1162)
num prayerhouse pc.		-74.8851***	-82.0017***
		(13.3810)	(14.0258)
num churches pc.		-108.6375***	-113.4421***
		(32.8425)	(36.2296)
num hindu temple pc.		-144.6544	-108.2913
		(233.3134)	(254.1095)
num hospitals pc.			0.8265***
			(0.2749)
num puskesmas pc.			0.0250
			(0.1009)
asphalt road pc.			0.1979***
			(0.0751)
num primary school pc.			-0.0205
			(0.0231)
num high school pc.			0.1757***
			(0.0312)
District Dummies	Y	Y	Y
Other Controls	N	N	Y
Observations	36279	36279	34152

Standard errors in parentheses. Probit regressions that include a full set of district dummies. The unit of observation is the village level. The dependent variable takes value 1 if the village is a kelurahan and 0 if it is a desa. All regressions include a quartic of the variables percentage of households in aggriculture and log population. Facilities variables are defined per 1,000 people in the village. Other controls are number of TVs, number of maternity hospitals, number of polyclinics, dummy for whether the village has a road and the number of kinder gardens. *** p<0.01, ** p<0.05, * p<0.1

Table 3B. Second Stage. Propensity Score Matching. Block Method

	Pscore computed using Geographic Controls		Pscore computed using Geographic + Religion Controls		Pscore computed using Geographic + Religion + Facilities Controls	
	pscore [0.01, 0.5] (1)	pscore [0.01, 0.8] (2)	pscore [0.01, 0.5] (3)	pscore [0.01, 0.8] (4)	pscore [0.01, 0.5] (5)	pscore [0.01, 0.8] (6)
kelurahan	0.0637***	0.0512***	0.0584***	0.0490***	0.0603***	0.0469***
	(0.0138)	(0.0128)	(0.0148)	(0.0119)	(0.0137)	(0.0116)
Observations	11012	11763	10716	11472	9837	10609
R-squared	0.464	0.466	0.461	0.465	0.469	0.475

Notes: Each column corresponds to an OLS regression in which the dependent variable takes value 1 if Golkar was the most voted party in the village. The regressors are the kelurahan dummy, whose coefficient is displayed, and a full set of district fixed effects interacted with propensity score percentile dummies (dummies that take value 1 if the propensity score of a village is below the 20th percentile in their municipality, between the 20th and 40th percentile, and so on). To ensure a sufficient amount of overlap I restrict the sample to villages that have propensity score between 0.01 and 0.5, columns (1), (3) and (5) or to villages with propensity score between 0.01 and 0.8, columns (2), (4) and (6).

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Table 4: Electoral Results 1999 by Subsample

	Dependent variable: Golkar wins in 1999					Dependent Variable: PDI-P wins in 1999				
	Whole sample	PDI-P Won Large 1999	PDI-P Just Won 1999	Golkar Just Won 1999	Golkar Won Large 1999	Whole sample	PDI-P Won Large 1999	PDI-P Just Won 1999	Golkar Just Won 1999	Golkar Won Large 1999
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
kelurahan	0.0513***	0.0066	0.0477	0.1327**	0.0388**	-0.0036	0.0435**	0.0097	-0.0410	-0.0246
	(0.0138)	(0.0164)	(0.0342)	(0.0500)	(0.0182)	(0.0160)	(0.0209)	(0.0518)	(0.0514)	(0.0186)
Geographic Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Religion Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Facilities Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	34783	13147	7600	4073	4675	34783	13147	7600	4073	4675
R-squared	0.418	0.110	0.172	0.083	0.153	0.354	0.101	0.063	0.105	0.126
Districts	183	68	34	29	52	183	68	34	29	52

Notes: Robust Standard errors clustered at the district level in parenthesis. Ordinary Least Squares regression with district fixed effects. The unit of observation is the village level. The dependent variable for columns (1) to (5) is a dummy that takes value 1 if Golkar was the most voted party in the village in the Parliamentary election of 1999 and 0 otherwise. The dependent variable for columns (6) to (10) is a dummy that takes value 1 if PDI-P was the most voted party in the village in the Parliamentary election of 1999 and 0 otherwise. Columns (2) to (5) and (7) to (10) correspond to the same regression run in a sub-sample. Columns (2) and (7) restrict the sample to districts in which Golkar won by more than 10 percentage points with respect to the second most voted party. Columns (3) and (8) restrict the sample to districts in which Golkar won by less than 10 percentage points. Similarly for columns (4), (9) and (5), (10). The detailed list of controls included in each regression can be seen in the Table 1 Descriptive Statistics.

Table 5. Controls for Conflict, Military Presence and Mining

Dependent variable: Golkar wins in 1999	(1)	(2)	(3)	(4)	(5)
kelurahan	0.0513***	0.0512***	0.0494***	0.0513***	0.0492***
	(0.0138)	(0.0138)	(0.0137)	(0.0138)	(0.0138)
conflict in 2002	-0.0026				-0.0479
	(0.0089)				(0.0772)
conflict among villagers		-0.0045			0.0438
		(0.0086)			(0.0775)
conflict villagers & gov apparatus		-0.0072			0.0380
		(0.0328)			(0.0783)
conflict between students		0.0654			0.1178
		(0.0480)			(0.0942)
ethnic conflict		-0.0477			0.0000
		(0.0771)			(0.0000)
other conflict		0.0017			0.0499
		(0.0271)			(0.0821)
army presence			0.0031		0.0034
			(0.0051)		(0.0050)
number army members			0.0001		0.0001
			(0.0001)		(0.0001)
Kamling Post			0.0090		0.0093
			(0.0134)		(0.0134)
Police Station			0.0321***		0.0320***
			(0.0093)		(0.0093)
Police Post			0.0175		0.0176
			(0.0113)		(0.0113)
% HH mining				-0.0009	-0.0009
				(0.0009)	(0.0008)
quarried coralstone				0.0135*	0.0129*
				(0.0075)	(0.0074)
quarried sand				-0.0126**	-0.0133**
				(0.0064)	(0.0063)
quarried lime				-0.0067	-0.0067
				(0.0179)	(0.0177)
quarried sulfur				-0.1681***	-0.1683***
				(0.0569)	(0.0574)
quarried kaolin				0.2134*	0.2155*
				(0.1153)	(0.1154)
quarried kwarsa				-0.0357	-0.0355
				(0.0375)	(0.0372)
Geographic Controls	Y	Y	Y	Y	Y
Religious Controls	Y	Y	Y	Y	Y
Facilities Controls	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y
Observations	27695	27693	27695	27695	27695
R-squared	0.435	0.435	0.435	0.435	0.436

Notes: Robust Standard errors clustered at the district level in parenthesis. Ordinary Least Squares regressions that include a full set of district fixed effects. The unit of observation is the village level. The dependent variable is a dummy that takes value 1 if Golkar was the most voted party in the village in the 1999 Parliamentary Election and 0 otherwise. *** p<0.01, ** p<0.05, * p<0.1

Table 6. Controling for Changes in Facilities and Village Funding

Dependent variable: Golkar wins in 1999	(1)	(2)	(3)	(4)	(5)
kelurahan	**0.0538*****	**0.0547*****	**0.0534*****	**0.0524*****	**0.0612*****
	(0.0150)	**(0.0139)**	**(0.0135)**	**(0.0140)**	**(0.0151)**
change hospitals 96 -99	-0.0070				-0.0086
	(0.0326)				(0.0322)
change puskesmas 96-99	-0.0017				-0.0017
	(0.0054)				(0.0054)
change maternity hosp 96-99	0.0152				0.0141
	(0.0224)				(0.0221)
change polyclinic 96-99	0.0498***				0.0507***
	(0.0105)				(0.0106)
change kinder garden 96-99	-0.0012				-0.0009
	(0.0019)				(0.0019)
change primary schools 96-99	0.0030				0.0027
	(0.0034)				(0.0034)
(ch hosp 96-99)*kelur	-0.0291				-0.0286
	(0.0666)				(0.0669)
(ch puskesmas 96-99)*kelur	-0.0068				-0.0073
	(0.0142)				(0.0137)
(ch maternity 96-99)*kelur	0.0327				0.0338
	(0.0332)				(0.0336)
(ch polyclinic 96-99)*kelur	-0.0280				-0.0301
	(0.0204)				(0.0206)
(ch kinder garden 96-99)*kelur	0.0016				0.0009
	(0.0064)				(0.0065)
(ch primary sch 96-99)*kelur	-0.0102				-0.0098
	(0.0101)				(0.0099)
% change funds District gov 96-03		-0.0019**			-0.0016*
		(0.0009)			(0.0009)
% change funds Prov gov 96-03		-0.0001			-0.0001
		(0.0010)			(0.0010)
% change funds Central gov 96-03		0.0002			0.0002
		(0.0007)			(0.0008)
(% ch District Gov)*kelur		0.0004			-0.0008
		(0.0021)			(0.0023)
(% ch Prov Gov)*kelur		0.0000			0.0006
		(0.0024)			(0.0025)
(% ch Central Gov)*kelur		-0.0015			-0.0023
		(0.0023)			(0.0023)
% change Regular Expenditures 96-03			0.0007		0.0004
			(0.0018)		(0.0019)
% change Development Expenditures 96-03			-0.0020		-0.0011
			(0.0014)		(0.0014)
(% ch Reg Exp)*kelur			-0.0007		-0.0013
			(0.0053)		(0.0056)
(%ch Dev Exp)*kelur			0.0027		0.0032
			(0.0036)		(0.0037)
IDT receipient				0.0200**	0.0196**
				(0.0087)	(0.0084)
(IDT receipient)*kelur				-0.0675	-0.0702
				(0.0494)	(0.0489)
% HH received IDT funds				0.0000	0.0000
				(0.0003)	(0.0003)
(% HH receive IDT)*kelur				0.0029	0.0030
				(0.0020)	(0.0019)
Geographic Controls	Y	Y	Y	Y	Y
Religious Controls	Y	Y	Y	Y	Y
Facilities Controls	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y
Observations	33904	34780	34780	34591	33710
R-squared	0.420	0.418	0.418	0.419	0.421

Notes: Robust Standard errors clustered at the district level in parenthesis. Ordinary Least Squares regressions that include a full set of district fixed effects. The unit of observation is the village level. The dependent variable is a dummy that takes value 1 if Golkar was the most voted party in the village in the 1999 Parliamentary Election and 0 otherwise. *** p<0.01, ** p<0.05, * p<0.1

Table 7. Controling for the Occupational Composition of the Village

Dependent variable: Golkar wins in 1999	(1)	(2)	(3)	(4)
kelurahan	**0.0392****	**0.107****	**0.0833***	**0.141***
	(0.0167)	**(0.0451)**	**(0.0503)**	**(0.0796)**
% government employees		0.189***		0.248***
		(0.0667)		(0.0779)
% private employees		0.0242		0.0203
		(0.0423)		(0.0500)
% employers		0.106		0.105
		(0.119)		(0.120)
% temporary workers		0.0150		-0.0108
		(0.0259)		(0.0267)
% family employees		-0.207**		-0.226***
		(0.0852)		(0.0857)
(% government employees)*kelur		-0.0784		-0.146
		(0.115)		(0.138)
(% private employees)*kelur		-0.151		-0.144
		(0.101)		(0.121)
(% employers)*kelur		-0.353		-0.345
		(0.290)		(0.294)
(% temporary workers)*kelur		-0.120		-0.0961
		(0.0809)		(0.0876)
(% family employees)*kelur		0.0416		0.165
		(0.330)		(0.335)
% HH in agriculture			0.00245	0.0797**
			(0.0291)	(0.0364)
% HH in mining			-0.0133	0.0514
			(0.105)	(0.109)
% HH in industry			0.0389	0.104*
			(0.0490)	(0.0594)
% HH in electricity			-0.113	-0.0904
			(0.219)	(0.228)
% HH in construction			-0.0774	-0.0253
			(0.0634)	(0.0786)
% HH in trading			-0.0705	0.00658
			(0.0543)	(0.0577)
(% HH in agriculture)*kelur			-0.0469	-0.0480
			(0.0640)	(0.0930)
(% HH in mining)*kelur			-0.874**	-0.768**
			(0.341)	(0.346)
(% HH in industry)*kelur			-0.154	-0.0829
			(0.103)	(0.118)
(% HH in electricity)*kelur			-0.618	-0.414
			(0.649)	(0.693)
(% HH in construction)*kelur			0.235	0.314
			(0.185)	(0.200)
(% HH in trading)*kelur			-0.127	-0.112
			(0.142)	(0.149)
Geographic Controls	Y	Y	Y	Y
Religious Controls	Y	Y	Y	Y
Facilities Controls	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Observations	4297	4297	4297	4297
R-squared	0.552	0.554	0.555	0.554

Notes: Robust Standard errors clustered at the municipality level in parenthesis. Ordinary Least Squares regressions that include a full set of municipality fixed effects. The unit of observation is the village level. The dependent variable is a dummy that takes value 1 if Golkar was the most voted party in the village in the 1999 Parliamentary Election and 0 otherwise. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Democratic Capital Hypothesis

		Coefficients on kelur dummy	
Dependent variables:	Sample Mean	No controls	All controls & District FE
	(1)	(2)	(3)
% HH in the village that agree with the statement that [...] can be trusted			
most people	0.261	0.0880*** (0.0331)	0.1018** (0.0435)
people in this halmet	0.642	-0.0117 (0.0337)	0.0192 (0.0456)
village head	0.768	-0.0086 (0.0294)	-0.0441 (0.0398)
local government	0.644	0.0692* (0.0361)	0.0143 (0.0409)
the president	0.713	0.0596** (0.0296)	0.0138 (0.0362)
% HH in the village that participates in each type of organization			
government	0.306	-0.0823* (0.0486)	0.0193 (0.0471)
religious	0.565	-0.1477** (0.0591)	-0.0405 (0.0319)
recreational	0.0971	-0.0659*** (0.0244)	-0.0281 (0.0250)
political	0.0309	-0.0010 (0.0110)	-0.0094 (0.0150)
% HH heads that voted in the 2004 elections	0.935	0.0034 (0.0149)	-0.0034 (0.0205)
% of HH that agree with the statement that his/her vote is influenced by [...] factor			
ethnic	0.250	-0.0338 (0.0351)	-0.0240 (0.0468)
religious	0.401	-0.0745* (0.0399)	-0.0555 (0.0517)
program of candidate	0.483	0.0020 (0.0399)	-0.1152** (0.0490)
performance of candidate	0.491	0.0329 (0.0402)	-0.0681 (0.0499)
% of HH that think corruption there is low corruption at [...] level			
central government	0.109	-0.0290 (0.0192)	-0.0020 (0.0252)
district government	0.241	-0.0800** (0.0319)	-0.0567 (0.0370)
village government	0.634	-0.1326*** (0.0361)	-0.1213*** (0.0443)

Notes: Robust Standard errors clustered at the district level in parenthesis. Ordinary Least Square Regressions in which the unit of observation is the village level. Column (2) displays the coefficient of the kelurahan dummy in a regression in which the dependent variable is as defined by each row. No further controls are added in column (2). Column (3) displays the coefficient of the kelurahan dummy when geographic, religious and facilities controls and district fixed effects are also included. The data comes from a survey conducted in 2008 for the project "How to Target the Poor: Evidence from a Field Experiment in Indonesia" (Vivi Alatas, Abhijit Banerjee, Ben Olken, Rema Hanna, and Julia Tobias). The results displayed comes from 5 districts in the provinces of Central Java and South Sulawesi. There are 198 villages in the sample, 59 kelurahan, 139 desa. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Electoral Results 2004 by Subsample

	Dependent variable: Golkar wins in 2004					Dependent Variable: PDI-P wins in 2004				
	Whole sample	PDI-P Won Large 1999	PDI-P Just Won 1999	Golkar Just Won 1999	Golkar Won Large 1999	Whole sample	PDI-P Won Large 1999	PDI-P Just Won 1999	Golkar Just Won 1999	Golkar Won Large 1999
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
kelurahan	0.0884***	0.1089***	0.0903**	0.1183***	0.0278	0.0076	0.0298	-0.0282	-0.0104	0.0079
	(0.0154)	(0.0295)	(0.0382)	(0.0368)	(0.0324)	(0.0127)	(0.0238)	(0.0267)	(0.0183)	(0.0068)
Geographic Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Religion Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Facilities Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	29970	14518	7796	3587	4069	29970	14518	7796	3587	4069
R-squared	0.328	0.181	0.264	0.192	0.146	0.294	0.281	0.140	0.113	0.151
Districts	171	66	28	26	51	171	66	28	26	51

Notes: Robust Standard errors clustered at the district level in parenthesis. Ordinary Least Squares regression with district fixed effects. The unit of observation is the village level. The dependent variable for columns (1) to (5) is a dummy that takes value 1 if Golkar was the most voted party in the village in the district elections of 2004 and 0 otherwise. The dependent variable for columns (6) to (10) is a dummy that takes value 1 if PDI-P was the most voted party in the village in the district election of 2004 and 0 otherwise. Columns (2) to (5) and (7) to (10) correspond to the same regression run in a sub-sample. Columns (2) and (7) restrict the sample to districts in which Golkar won by more than 10 percentage points with respect to the second most voted party. Columns (3) and (8) restrict the sample to districts in which Golkar won by less than 10 percentage points. Similarly for columns (4), (9) and (5), (10). The detailed list of controls included in each regression can be seen in the Table 1 Descriptive Statistics.

Appendix Table 1: Endogenity Check

Dependent variable: average propensity score of kelurahan	(1)	(2)
Vote Share Golkar 1971	0.0247	
	(0.0648)	
Vote Share Golkar 1999		0.153**
		(0.0692)
Constant	-0.0184	-0.0452*
	(0.0373)	(0.0246)
Observations	182	189
R-squared	0.001	0.025

Standard errors in parenthesis. OLS regressions were the unit of observation is the district level. The dependent variable is the demeaned average of the propensity score estimate among kelurahans at the district level. *** p<0.01, ** p<0.05, * p<0.1

Appendix Table 2

	PDI-P Won Large 1999 (1)	PDI-P Just Won 1999 (2)	Golkar Just Won 1999 (3)	Golkar Won Large 1999 (4)	Total (5)
(A) i-P Won Large 2004	0.0060	0.0771			0.0136
	(0.0192)	(0.0000)			(0.0189)
servations	3937	236	0	0	4173
tricts	21	2	0	0	23
(B) i-P Just Won 2004	0.1298*	0.1579			0.1288**
	(0.0631)	(0.1027)			(0.0505)
servations	3722	1489			5317
tricts	19	9			29
(C) kar Just Won 2004	0.2467***	-0.0097	0.1436***	-0.0041	0.0727
	(0.0831)	(0.0688)	(0.0302)	(0.1305)	(0.0494)
servations	2500	1831	615	210	5278
tricts	25	16	19	9	69
(D) kar Won Large 2004			0.1249*	0.0318	0.0777***
			(0.0584)	(0.0327)	(0.0285)
servations			2298	3859	8033
tricts	1	1	6	42	50
(E) al	0.1089***	0.0903**	0.1183***	0.0278	0.0884***
	(0.0295)	(0.0382)	(0.0368)	(0.0324)	-0.0154
servations	11451	6308	3587	4069	29970
tricts	66	28	26	51	171

tes: Robust Standard errors clustered at the district level in parenthesis. Each cell corresponds to a different Ordinary Least Squares regression that includes a full set of geographic [con]trols, religious controls, facilities controls and municipality fixed effects. (For a detailed list of controls see Table 1. Descriptive Statistics). The unit of observation is the village level. The [de]pendent variable is a dummy that takes value 1 if Golkar was the most voted party in the village in the Parliamentary election of 2004 and 0 otherwise. The sample is splitted along two [dim]ensions: the electoral result at the municipality level in the 1999 election (columns (1) to (4)) and the electoral result at the municipality level in the 2004 election (rows (A) to (D)). Winni[ng] [...]ge means by more than 10 percentage points with respect to the 2nd most voted party and just winning stand for a margin of victory smaller than 10 percentage points.

Chapter 2

Accountability and Growth: The Costs of Village Democracy in China[1]

2.1 Introduction

The relationship between democracy and economic growth is a question of central interest to economists and political scientists.[2] A key difference between democracy and autocracy is the degree and the method of holding politicians accountable to citizens. This paper studies the effect of the largest scaled reform of leader accountability in history. During the 1980s, village level elections were introduced in rural China, affecting over one billion people. These elections shifted the accountability of the village leader from the Chinese Communist Party (CCP) towards villagers. Our study aims to document these elections and to evaluate the impact they had on economic performance.

The existing empirical evidence on the impact of electoral institutions and accountability is problematic. Most of this evidence comes from cross-country comparisons which suffer from

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[1] This chapter is the result of joint work with Professor Nancy Qian, Professor Gerard Padró-i-Miquel and Professor Yang Yao.

[2] For example, see Besley and Kudamatsu (2007) for a documentation of the differences in electoral regimes and economic performance.

obvious omitted variables bias. Moreover, institutions are often bundled together such that it is difficult to identify the impact of particular elements, such as the importance of leadership accountability.

The nature of the reforms in China offers an unprecedented opportunity in allowing us to address many of these problems. The electoral reforms were controlled in that other institutions were largely held constant as leadership accountability shifted. The staggered timing of these reforms allows us to use a fixed effects strategy which controls for time-invariant differences between regions and secular changes over time.

Village elections were first introduced in rural China during 1980s. The central government in Beijing advocated for them in order to solve the information problems associated to governing the large, heterogeneous and rapidly changing Chinese economy. The reform was implemented in two phases. In the first phase, villagers were able to elect their village chief among a set of candidates nominated by the local branch of the CCP. This shifted accountability of the elected officials from being only accountable to the CCP, to both the CCP and villagers. The second phase of the reform, called *haixuan* which literally means "an ocean of choices", opened nominations to voters. This further shifted the accountability of the elected officials so that they responded directly to the villagers.

The first contribution of our study is to systematically document these elections. For this aim, we conducted a survey on the history and nature of electoral reforms in a national representative sample of 266 villages. In particular, we surveyed all current and past village officials on the timing of the reforms, the powers of the village committee (which was the object of the reforms) and the Communist Party branch in the villages (which was not affected by the reforms), and the characteristics of leaders during 1980-2005. We then match our survey data to a village-level panel on economic outcomes that was collected contemporaneously. The matched panel covers 266 villages over 1987-2005.

The second and main contribution of our study is to examine the impact of elections on economic performance and social outcomes. To illustrate the channels through which a shift in accountability can affect these outcomes, we develop a simple theoretical framework in which we compare the differences between an appointment and an election system for the selection of local politicians. In the appointment system, the local politician is held accountable by an

upper-level of government: the appointed local politician will only be reappointed for a second term if he is able to achieve a certain income growth target for his village. This specification is motivated by the Chinese case in which village leaders were at risk of being dismissed if they failed to achieve certain production targets.[3] In this context, the local politician finds it optimal to devote most of his efforts towards income generating activities. In contrast, in an election system the local politician is held accountable by villagers who decide to re-elect the village leader as long as he is able to deliver a given level of utility to villagers. Since villagers not only care about income, but also about other outcomes such as income equality or the availability of public goods, the local politician finds it optimal to transfer some effort from income generating activities to the provision of public goods. This leads to a decrease in productivity and generates a slowdown in economic growth. Moreover, if villagers' utility functions are subject to random shocks, the total level of effort that the local politician exerts in all tasks decreases upon the introduction of elections. The intuition for this result is that villagers have a noisy measure of the local politician's performance and this decreases the power of his incentives to exert effort. The more noisy are these random shocks, the smaller the increase in effort devoted to public good provision.

Our empirical strategy examines the effect of initializing elections while controlling for whether there are also open nominations, village and calendar year fixed effects. This is similar in spirit to a differences-in-differences strategy where village fixed effects control for all time invariant differences across villages and year fixed effects control for all changes over time that affect villages similarly. Our main empirical difficulty consists on the fact that elections were not randomly assigned. The introduction of elections was determined at times in a top-down fashion (provincial leaders had the mandate of introducing elections after the Organic Law of Village Committees was passed on 1987), and some other times by request of villagers. Our data show that the main driver of election timing is the income level of the poorest within a village, and thereby controlled for with village fixed effects. That said, the identification is far from an ideal experiment. We use fixed effects because it is the most transparent method and thereby easiest to use for thinking through the potential biases. Later in the paper, we discuss potential identification issues in detail and provide robustness checks for them.

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[3] See Rozelle (1994).

The empirical results show that elected village leaders were more likely to be from a rich family background and less educated than appointed leaders. These results are only present for the head of the village committee, but are absent for the party secretary. The results on economic performance are provocative. We find that elections reduce income and income growth for households on *all* parts of the income distribution. Household incomes in villages with elections grow at half of the rate as households in villages without. Interestingly, elections also decrease inequality as the largest reductions in income and growth are experienced by households at the top of the village income distribution. We find no effect on taxation or fees paid by villagers, which is consistent with the fact that the village government has extremely limited abilities to impose taxes and fees. Instead, the adoption of elections seems to have led to a redistribution of assets from village enterprises towards households. This could explain by itself the reductions in income and inequality if there were economies of scale in productive assets and richer households benefitted more from village enterprises.

The most obvious explanation for these results is that villagers value equality and are therefore willing to sacrifice some amount of economic growth in order to achieve a more equal distribution of income. The introduction of elections forces village leaders to be sensitive to these demands and to shift their efforts towards policies that favor the median voter. To further investigate this hypothesis, we investigate the effects of elections on public good provision and the enforcement of unpopular policies, such as the One Child Policy. We find that elections increase the probability of having a public primary school by 3.4% and the probability of allowing couples to have two children by 13%. Elections also reduced the number of administrators in the village government, whose salary is paid from village revenues.

These empirical findings are consistent with the predictions of the model since we estimate a clear slowdown in economic growth but an improvement in other outcomes valued by villagers, such as increase in public goods, decrease in within village inequality and relaxation of the enforcement of unpopular laws. The lower level of effort devoted to making assets productive could explain why the median household income does not increase despite controlling a higher proportion of assets. The slowdown in economic growth is stronger for the richest households because elections lead to a reduction of assets controlled by firms, which profits are mostly captured by the richest households.

This paper contributes to a number of different literatures. First, it relates to the literature on the relationship of political institutions and economic outcomes. Most of these studies have focused on the comparison of countries with different clusters of institutions.[4] There are very few within-country studies that directly analyze the effects of electoral accountability on economic outcomes and policies. Besley and Case (1995) and Daniel and Lott (1997) gauged the effect of accountability by comparing elected officials who face term limits with those who do not, while Olken (2007) compares the effect of bottom-up versus top-down accountability on corruption in Indonesia. Our paper is also compliments a recent study by Dal Bo and Rossi (2008) which studies the effect of reduced term lengths in Argentina and find that the reduction in term lengths causes elected leaders to reduce their efforts. Second, our paper contributes to the growing number of studies that examine the effects of the village electoral reforms in China.[5] Our study improves upon past studies in having much more breadth and depth of data which allows us to estimate the effects of village elections on a nationally representative sample for a larger range of economic and social outcomes. In addition to sample size, this increased scope in data allows us to investigate the mechanisms which drive the reduced form results. We also differ from previous studies in that we do not bundle elections with open nominations, which occurred several years after the fact. Finally, our paper contributes to studies of the differences in incentives and performance of appointed versus elected officials such as Besley and Coate (2003), Maskin and Tirole (2004), Alesina and Tabellini (2007, 2008), and Martinez-Bravo (2010).

The rest of the paper is organized as follows. Section two provides some background information on the Chinese rural economy and a brief overview of the nature of the electoral reforms. Section three presents a simple model that explores the consequences of the alternative accountability systems for the village chief. Section four describes the data. In section

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[4] See for instance Mauro, 1995; Hall and Jones, 1999; Acemoglu et. al., 2001; Person and Tabellini, 2003.

[5] Zhang et. al. (2004) uses a panel of 60 villages from two provinces and finds that elections have little effects on village government revenues but shift the distribution of taxation from individuals to enterprises; and that elections and power sharing are conducive to improve the allocation of public expenditures. In a different sample of 48 villages Wang and Yao (2007) finds that elections increase the share of public expenditures in the village budget, but reduce the shares of administrative costs and income handed to the township government. Shen and Yao (2008) finds that elections reduce the Gini coefficient by 0.04, or 14.3% of the sample average. Li, Xu and Yao (2006) finds that the introduction of elections makes villages more likely to establish a health care plan and household less likely to borrow by 16.7% when one of its working adults is seriously sick.

five we discuss our empirical strategies. Section six presents our main empirical results. And finally, Section seven offers the conclusions.

2.2 Village Organization and Electoral Reforms

In this section, we provide some background information and historical context of the Chinese countryside during the time frame when the electoral reforms were introduced. We first describe the governance structure of the Chinese villages and their decision making process. Next, we discuss the degree of involvement of the village leadership in economic affairs. As we discuss, village leaders play a crucial role in most economic activities, which makes the Chinese case especially suited to analyze the effects of increased accountability on economic performance. Finally, we provide a brief history of the electoral reforms and discuss the reasons of their introduction.

2.2.1 Village Governance Structure

The village government consists of two groups of leaders: the village committee and the Communist Party committee. The village committee comprises the village chief, the vice-chief and two to five other members. The electoral reforms described in this paper affected the method of selection and the accountability mechanisms of the village committee. The second group of leaders comprises of the village party members (cadres) which are led by the village party secretary, who is appointed by the county level party.

There is not a clear outline in the Chinese laws of what is the relative distribution of power between the village committee and party cadres.[6] Decisions are usually reached by consensus and both the village chief and the party secretary have decision rights over the most important issues. In Table 1 we provide some summary statistics of the distribution of signature rights between the village chief and the party secretary for the villages in our sample. As we can see, both leaders seem to have rights over the most salient issues such as land reallocation and the decision to engage in large public investments. In contrast, the village chief is usually the only one with reimbursement rights, which suggests that he is more involved with the daily executive

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[6] See Oi and Rozelle (2000) for a detailed discussion.

tasks of the village government. We do not find statistical evidence that these *de jure* decision rights were affected by the introduction of elections for the village committee.[7] However, it is very likely that an elected leader will have, *de facto*, a higher weight in the decision making process and therefore a sizeable impact on certain policy outcomes, as our empirical findings suggest.

Villages are not considered an official level of government. They are not fiscal accounting units either, and villagers pay taxes directly to upper-levels of government. Villages receive in return very few transfers from upper levels of government. According to our data, only 3.2% of total village revenue comes from upper levels of government. Village governments obtain their resources from collectively owned property and enterprises and from ad hoc fees known as *tiliu*. Village public goods and village officials' salaries must be financed from these funds.[8,9]

The village government coordinates public projects such as the construction of schools or roads. Sometimes upper levels of government contribute with some construction materials, but the village government is responsible for raising the rest of the necessary inputs, such as funding and labor, and to distribute the burden among villagers.[10] The village leadership also play an important role in the resolution of disputes and are the only source of law enforcement in the village: they have the mandate of enforcing unpopular laws such as grain procurement, collection of taxes and One Child Policy.

2.2.2 Village Economic Structure

Chinese villages exhibit some heterogeneity in their portfolio of economic activities and on the relative importance of each one. However, most villages are characterized by a high degree of involvement of village leaders in economic activities. This crucial role in the production process has been recognized by several scholars which have referred to them as "economic managers of a small, multi-dimensional business" (Rozelle, 1994).

In agriculture, village leaders control the distribution of land and productive assets, such as

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[7] Since the results are not statistically significant we do not report them in the sake of brevity.

[8] See Oi (1999) for a more detailed description of the fiscal structure of villages.

[9] Notice that this implies that villages are fiscally autonomous. Therefore, there are no fiscal spillovers that could confound the analysis of the relationship between changes in fees and the provision of public goods.

[10] Villagers are required to provide a number of obligated working days per year that are devoted to the construction of this type of public projects.

agricultural machinery. Land is collectively owned by the village and farmers are given lease rights for 15-years land contracts. However, in some villages land is regularly re-allocated among households, sometimes to transfer more land to those households that are more productive.[11] Likewise, rental arrangements between farmers need to be approved by the village chief. The village chief is also actively involved in planting and in technology adoption decisions, although the degree of involvement varies widely across villages. In some cases, village leaders determine the entire village's cropping pattern while in others they only provide incentives for the cultivation of some specific crop, such as hybrid rice. Some agricultural machinery is collectively owned by the village and their use, acquisition and distribution is decided by village leaders (Oi and Rozelle, 2000; Rozelle, 1994).

Village leaders also act as entrepreneurs, establishing and managing village enterprises. Oftentimes they are highly involved in all aspects of their functioning and village enterprises have become an important source of power for village leaders and venue for their personal enrichment. Some other times the management of the firm is delegated to a holding corporation or other type of organization which decides about the allocation of jobs and distribution of profits.

Finally, village leaders also have the possibility of obtaining outside-village opportunities that provide off-farm employment to villagers, such as jobs in township factories, contracts to perform mining, fishing, forestry and construction, among other activities.

Overall, village leaders seem to have substantial power to affect the income generating process of villages and to determine some crucial aspects such as the capital intensity of the different activities and the distribution of rents within the village. This makes the Chinese case a specially suited context to study the economic effects of changes in leaders accountability.

2.2.3 History of Electoral Reforms

The need of political reforms in the Chinese countryside was first debated by national CCP leaders in the mid 1980's, in response to the growing concern about the rapidly eroding relationship between villagers and local party cadres. In the old commune system, village leaders

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[11]This is usually in exchange of higher production quotas, i.e. household's commitment to achieve a higher production level (Rozelle, 1994).

distributed the production outcome of the collectives after cutting off the state part. Since villagers depended on them for their most basic needs, village leaders became very powerful figures in the village. Decollectivization brought a radical shift in the distribution of power: households became autonomous production units which substantially reduced cadres' leverage over households. However, cadres still had the mandate of enforcing unpopular laws, such as grain procurement, collection of taxes and fees, and One Child Policy. Oftentimes village leaders resorted to coercion, threats and violence in order to enforce these laws, and villagers responded with revenge acts, contributing to the escalating tension between villagers and party cadres. Fearing the spark of protests and generalized unrest, some national leaders started advocating for comprehensive reforms in rural political institutions, in particular for the introduction of elections for the village committee.

Proponents of the reforms used a variety of arguments. They claimed that village elections would lead to a higher compliance with unpopular policies: elected leaders would have more legitimacy to enforce these laws and would be more sensitive to villagers' demands to distribute the burden of these policies more fairly among villagers (O'Brien 1994, Kelliher 1997, Li and O'Brien 1999). They also argued that the shift in accountability to villagers would impose checks on cadres, which was necessary because top-down supervision was insufficient.[12] Proponents also claimed that reforms would contribute to the selection of better village leadership, since villagers would vote for competent candidates and unseat corrupt incumbents (Kelliher 1997).[13,14]

The *Organic Law on Village Committees* (OLVC) was finally approved in 1987 and established the democratically elected village committee as the governing body of the village. The entire adult population obtained the right to vote for the village committee and unlike the

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[12] Peng Zhen, chairman of the NPC Standing Committee and a strong supporter of granting democratic rights to villagers, said "Who supervises rural cadres? Can we supervise them? No, not even if we had 48 hours a day." (Peng Zhen's speech at the chairmanship meeting of the Standing Committee of the Sixth NPC, April 6, 1987. Cited in Li and O'Brien 1999).

[13] Kelliher also argues that, as an afterthought, some CCP leaders advocated for the introduction of village elections because they made a "superb propaganda abroad". The Ministry of Home Affairs arranged several visits for foreigners to show them the advances of self-government in rural areas with the objective of improving China's international public opinion and the legitimacy of the CCP government.

[14] There was also opposition to the law both at the national level and especially among township and county officials who fear losing control over village leaders. However, the support of certain national leaders such as Peng Zhen and Bo Yibo and the villagers' demand for village elections were decisive for the implementation of the electoral reforms. See Li and O'Brien (1999).

previous Maoist period the number of candidates was required to exceed the number of seats. During the first part of the reform candidates were typically nominated by the village, county and township level party branches. The next phase of the reform occurred in 1998, when the OLVC was revised and reinforced to specifically address the importance of open nominations also known as *haixuan*. The revised law required that villagers were able to nominate candidates for the election.

Despite the OLVC was passed in 1987, several villages held competitive elections before that date. As our data shows, elections occurred as early as 1983. Similar to other Post-Mao reforms, elections spread slowly across China. Provincial governments were given a large window of time to ensure that their villages complied. By 1998, the Ministry of Civil Affairs (MoCA) reported that over half of the villages had conducted competitive elections with more candidates than posts, and more than 70% had at least some kind of elections.

2.3 Model

In this section we develop a model to explore through which mechanism the introduction of village elections can lead to a slowdown in economic growth. As an starting point, we take as given the focus in economic growth by the CCP as the main way to evaluate the performance of village leaders prior to the implementation of the electoral reforms. Then, we analyze how the optimal allocation of effort of village leaders is affected by the change in accountability produced by the introduction of village elections.

2.3.1 Set-Up

Consider an economy populated by a continuum of identical villagers of mass one. In this economy there is also a local leader that takes certain decisions that affect the level of productivity and the provision of public goods. Both types of actors live for two periods and have quasilinear preferences over income y and public goods g. Utility functions of villagers and the leader are

defined as follows

$$U^V(y,g) = y + f(g) + \varepsilon$$
$$U^L(y,g) = \alpha y + f(g) + \varepsilon$$

where the subscript V stands for villagers and L for leader, and $\alpha \geq 1$ is a parameter that captures the preference of the leader for village income. Since village leaders pay their salaries out of agricultural output and village enterprises,[15] it is likely that they have a stronger preference for income than villagers.[16] ε is a normal random variable with mean 0 and variance σ_ε^2, which captures all the other issues that affect villagers' level of utility and that are not under the leader's control. Let us denote by R, the value of being in office for a second period and for simplicity we assume it is the same under the appointment and election regimes.

The local leader can affect the level of income generated in the village and the level of public goods by exerting costly effort. Let e_y denote the leader's effort to generate income and e_g the leader's effort in public goods provision. The following expressions capture the production functions of income and public goods

$$y = e_y + \epsilon \tag{2.1}$$

$$g = e_g \tag{2.2}$$

where ϵ is a random variable normally distributed with mean 0, and variance σ_ϵ^2 and cumulative density function $\Phi(\cdot)$. ϵ represents all unforeseen economic shocks that affect the village. The specification that village leaders can affect the level of income is highly plausible for the Chinese context. As we discussed in the previous section, one of the legacies from the collectivization period is the active involvement of village leaders in several aspects of the production process. Through the management of land and productive assets, village leaders have several ways of affecting the overall level of productivity in the village economy. We assume that leader's effort is costly, with total cost captured by the cost function $C(e_y + e_g)$ where $C(\cdot)$ is increasing and

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[15]See Oi and Rozelle (1999) and Boisvert (1992).

[16]Alternatively, we can also interpret the leader's utility function as a weighted sum of the villagers' income (capturing leader's salary) and the level of utility of villagers, i.e. $U^L(y,g) = (\alpha - 1)y + U^V(y,g)$.

convex, and satisfies $C'(0) = 0$.

The leader is able to remain in office for a second term as long as he provides enough utility to the group that holds him accountable. In the appointment regime, the CCP has decision rights over his continuity as village leader and only reappoints him if he achieves a target income level. This specification is motivated by the Chinese case in which village leaders were required to attain certain village production target in order to keep their positions (Rozelle, 1994).[17] In the electoral regime, the leader gets re-elected if he is able to provide a certain level of utility to villagers.[18] We now turn to analyze the optimal allocation of effort in each regime.

2.3.2 Appointment System

In an appointment system, the village leader chooses effort levels to maximize his expected utility:

$$\max_{e_y, e_g} E\{U^L(y, g)\} + \Pr[y_1 > \bar{y}]R - C(e_y + e_g)$$

By using production function functions (2.1) and (2.2), and the probability distribution of the random shock, the above expression can be rewritten as

$$\max_{e_y, e_g} E\{\alpha(e_y + \epsilon) + f(e_g) + \varepsilon\} + [1 - \Phi(\bar{y} - e_y)]R - C(e_y + e_g)$$

which yields the following first order conditions

$$\alpha + \phi(\bar{y} - e_y)R = C'(e_y + e_g)$$
$$f'(e_g) = C'(e_y + e_g)$$

Notice that in order to extract the maximum level of effort, the CCP has to set the reappointment threshold to be $\bar{y} = e_y^{ap}$, where e_y^{ap} denotes the equilibrium level of effort in economic activities under the appointment regime. Incorporating this rule in the first order conditions we obtain the following two expressions which implicitly define the optimal levels of effort in

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[17] In particular, Rozelle describes how failing to meet targets in agricultural production was the only way in which village leaders could lose their job.

[18] Therefore we model the electoral competition as a retrospective voting model as Barro (1973), or Ferejohn (1986).

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economic activities, e_y^{ap}, and public goods, e_g^{ap}.

$$\alpha + \frac{R}{\sigma_\epsilon\sqrt{2\pi}} = C'(e_y^{ap} + e_g^{ap}) \tag{2.3}$$

$$f'(e_g^{ap}) = C'(e_y^{ap} + e_g^{ap}) \tag{2.4}$$

2.3.3 Election System

Similarly, in an election regime the village leader chooses effort levels to maximize his expected utility:

$$\max_{e_y, e_g} E\{U^L(y, g)\} + \Pr[U^V(y, g) > \bar{U}]R - C(e_y + e_g)$$

Let $\Gamma(\cdot)$ denote the cumulative density function and $\gamma(\cdot)$ the probability density function of a normal distribution with mean 0 and variance $\sigma_\epsilon^2 + \sigma_\varepsilon^2$. By using the production functions (2.1) and (2.2), the above expression can be rewritten as

$$\max_{e_y, e_g} E\{\alpha(e_y + \epsilon) + f(e_g) + \varepsilon\} + [1 - \Gamma(\bar{U} - e_y - f(e_g))]R - C(e_y + e_g)$$

The first order conditions are

$$\alpha + \gamma(\bar{U} - e_y - f(e_g))R = C'(e_y + e_g)$$

$$f'(e_g) + f'(e_g)\gamma(\bar{U} - e_y - f(e_g))R = C'(e_y + e_g)$$

In order to extract the maximum effort from the leader, citizens have to set the reelection threshold to be $\bar{U} = e_y^{el} + f(e_g^{el})$, where e_y^{el} and e_g^{el} are the equilibrium levels of effort in economic activities and public goods, respectively, under the elections regime. Incorporating this rule in the first order conditions, we obtain the following two expressions which implicitly define the optimal levels of effort e_y^{el} and e_g^{el}.

$$\alpha + \frac{R}{\sqrt{\sigma_\epsilon^2 + \sigma_\varepsilon^2}\sqrt{2\pi}} = C'(e_y^{el} + e_g^{el}) \tag{2.5}$$

$$f'(e_g^{el}) + f'(e_g^{el})\frac{R}{\sqrt{\sigma_\epsilon^2 + \sigma_\varepsilon^2}\sqrt{2\pi}} = C'(e_y^{el} + e_g^{el}) \tag{2.6}$$

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2.3.4 Comparison Election versus Appointment System

By comparing the equilibrium effort levels in each type of regime we obtain the following results.

Proposition 1 (Effort Transfer) *If $\sigma_\varepsilon^2 = 0$, we have that*

1. $e_y^{el} + e_g^{el} = e_y^{ap} + e_g^{ap}$

2. $e_g^{el} > e_g^{ap}$

3. $e_y^{el} < e_y^{ap}$

Proof. Point 1 follows from comparing (2.3) with (2.5), and point 2 follows from comparing (2.4) with (2.6). Point 3 is an immediate corollary of the previous two points.

Proposition 1 indicates that in the absence of noise in villagers' preferences, the total level of effort exerted by the village leader is the same under both regimes. However, the effort devoted to public good, is higher in the election system than in the appointment system whereas the effort devoted to income growth is lower. In other words, the introduction of elections leads to a transfer of effort from income generating activities to public good provision, which is a consequence of the changes in the preferences of the groups that hold the village leader accountable.

Notice that these results are independent of α. However, if we rewrite (2.3) and (2.4) we get

$$f'(e_g^{ap}) = \alpha + \frac{R}{\sigma_\epsilon \sqrt{2\pi}} \tag{2.7}$$

which shows that the level of effort in public goods, e_g^{ap}, is decreasing in α and R, and increasing in σ_ϵ.

Let us now examine the case in which villagers' preferences are subject to random shocks.

Proposition 2 (Effort Reduction) *If $\sigma_\varepsilon^2 > 0$, we have that*

1. $e_y^{el} + e_g^{el} < e_y^{ap} + e_g^{ap}$

2. $e_y^{el} < e_y^{ap}$

3. $e_g^{el} > e_g^{ap}$

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4. e_g^{el} is decreasing in σ_ε^2 if $\alpha > 1$ and independent of σ_ε^2 if $\alpha = 1$

Proof. Again, point 1 follows from comparing (2.3) with (2.5). Points 3 and 4 follow from rewriting (2.5) and (2.6) into

$$f'(e_g^{el}) = \frac{\alpha + \frac{R}{\sqrt{\sigma_\epsilon^2 + \sigma_\varepsilon^2}\sqrt{2\pi}}}{1 + \frac{R}{\sqrt{\sigma_\epsilon^2 + \sigma_\varepsilon^2}\sqrt{2\pi}}} \tag{2.8}$$

and comparing expression (2.7) to (2.8). Point 2 is an immediate corollary of the other three.

Proposition 2 leads to some additional insights. First, whenever villagers' preferences are subject to random shocks the total amount of effort that the village leader exerts is lower in the election regime than in the appointment regime. Since village leaders are evaluated on the basis of the utility they are able to deliver to villagers, the higher the variance of the shocks, the more noisy is their evaluation, which leads to a decrease in their incentives to exert effort. Similarly, notice that the effort devoted to public good provision is also decreasing in the variance of the noise and decreasing in the α (because current income becomes more important for the village leader).

2.3.5 Summary of Empirical Predictions

To sum up, this model leads to the following empirical predictions regarding the change in accountability from an appointment system to an elected system.

1. Effort devoted to income generating activities decreases.

2. Effort devoted to public good provision increases.

    (a) This increase will be smaller, the higher is the variance in random shocks of villagers preferences, σ_ε^2, and the smaller is the village leader preference for income, α.[19]

In Section 5, we discuss our empirical results and explain how they are to a great extent consistent with these empirical predictions.

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[19]To see the latter effect this compare (2.7) to (2.8).

2.4 Data

2.4.1 Data Sources

This study uses data from two sources. The first dataset is a unique retrospective survey of the political reform histories of 266 villages from 1980-2005 collected by the authors. The survey was conducted in the following way: present and former village leaders met in a local school room and together filled out a questionnaire on a variety of questions. They were asked about the years when elections and *haixuan* were first implemented in the village, the years when subsequent elections were held, the number of candidates for each election, personal characteristics of each village leader and the powers of each office.[20] Most villages were able to retrieve village records for documentation, but in general recalling these data was not a problem since these were major events in the village context. Throughout the survey, professional surveyors were present to help village leaders and to verify the accuracy of their answers. The sample of villages was chosen to match our second source of data: the National Fixed-Point Survey (NFS).

The NFS is collected and maintained by the Research Center for Rural Economy (RCRE), a research division of the Chinese Ministry of Agriculture. It is a longitudinal survey of about 320 villages and 24,000 households distributed across all continental Chinese provinces. The NFS was first conducted in the mid-1980s and villages were chosen to be nationally representative at that time.[21,22] Figure 1 maps the counties for which we have NFS data. For this study, we use about 30% of the variables from their village-level data[23] for 26 provinces for all of the available

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[20] For personal characteristics of the village chief, the village party secretary and the village accountant, we asked for age, sex, level of education, whether he/she belonged to a family that owned land before the communist land reforms in the early 1950s, whether he/she was persecuted during the Cultural Revolution, *pidou*. For powers, we asked them whether the village chief, secretary or accountant's signature was necessary for employing village personnel, or spending money from village funds. We also ask the villagers to recall the method of the election (e.g. anonymous ballot). Additional documentation for this data can be found at

http://www.econ.yale.edu/~nq3/NANCYS_Yale_Website/Surveys.html

[21] The villages in the study were selected through a stratified sampling approach: for each province, a number of counties were randomly selected, and then a number of villages were randomly selected within those counties. 7 to 90 households were then randomly selected from each village in the survey. According to the RCRE, there has been no attrition, except in the cases of administrative mergers at the village level and deaths at the household level.

[22] Consequently, by 2005 this sample may no longer be nationally representative. This should be taken into account when interpreting our results.

[23] The RCRE village-level survey contains eight sections: 1) population, households, and local organizations; 2) the labor force; 3) land; 4) fixed-capital assets; 5) agricultural production and sales; 6) total income and expenses; 7) village fiscal revenues and expenditures; and 8) other social indicators (e.g., crime, religious participation, etc.).

years, 1987-2005. We do not use data for earlier years of the survey because changes in survey techniques made the data difficult to compare over time. Within the 26 provinces, we use all 266 villages in the NFS.[24]

There are several key advantages of this dataset. First, the RCRE panel data is reported contemporaneously. This avoids measurement error that would emerge if we were to collect recall data on income and inequality. Second, the panel structure of the survey allows us to include village fixed effects in our econometric specification, which control for all time invariant unobserved characteristics of the village. Third, the long time horizon allows us to examine long-run outcomes. Finally, the richness of the RCRE data enables us to explore the mechanisms that underlie our reduced form effects.

We merge our survey data to the NFS data at the village and year level. Forty-nine villages are dropped because of data entry mistakes. Our final sample comprise of 217 villages. The political data span 1980-2005 and the economic and social data from the NFS span 1987-2005, except for 1992 and 1994 when the NFS was not conducted. In addition to the village-level data, we obtained yearly household-level data on gross and net incomes. We use this to calculate mean income and Gini coefficients, as well as the incomes on different parts of the village income distribution. Comparisons of the net and gross incomes also allow us to compute the overall tax burden of households.

2.4.2 Descriptive Statistics

Figure 2 summarizes the timing of the implementation of the electoral reforms by showing the number of villages that adopt elections or *haixuan* each year. As we can see, most villages implemented elections during the late 1980s and the first *haixuan* during the early 2000s. By 2005, all 217 villages in our sample had implemented elections and 132 of them had held election with open nominations. On average, the first haixuan follows the first election by approximately nine years.

In Table 2 we provide the descriptive statistics. Panel A shows the demographic composition of the villages. On average, there are 420 households per village. Each household has approxi-

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[24]Samples from four provinces of the NFS have been used in studies by Benjamin et al. (2005), de Brauw and Giles (2006), Giles (2005), Giles and Yoo (2006) and Shen and Yao (2008).

mately one young child and two working-age adults (laborers). Approximately 20% of villagers are high school graduates and 85% of them have primary education. Only 50% of households are engaged exclusively in agriculture, indicating that industry and other non-agricultural activities are an important component of households income.

Panel B displays the summary of income and inequality measures. Gross income, as reported by NFS, includes earnings from all sources including remittance payments from household members that have migrated away. Net income is net of taxes and fees paid out. On average, mean village income is growing at an annual rate of 13%.[25] The average household at the 10th percentile of the income distribution in each village is making approximately 3,044 RMB. This represents approximately 45% of the median income (6,853 RMB). The median income is approximately 53% of the top 90th percentile income (14,157 RMB). We calculate total taxes paid by households as the difference between gross and net incomes divided by gross income. This includes taxes paid to the central government (collected by the village government) and fees paid to the village government for village expenditures. Households on average pay 36% of their gross income as taxes.

Panel C shows some village-level characteristics. Approximately 88% of villages have a primary school and 15% of them have a middle school. 68% of the productive assets in the village are owned by households, 28% are owned by collectives or cooperatives and 4% are owned by firms. The village committee has on average five members (including the village chief), and the party committee has four members (including the party secretary). The village chief is on average 42 years of age, has nine years of education (equivalent to a middle school graduate), and is in office for seven years. Approximately 20% of village chiefs belong to families that owned land before the 1950's land reforms.

Table A2 in the Appendix contains additional information about the sources of village government revenue and the allocation of expenditures.[26] Similarly, Table A3 provides information about composition of village assets, disaggregated by type of ownership.

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[25] Inflation is extremely low during this period in China so we report all income in nominal terms.

[26] On average, village governments have revenues of approximately 490,677 RMB. The majority of revenues, approximately 55%, come from collective production, and approximately 21% of this comes from households. A similar proportion come from other sources. Expenditures are on average 470,056 RMB. The biggest expenditure is on collective production. Approximately 10% is delivered to upper levels of government in the form of levies and taxes. And 7% is spent on village administrative expenditures, which mostly comprises of salaries to the village government personnel (e.g. administrative and party committees and accountant).

2.5 Empirical Strategy

In this section we discuss the empirical strategies we use to evaluate the effects of the introduction of village elections.

Our main empirical specification consists in a differences-in-differences analysis in which all differences between villages that do not change over time are controlled for by the between-village comparison, and all changes over time that do not differ across villages are controlled for by the across-year comparison. In particular, we estimate the following regression

$$Y_{vt} = \beta post\_election_{vt} + \theta post\_haix_{vt} + \gamma_v + \rho_t + \varepsilon_{vt} \qquad (2.9)$$

where Y_{vt} is our outcome of interest in village v year t, $post\_election_{vt}$ is a dummy that takes value one for all the years after village v implemented its first election, $post\_haix_{vt}$ takes value one for all the years after village v implemented its first $haixuan$, and γ_v and ρ_t are village and year fixed effects, respectively. The main coefficient of interest is β, which captures the effect of elections. Coefficient θ is the additional effect that $haixuan$ had over elections, since $post\_haix_{vt}$ is the interaction of having elections and $haixuan$.

The main caveat for interpreting the estimates as causal is that the timing of the reforms is potentially endogenous to unobserved characteristics that are correlated with the outcomes of interest. For example, if villages that experience high income growth implement elections earlier, a simple fixed effects estimation will overestimate the negative effect of elections on income growth. In order to address these concerns, we undertake a number of robustness checks.

First, we investigate what are the determinants of the adoption of elections. In particular, in the cross-section of villages in our sample, we regress the year in which the first election was held against several village characteristics, such as village population, Gini coefficient, growth rate of the Gini coefficient, level of income of the 10th, 50th and 90th percentiles, and their corresponding growth rates.[27] The results are displayed in Table 3. As we can see, most regressors are not statistically significant and only the level of income of the 50th and

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[27]The regressors are the average of the mentioned variables for all the years previous to the introduction of elections.

90th percentiles seems significantly correlated to the timing of the election. However, these characteristics are controlled for in our main regression specification by the village fixed effects.

Second, we incorporate *province* × *year* fixed effects in order to further control for time varying factors that affect in the same way all villages in a given province. Our results are largely unaffected by the inclusion of these additional controls and we do not report them in this paper in the sake of brevity.

Finally, we conduct an analysis similar to the differences-in-differences specification, but letting the coefficients for the effects of the reform to vary for years since the election. In particular, we estimate the following regression

$$Y_{vt} = \sum_{\tau=-3}^{T} \beta_\tau yrs\_to\_reform_{v\tau} + \gamma_v + \rho_t + \varepsilon_{vt} \tag{2.10}$$

where Y_{vt} is the outcome in village v in year t, $yrs\_to\_reform_{v\tau}$ takes value 1 in the τ-th year since elections were introduced in village v, and γ_v and ρ_t are village and year fixed effects, respectively. Therefore, β_τ is the effect if the reform τ years since the reform. The reference group comprises of observations for four or more years before the first reform. T is the maximum number of years after the first election for any village in our sample. To control for serial correlation of the residuals within villages, we cluster the standard errors at the village level. If the reform had an effect, then β_τ should be constant for the years before the reform ($\tau < 0$), indicating there are no pre-trends in our outcome of interest prior to the introduction of elections. For the periods after the reforms we should observe effects β_τ different from zero after the reform ($\tau \geq 0$). The identification relies on a break in the trend of outcomes at the time when elections are introduced.

2.6 Results

In this section we describe our main results on the effects of the introduction of elections and *haixuan* had for a number of outcomes.

2.6.1 The Effects of Elections on Leadership Characteristics

In order to assess whether the electoral reforms were successfully implemented, we first explore their impact on village leadership characteristics by estimating equation (2.9). The results are displayed in Table 4. Two different leadership characteristics are examined, leader's family background (defined as whether the leader belongs to a middle-rich family which owned land prior to the 1950s land reforms) and the leader's years of education. As we can see, the introduction of elections led to changes in the type of leaders in the position of village chief but did not affect the party secretary position. This suggests that elections had a real impact in the village governance since they led to changes in the composition of the village committee, which was the object of the reforms, but not in the party committee.

2.6.2 The Effects of Elections on Income and Economic Growth

We next explore the effect of elections in income levels and economic growth. Table 5 displays the main results. Columns (1) and (2) indicate that elections lead to a decrease gross income of 9.3% and of net income of 8.7%.[28] Columns (3) and (4) explore the effects on the annual growth rate of gross and net income, respectively. These regressions also include income levels lagged one and two periods as regressors. The results indicate that economic growth is approximately 5 percentage points lower once elections are introduced (both in terms of gross and net income).

These results are consistent with the predictions of the model described above which relates this slowdown in economic growth to a change in the incentives that the village chief faced. The introduction of elections shifted the accountability from upper levels of government towards villagers. The village chief was no longer evaluated only based on economic performance, but on the basis of multiple objectives that villagers valued. This led to a translation of village chief's effort from income generating activities to the provision of public goods and other outcomes valued by villagers. As a result, the level of productivity decreased, generating a slowdown in economic growth.

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[28]Notice that this decrease in income is by comparison of villages that hold elections relative that those that do not. During the relevant period nominal incomes are growing at a 13% annual rate, so we should interpret our results as a slowdown in economic growth once elections are adopted, but incomes continue to raise throughout this period.

2.6.3 The Effects on Social Outcomes and Inequality

In order to further investigate the implications of the model, we estimate the effect of the introduction of village elections on public goods and other outcomes that villagers value. The main results are displayed in Table 6.

Column (1) shows that elections increase the probability of having a primary school by 3.4%. This result is not surprising since schools are one of the public goods provided by the village that villagers value the most. As we discussed above, the village chief plays a crucial role in coordinating villagers efforts and revenue raising for large public investment projects. Column (2) shows that elections decrease the number of village administratives from around five to four people per village. This substantial decrease in the number of employed personnel suggest that villagers have a preference for reducing the number of bureaucrats in order to reallocate the costs of their salaries to alternative uses. Columns (3) and (4) examine the effects on enforcement of unpopular policies and suggest that elections lead to a relaxation of the One Child Policy. Elections increase the probability that households are allowed to have a second child by 7%. This result is particularly strong if the first child was a girl, in which case households are 13% more likely to be allowed to have a second child once elections are introduced. This result is significant at the 1% level.

Finally, we estimate that the introduction of elections leads to a reduction in within village inequality. Columns (5) and (6) show that elections reduce the Gini coefficient by approximately 0.01 points, both in terms of gross and net incomes. Notice that, the magnitude of the reduction is similar for gross and net incomes. This suggests that income redistribution through taxation and transfers is insufficient to explain this decrease in inequality. As we discuss in the next subsection, we find evidence that this is indeed the case. In Panel B, columns (8) and (10) show that in RMB terms, elections reduce the gross income distance between the 10th and 90th percentiles by 5,845 RMB, and between the 50th and 90th percentiles by 5,053 RMB. In terms of ratios, columns (7) and (9) show that elections increase the ratio of 10th to 90th percentile incomes by 1.5 percentage points and the ratio of 50th to 90th percentile incomes by 2.2 percentage points.[29] These estimates are statistically significant at the 5% and 10% levels.

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[29]In columns (11) and (12) we report the effects of elections on net income ratios (10th to the 90th percentile and 50th to the 90th percentile). The other inequality results in terms of net income are very similar to those of

The estimates for *haixuan* are smaller in magnitude and typically not statistically significant, which suggests that open nominations did not have additional effects to elections.

We also estimate the yearly effect of elections on the difference in income between the 10th and top 90th percentile households; and between the median and 90th percentile households. The regression results for the latter outcome are reported in the Appendix Table A1. The estimated coefficients for the vector of $\hat{\beta}s$ from equation (2.10) are plotted in Figures 3A and 3B. The figures show that there is a clear trend break at the time of the first election and no evidence of a pre-trend. Notice that the positive coefficients for the years after the first election mean that elections reduce the gap between the two percentiles of the income distribution. The finding that the magnitude of the coefficients increase over time suggests that inequality continues to be further reduced in the years following the first election.

In Panel C we explore whether this reduction in within village inequality is related to the general slowdown in economic growth that we find in Table 5. In particular, we estimate the effects of the electoral reforms on income levels of different deciles of the village income distribution. Columns (13) to (18) reveal that all income deciles suffer reductions in income levels, both in net and gross terms. However, this effect is larger for richer households with those in the 50th and 90th percentiles experiencing reductions in gross income by 4.3% and 10%, respectively. These estimates are statistically significant at the 10% and 1% level. Households in the 90th percentile also experienced a decline of net income of 6.9%, (significant at the 10% level).

Overall, these results suggest that the introduction of village elections led to an improvement of several outcomes that villagers valued, such as the number of primary schools, relaxation of unpopular policies and reduction in within village inequality. These findings are consistent with the model which predicts that the change in accountability leads to an increase the village leader's effort in the provision of public goods and other outcomes that villagers value.

2.6.4 The Effects on Taxation and Asset Redistribution

In this subsection we explore what are the mechanisms that could lead to a decrease in within village inequality and income. First, we do not expect to find evidence that the reduction

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gross income and they are ommitted in the sake of brevity.

of inequality is driven by income redistribution through taxation and transfers, for mainly to reasons. On the one hand, our results point out that the reduction of inequality not only was in terms of net income, but also in terms of gross income. On the other hand, village leaders have very limited power to affect the taxation burden of households. Villagers pay taxes directly to upper levels of government and village leaders have no power whatsoever to establish tax rates. The village government used to raise some revenue from ad-hoc fees (known as *tiliu*) but this practice was made illegal by the *Tax and Fee Reform* in 2003.[30] In order to verify this, we investigate in Table 7, Panel A, the effects of elections on the sources of revenue of the village government. None of the results is statistically significant at the 10% level, which suggests that there were not major changes in the way the village government raised its revenue.

In addition to this, we study whether the overall taxation burden of households, computed by the difference between gross and net income as a fraction of total gross income, was affected by the introduction of elections. This measure has the benefit that does not rely on accurate reporting of taxes and fees revenue of the village government (which could potentially be systematically under-reported after fees were nominally abolished). For this exercise, we estimate the effect of elections on the income of the mean household of each village-year, and also for the mean households with gross incomes below the 25th percentile of the village income distribution, between the 25th and the 50th, the 50th and 75th, and above the 75th. The results are shown in the Appendix Table A4. There is no evidence that elections affected the overall tax burden of households. The estimates are all small in magnitude and statistically insignificant. Therefore, we conclude that the reduction in inequality is not due to redistributive tax policies.

We next explore whether there have been changes in the distribution of productive assets. As we discussed in Section 2.2, village leaders are actively involved in the acquisition and distribution of productive assets such as agricultural machinery and other capital goods. Therefore, it is plausible that newly elected village leaders have affected the income generating process of the village by altering the asset distribution. As we can see from Table 7 Panel B this seems to be the case. In particular, we observe from columns (8) and (11) that the introduction of elections led to an increase of 20% in the value of assets owned by households which represents

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[30]Nevertheless, anecdotal evidence suggests that their collection was continued in practice in some parts of China.

an increase of 4 percentage points of the share of assets owned by household in the village. This was at the expense of collectives and firms which experienced a decrease in the level and the proportion of assets under their control.

The findings on asset redistribution can explain both the reduction in income and inequality. Elected village leaders might have been pressured by their constituents to redistribute assets in order to ensure a more equitable distribution of their profits. This redistribution might have decreased the overall output if there were economies of scale that required asset concentration to achieve its maximum marginal product. Alternatively, the lower level of effort that an elected village head devotes to making assets productive could explain why the median household income does not increase despite controlling a higher proportion of assets.

The lack of ability of village heads to redistribute income through taxation and transfers, can explain why this inefficient form of redistribution emerges. Similarly, it is very likely that villagers do not have the ability to establish compensating transfers because once the ownership of an asset is established, the owner lacks commitment to redistribute ex-post his or her gains.

2.6.5   Robustness Checks

One concern for the interpretation of the results on income and inequality is that the introduction of elections might have affected the propensity of households to under-report income. If for instance, households expected that progressive taxation would follow the introduction of elections, they might have had incentives to under-report income proportional to their income level. If this is the case, then we will not be able to distinguish whether elections decreased inequality or if simply increased proportional under-reporting. To address this possibility, we investigate the effects of elections on household consumption, which is more difficult to under-report. If elections have no effect on consumption, then it would be hard to believe that the decrease in income is completely genuine. However, if consumption also decreases, and decreases more for richer households, then the possibility that elections lead to changes in the propensity to under-report income would be unlikely. Appendix Table A5 shows the effect of elections on income and consumption across the income distribution for a subsample of 48 villages.[31] As we can see, consumption decreases by more than income for households in all parts of the in-

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[31] We only have data on consumption at the household level, for a subsample of 48 villages.

come distribution. In fact, the relative effect for households in the top quartile to households in the second quartiles is the same for the two outcomes. On average, elections reduced the incomes and consumption expenditures of the average households in the top quartile of the village income distribution by twice as much as the household in the second quartile. These results are very suggestive that the reduction income from elections is not likely to be driven by under-reporting.

2.7 Conclusion

The introduction of elections in rural China is constitutes an unprecedented opportunity to evaluate the impact of increased accountability on economic performance. The controlled nature of these reforms (in the sense that many other institutions were held constant) and the high degree of involvement of village leaders in economic affairs, makes the Chinese case specially suited to study the subject.

The results of this study are provocative. We find that elections decreased income and income growth for households in *all* sections of the income distribution. At the same time election decreased within village income inequality, increased public goods provision, and relaxed the enforcement of unpopular policies. Interestingly, our findings suggest that the inability to redistribute through taxation causes the village government to resort to a redistribution of assets. In particular, assets were redistributed away from firms and collectives and towards households.

The fact that income growth is halved by elections suggest that villagers place great value on public goods and reduction of inequality that they receive in return. Future work will include a more in-depth analysis of the trade-offs of asset redistribution as a way to reduce inequality versus taxation. It is very likely that the large reduction in growth would not be necessary if leaders were allowed to impose a progressive form of taxation.

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2.8   Figures

Figure 1: Map of the Counties where NFS Villages are Located.
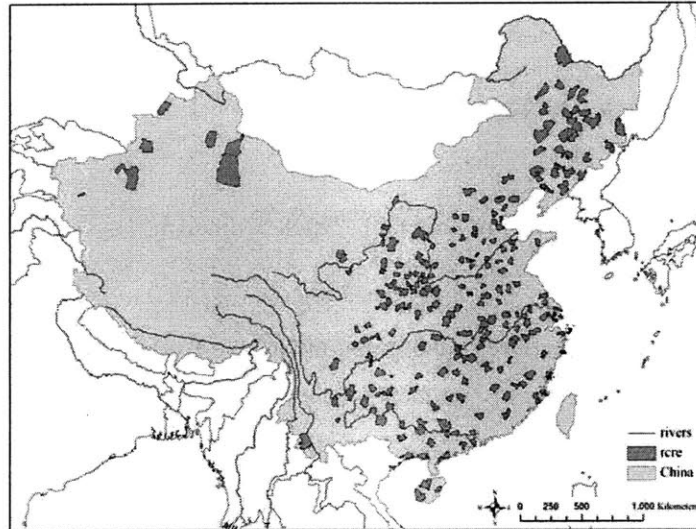
Figure 2. Timing of Electoral Reforms
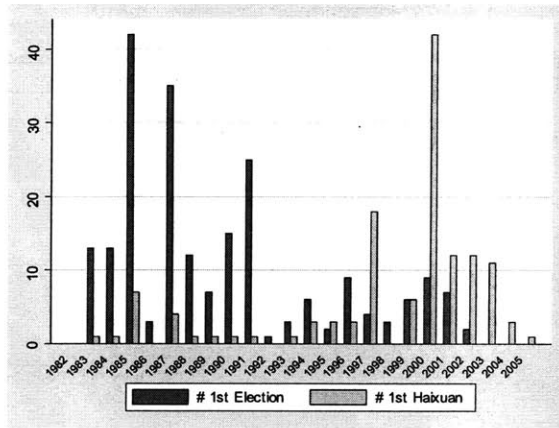
This figure displays the number of villages in our sample
which held their first election or haixuan in each year.

Figure 3. Effects of Elections on Inequality

Panel A

income 10th percentile - income 90th percentile

Panel B

income 50th percentile - income 90th percentile
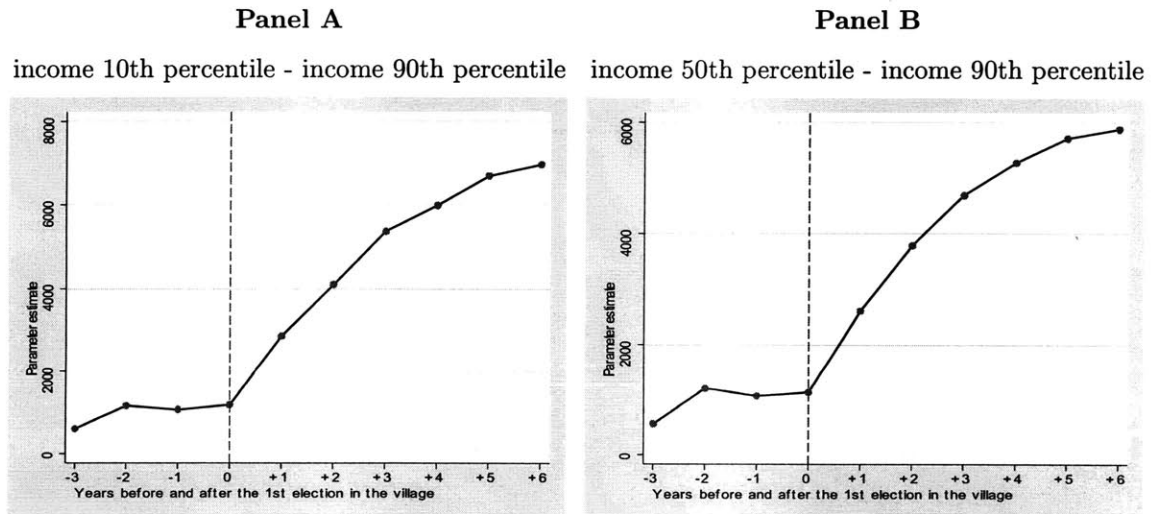
Coefficients of the dummy variables for the number of years before and after the first election in the village,
controlling for village and calendar year fixed effects.

Table 1. Distribution of Powers in the Village

Signature Rights	Mean	Standard Deviation
Appoint managers of village enterprises:		
Village Chief	0.3225	0.4675
Party Secretary	0.3073	0.4614
Village Chief & Party Secretary	0.3684	0.4824
Employ village government public employees:		
Village Chief	0.2661	0.4420
Party Secretary	0.2944	0.4558
Village Chief & Party Secretary	0.4392	0.4963
Reimbursement:		
Village Chief	0.5582	0.4966
Party Secretary	0.2485	0.4322
Village Chief & Party Secretary	0.1931	0.3948
Reallocate Land:		
Village Chief	0.3285	0.4697
Party Secretary	0.1347	0.3414
Village Chief & Party Secretary	0.5305	0.4991
Large Public Investment:		
Village Chief	0.1770	0.3817
Party Secretary	0.1497	0.3568
Village Chief & Party Secretary	0.6731	0.4691

Table 2: Descriptive Statistics

	Mean	Standard Deviation
A. Villagers Characteristics		
Number of HH	419.7692	279.7648
# children between 7-13 years old per HH	0.7723	11.2886
# of laborers per HH	2.0346	0.4219
% of Primary Graduates	0.8523	0.6655
% of High School Graduates	0.2145	0.2313
% of HH Full-time Farming	49.4837	32.4397
B. Income		
Mean annual growth (gross income)	0.1299	0.2524
10th Percentile Net Income	3043.9040	2579.8580
50th Percentile Net Income	6853.8430	5829.3120
90th Percentile Net Income	14156.9300	17517.9700
Ratio of 10th/90th Net Income	0.2512	0.1137
Ratio of 10th/50th Net Income	0.4587	0.2145
Ratio of 50th/90th Net Income	0.5303	0.1116
HH Taxes (Gross-net/Gross)	0.3611	0.1477
C. Village Characteristics & Village Government		
% of villages with primary school	0.8846	0.3196
% of villages with middle school	0.1551	0.3620
% of assets owned by households	0.6772	0.2981
% of assets owned collectively	0.2772	0.2973
% of assets owned by firms	0.0476	0.1321
Number of Administrative Committee	5.4916	3.2263
Number of Party Committee	4.3653	2.3603
Age of Village Chief	42.3745	7.8153
Years of Education of Village Chief	9.0888	2.3334
Tenure of Village Chief (years in office)	7.2900	4.8587
Village Chief from Land-owning Family	0.2045	0.4034

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Table 3. Determinants of Timing of Elections

	(1) Year of Election
Pre Gini	-0.254
	(6.548)
Pre Gini Growth	-4.602
	(13.66)
Pre 10th Inc	-0.000771
	(0.000848)
Pre 10th Inc Growth	-4.099
	(4.373)
Pre 50th Inc	0.00202***
	(0.000563)
Pre 50th Inc Growth	-1.022
	(7.627)
Pre 90th Inc	-0.000256***
	(6.80e-05)
Pre 90th Inc Growth	0.634
	(4.739)
Village Population	-0.0440
	(0.609)
R-squared	0.774

The regression includes Province Fixed Effects

Table 4. Leadership Characteristics

	Dependent Variables			
	(1) Family VC	(2) Family PS	(3) Education VC	(4) Education PS
Sample Mean	0.204	0.172	9.089	9.029
Election	0.1262**	0.0499	-1.3641***	-0.1172
	(0.0613)	(0.0364)	(0.4861)	(0.2287)
Haixuan	0.0141	0.0400	0.3624	0.0790
	(0.0335)	(0.0316)	(0.2487)	(0.2004)
Observations	3878	4497	3896	4521
F-test diff coeff (stat)	2.533	0.0410	9.463	0.416
F-test diff coeff (p-value)	0.113	0.840	0.00237	0.519

All regressions include village and year fixed effects.

Standard Errors are clustered at the village level

Table 5: Effects of Elections on Income Levels and Income Growth

	Dependent Variables			
	(1)	(2)	(3)	(4)
	Ln (Gross Income per HH)	Ln (Net Income per HH)	Annual growth gross income per HH	Annual growth net income per HH
Sample Mean	**7.576**	**7.138**	**0.0635**	**0.0622**
Election	-0.0939*	-0.0874*	-0.0543**	-0.0549*
	(0.0480)	(0.0459)	(0.0256)	(0.0298)
Haixuan	-0.0235	-0.0089	0.0231	0.0120
	(0.0395)	(0.0361)	(0.0314)	(0.0337)
Observations	3264	3263	1344	1344
F-test diff coeff (stat)	1.530	2.007	2.853	1.821
F-test diff coeff (p-value)	0.217	0.158	0.0926	0.179

All regressions include village and year fixed effects. Columns (3) and (4) also control for income lagged one and two periods.

Standard Errors are clustered at the village level

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Table 6: The Effects of Elections on Public Goods, Social Outcomes and Inequality

	Panel A. Dependent Variables					
	(1)	(2)	(3)	(4)	(5)	(6)
	Village has primary school	Adminstratives	2nd child allowed	2nd child allowed if 1st girl	Gini	Gini Net
Sample Mean	**0.885**	**5.439**	**0.389**	**0.697**	**0.280**	**0.306**
Election	0.0341**	-1.1989*	0.0744	0.1363***	-0.0112*	-0.0130**
	(0.0165)	(0.6155)	(0.0555)	(0.0441)	(0.0060)	(0.0064)
Haixuan	0.0276	0.3065	0.0878*	-0.0434	0.0028	0.0009
	(0.0288)	(0.2055)	(0.0516)	(0.0503)	(0.0061)	(0.0063)
Observations	4930	2290	2427	3744	3550	3763
F-test diff coeff (stat)	0.0333	5.810	0.0324	6.905	2.996	2.465
F-test diff coeff (p-value)	0.855	0.0168	0.858	0.00946	0.0849	0.118

	Panel B. Dependent Variables					
	Gross Income				Net Income	
	(7)	(8)	(9)	(10)	(11)	(12)
	inc10/inc90	inc10-inc90	inc50/inc90	inc50-inc90	inc10/inc90	inc50/inc90
Sample Mean	**0.275**	**-19347**	**0.529**	**-13915**	**0.248**	**0.528**
Election	0.0155*	5,845.7316**	0.0221**	5,053.4405**	0.0105	0.0153*
	(0.0080)	(2,708.4227)	(0.0093)	(2,401.5791)	(0.0078)	(0.0079)
Haixuan	0.0058	427.4711	-0.0021	704.2515	0.0049	0.0002
	(0.0082)	(3,815.3700)	(0.0098)	(3,447.5935)	(0.0077)	(0.0079)
Observations	3778	3778	3778	3778	3763	3763
F-test diff coeff (stat)	0.739	2.014	3.480	1.682	0.243	1.915
F-test diff coeff (p-value)	0.391	0.157	0.0635	0.196	0.623	0.168

	Panel C. Dependent Variables					
	Ln(Gross Income) by Quantiles			Ln(Net Income) by Quantiles		
	(13)	(14)	(15)	(16)	(17)	(18)
	10th	50th	90th	10th	50th	90th
Sample Mean	**8.284**	**9.005**	**9.677**	**7.627**	**8.553**	**9.222**
Election	-0.0090	-0.0429	-0.1005***	-0.0190	-0.0298	-0.0697*
	(0.0433)	(0.0271)	(0.0379)	(0.0547)	(0.0331)	(0.0361)
Haixuan	0.0242	-0.0171	-0.0187	0.0076	-0.0124	-0.0127
	(0.0379)	(0.0259)	(0.0385)	(0.0490)	(0.0340)	(0.0380)
Observations	3778	3778	3778	3755	3762	3763
F-test diff coeff (stat)	0.300	0.468	2.622	0.135	0.126	1.252
F-test diff coeff (p-value)	0.584	0.495	0.107	0.713	0.723	0.264

All regressions include village and year fixed effects.
Standard Errors are clustered at the village level

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Table 7: The Effects of Elections on Village Revenue and Asset Redistribution

	Panel A. Dependent Variables: Source of Village Fiscal Revenue (in logs)					
	(1) Collectives	(2) Households	(3) Workdays	(4) Firms	(5) Upper levels	(6) Other
Sample Mean	3.494	5.047	1.204	1.051	1.830	2.660
postel	0.3338	0.1936	0.0494	-0.2219	-0.2759	-0.4000
	(0.2700)	(0.2237)	(0.1959)	(0.2821)	(0.3340)	(0.4408)
poshaix	-0.2951	-0.0762	-0.1746	-0.0734	0.2346	0.2241
	(0.2382)	(0.2119)	(0.1978)	(0.2409)	(0.2480)	(0.2985)
Observations	3113	2886	1882	1673	1882	1673
F-test diff coeff (stat)	3.235	0.720	0.654	0.154	1.813	1.207
F-test diff coeff (p-value)	0.0735	0.397	0.420	0.695	0.180	0.273

	Panel B. Dependent Variables: Village Assets by onwnership					
	(7) Ln(Cooperatives)	(8) Ln(Households)	(9) Ln(Firms)	(10) Cooperatives/Total	(11) Households/Total	(12) Firms/Total
Sample Mean	3.894	8.504	1.278	0.277	0.677	0.0476
postel	-0.0041	0.2094*	-0.3551*	-0.0003	0.0490**	-0.0139
	(0.1838)	(0.1132)	(0.1835)	(0.0249)	(0.0202)	(0.0106)
poshaix	0.0059	0.0501	0.0508	-0.0547**	-0.0013	0.0055
	(0.2099)	(0.1190)	(0.2151)	(0.0257)	(0.0215)	(0.0103)
Observations	5208	2886	5208	3234	2880	3234
F-test diff coeff (stat)	0.00129	1.340	1.995	2.263	2.803	1.658
F-test diff coeff (p-value)	0.971	0.248	0.159	0.134	0.0955	0.199

All regressions include village and year fixed effects.

Standard Errors are clustered at the village level

APPENDIX Table A1: The effects of elections on Income Inequality by Year

Dummy variables for years to 1st elec	Dependent Variable: inc50-inc90
-3	511.9666
	(1,082.3916)
-2	1,136.0952
	(1,741.0206)
-1	1,006.9693
	(2,530.8654)
0	1,030.5468
	(3,074.0211)
+1	2,507.2036
	(3,923.2438)
+2	3,736.2949
	(4,567.5914)
+3	4,609.3318
	(5,149.7914)
+4	5,263.1330
	(5,803.4343)
+5	5,701.4228
	(6,368.1507)
+6	5,873.9945
	(7,011.6358)
+7	6,345.3968
	(7,745.6013)
+8	7,111.0049
	(8,355.5901)
+9	7,296.3605
	(9,129.0914)
+10	6,022.1925
	(9,988.6912)
Observations	2210
R-squared	0.741

All regressions include village and year fixed effects.

Standard errors are clustered at the village level.

Table A2: Fiscal Revenues and Expenditures of Village Governments

	Obs	Mean	Std. Dev.	Min	Max
Total Revenues (100 RMB)	**3,687**	**4,947**	**36,755**	**0**	**1,674,285**
from collectives	3,113	2,764	30,328	0	1,421,235
from HH	2,886	1,061	10,559	0	480,265
from obligated working days	1,882	69	218	0	3,710
from firms	1,673	440	4,262	0	127,750
from upper levels of government	1,882	158	754	0	12,868
from other sources	1,673	1,054	7,999	0	176,000
Total Expenditures (100 RMB)	**3,693**	**4,701**	**39,061**	**0**	**1,930,056**
collective production	2,886	1,972	35,441	0	1,794,526
HH production	2,111	461	2,260	0	53,100
delivery to upper levels of gov	2,979	475	2,270	0	66,120
public affairs	3,189	418	1,456	0	26,500
Administrative Expenditures	3,291	331	931	0	22,536

Table A3: Balance Sheet of Village Assets

	Obs	Mean	Std. Dev.	Min	Max
Assets owned by Collectives and Cooperatives:	5,208	10,512	67,810	0	1,810,200
Collectives	3,164	12,403	67,241	0	1,810,200
Cooperatives	1,882	8,238	60,832	0	1,169,900
Assets owned by Households:	2,886	17,670	147,111	0	4,602,788
Assets owned by Firms:	5,208	4,066	38,988	0	1,072,750
Partnership Enterprises	2,885	1,283	13,541	0	518,468
Private Enterprises	1,882	6,561	35,460	0	496,730
Joint venture Firms	1,672	3,064	32,151	0	576,020
Other	1,669	971	6,054	0	120,000
Total Assets	**3,244**	**41,471**	**187,713**	**0**	**4,649,281**

Table A4: The Effects of Elections on Taxation of Households

	Ln(Gross Inc - Net Income / Gross Income)				
	Mean	< 25th	25th - 50th	50th - 75th	>75th
	(1)	(2)	(3)	(4)	(5)
Sample Means	**0.362**	**0.332**	**0.312**	**0.315**	**0.362**
Election	-0.0045	-0.0019	0.0032	0.0023	-0.0068
	(0.0101)	(0.0078)	(0.0069)	(0.0077)	(0.0107)
Haixuan	-0.0083	-0.0095	-0.0084	-0.0045	-0.0084
	(0.0108)	(0.0085)	(0.0075)	(0.0086)	(0.0113)
Observations	3763	3762	3762	3763	3762
F-test diff coeff (stat)	0.0580	0.449	1.169	0.344	0.00849
F-test diff coeff (p-value)	0.810	0.503	0.281	0.558	0.927

All regressions include village and year fixed effects.
Standard errors are clustered at the village level.

Table A5: The Effects of Elections on Income and Consumption for a 48 Village Subsample

	Dependent Variables							
	Ln (Househod Income)				Ln (Household Consumption)			
	(1) < 25th	(2) 25th - 50th	(3) 50th - 75th	(4) >75th	(5) < 25th	(6) 25th - 50th	(7) 50th - 75th	(8) >75th
Sample Means	**8.411**	**8.958**	**9.313**	**9.927**	**7.969**	**8.346**	**8.584**	**8.900**
Election	-0.1502	-0.1596**	-0.1649*	-0.2874*	-0.1732	-0.2063*	-0.2588**	-0.3344***
	(0.1165)	(0.0710)	(0.0833)	(0.1524)	(0.1225)	(0.1078)	(0.1022)	(0.1093)
Haixuan	-0.0285	0.0434	0.0518	-0.1638	-0.0839	-0.0146	-0.0668	0.0520
	(0.1094)	(0.0794)	(0.0934)	(0.1861)	(0.1176)	(0.1270)	(0.0979)	(0.1429)
Observations	440	437	439	437	440	437	439	437
F-test diff coeff (stat)	1.029	6.483	6.075	0.718	0.945	3.483	4.413	4.817
F-test diff coeff (p-value)	0.318	0.0157	0.0191	0.403	0.338	0.0709	0.0434	0.0353

All regressions include village and year fixed effects.
Standard errors are clustered at the village level.

Chapter 3

Why Some Non-Democratic Regimes Hold Local Elections? The Role of Competence and Information

3.1 Introduction

Most of the theoretical literature on comparative politics and political economy studies non-democratic regimes as political systems in which a single government body takes all relevant decisions in an authoritarian way. However, this contrasts with two empirical observations. First, most non-democratic regimes exhibit some degree of decentralization and the government is structured in different layers that interact with one another. This is specially the case in large autocratic systems, such as China, in which some degree of decentralization in the decision making process is indispensable. Second, in the last few decades a considerable number non-democratic regimes have developed an array of seemingly democratic institutions, such as elections for executive offices and legislatures at different levels of government. Traditionally scholars have disregarded these institutions as meaningless but a recent upsurge in their study has revealed that these institutions vary widely in their level of power: from rubber stamp legislatures to real policy making bodies. Most of this recent literature has focused on the

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analysis of the causes and consequences of national level institutions,[1] and little attention has been paid to local level institutions.

This paper focuses on the study of the reasons for the existence of local elections in non-democratic regimes. The motivation for studying this topic is twofold. First, in contrast to national level autocratic elections, local level elections are oftentimes highly contested and elected leaders usually have substantial decision rights over relevant issues at the local level. One particular example is the case of China, where village level elections are regularly held since the early 1980s and elected leaders have a wide range of powers at the village level.[2] Second, sub-national elections are a common phenomena in many non-democratic regimes such as Indonesia under Suharto (1968 - 1998), Bangladesh under Ershad (1982 - 1990), Brazil during the military dictatorship (1964 - 1985), Pakistan under Musharraf (1999 - 2007) and China since the early 1980s as mentioned before. Also, in recent years a number of autocratic regimes have introduced local elections: Vietnam since 2003, Saudi Arabia since 2005 and Yemen since 2001.[3]

In order to better understand what are the trade-offs involved in the decision to allow local elections, I develop a theoretical framework in which a dictator decides, at the constitutional table, whether to establish an appointment or an election system to select local politicians. Local politicians have two characteristics that are payoff relevant for the dictator and for citizens: competence and ideology. Both citizens and the dictator have a preference for competent local politicians but they have conflicting views on the ideological dimension. Voters are homogenous on their preference for competence but heterogenous on their ideological positions. Local politicians' ideology is common knowledge, but citizens and the dictator have private information about the competence level of the politician. This specification is particularly suited for local elections since it is likely that voters, and possibly also the dictator, have personally interacted with candidates at some point and therefore, they are differentially informed about candidates' competence level. Notice that *competence* could be interpreted more broadly as any other characteristic of the local politician that is a common value for the dictator and for citizens, such as honesty or local knowledge on which policies are the most suited for a specific area. In either method of selection, local politicians face the risk of dismissal upon taking office:

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[1] See for instance Gandhi and Przeworski (2006), Boix and Svolik (2008), and Wright (2008).

[2] See Martinez-Bravo et. al. (2010) for documentation on these elections.

[3] See Birney 2007.

if they fail to deliver a baseline level of utility to the dictator there will be a military intervention that deposes them from their positions. This specification makes the model specific to non-democratic regimes, which lack the democratic checks and balances that would make this action non-feasible for the national ruler.

The model highlights that if the dictator has a high valuation of local politicians' competence and voters have an intermediate valuation of competence relative to the costs of military intervention, then the election system is ex-ante preferred by the dictator. The intuition for this result is the following: elections generate a method to aggregate disperse private information about the level of competence of local candidates, and therefore provide a quite accurate screening mechanism of competent candidates. In contrast, the appointment system leads to a much worse screening system because the dictator bases his decision only on his own private signal. In this set of parameters, voters' optimal behavior leads to the dictator's crony being elected most of the times, whereas the opposition candidate is only elected if he is substantially more competent than the dictator's crony. In this case, the dictator's ex-ante payoff is maximized.

If instead voters' valuation of competence is low and voters' cost of intervention is very high, voters take the conservative approach of always electing the dictator's crony regardless of his competence level, since for most voters voting for the opposition candidate is not worth the risk. In this case, voters' behave in the aggregate as if they would disregard their private information, which leads to a suboptimal outcome for the dictator. For this set of parameters the appointment system is at least as good as the election system, since the dictator can always replicate this outcome as an appointment strategy.

If voters' valuation of competence is high and they incur in low costs in the event of military intervention, the opposition candidate is elected more often. In this scenario the dictator can also be better-off under an appointment regime as long as the dictator experiences enough disutility from ideological differences.

Therefore, the model highlights that the presence of a threat of military intervention makes ex-post voters' preferences more aligned to those of the dictator than they would be in a fully democratic regime. However, the degree of alignment is non-monotonic in voters' costs of military intervention or in voters' valuation of competence: alignment is maximized when voters are somewhat constrained in their voting decisions, but not as much as to prevent real

contestation of local power.

An additional result of the model is the absence of military interventions along the equilibrium path in an election system with a large enough electorate: since voters also suffer costs from a military intervention they are reluctant to elect a candidate that will originate an intervention. The superior screening mechanism of competence that the election system represents, enables voters to avoid the scenario of intervention.

As an extension of the model, I explore whether the method of selection of local politicians can also affect the composition of the pool of candidates that are willing to get into politics. In particular, I model the entry decision of candidates, under the assumption that they have private information about their competence level in the private sector, which is positively correlated with competence as policymakers. The model highlights that, under certain conditions, the appointment system leads to a pool of applicants of lower average competence than the election regime. The intuition for this result is the following: since the appointment system leads to an imperfect screening mechanism of competence, military interventions to unseat a local politician take place along the equilibrium path. If unseated politicians suffer high costs of these interventions, the probability of these events happening makes candidates reluctant to get into politics, especially if they are competent in the private sector and thus, have a better outside option. In contrast, for a large enough electorate there are no military interventions under an election system, which makes candidates more likely to get into politics. In other words, the election system can become an insurance type of mechanism for candidates: even if they turn out to be incompetent as policymakers, they will not be dismissed from office because they would not have been elected in the first place. This additional advantage of the election system in terms of the quality of candidates makes the dictator prefer elections over appointment for a larger set of parameters, relative to the specification in which entry decisions are not modelled.

Several scholars have suggested that local elections have been used by non-democratic regimes as a device to achieve better leadership. For example Kelliher (1997) points out that one of the motivations of Chinese national leaders to implement village elections was the selection of more competent officials. Kelliher summarizes this argument in the following statement: "If you want to get younger, educated, technically able people into office, then let villagers

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make the selection from their own ranks".[4] Therefore, Kelliher suggests that villagers were better informed about which villagers would make better leaders and elections were expected to be a mechanism to select those leaders into office. Kelliher also reports that nobody with talent wanted to become a village cadre under the appointment system, since competent people jumped into the lucrative rural economy. However, he does not provide a comprehensive explanation why talented villagers would be more willing to get involved in politics in an election system than in an appointment system. This paper provides a rationale for this finding, which is related to the lower risk of ex-post dismissal in the election regime.

This paper relates to a number of different literatures. First, it is connected to the political science and economics literature that explores what are the reasons why some autocratic regimes have some democratic type of institutions. Some examples are Boix and Svolik (2008) which argue that legislatures are a method to co-opt political elites in order to make them benefit from the regime and minimize the risk of real contestation of power. Similar arguments are used by Magaloni (2006) who argues that elections are a way of co-opting party members and by Gandhi and Przeworski (2006), and Gandhi (2008) who claim that elections are also used to co-opt larger groups in society by distributing spoils of government. Other authors suggest that national elections in which the dictator wins by a landslide victory, serve as a signal to the opposition that fighting the regime is futile since it benefits from a large popular support (some examples are Geddes (2005), Simpser (2005), Magaloni (2006), Malesky and Schuler (2008)). Elections can also provide information to the ruler about where are their bases of support and opposition Magaloni (2006), Brownlee (2007) and provide national rules information about the competence and loyalty of party cadres Birney (2007), Blaydes (2008).[5]

Second, this paper contributes to the literature that investigates the determinants of the quality of the politicians. Some examples are Dal Bó, Dal Bó, Di Tella (2002), Caselli and Morelli (2004), Banerjee and Pande (2007) and Egorov and Sonin (2006). This paper is more closely related to the latter one which also focuses on non-democratic regimes. Egorov and Sonin (2006) highlight that the threat of sever punishment can deter competent subordinates from getting into politics. If the dictator could commit to a lower punishment level he would

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[4]Kelliher (1997) pp. 69.

[5]For a more detailed description of this literature see Gandhi and Lust-Okar (2009).

be ex-ante better-off. This paper is complimentary to theirs, since it suggests that elections can provide this commitment mechanism to an autocratic regime, by insuring subordinates against this punishment along the equilibrium path.

Third, this paper also relates to the literature that studies the endogenous formation of political institutions such as Aghion, Alesina and Trebbi (2004), Trebbi, Aghion and Alesina (2007) and Acemoglu, Ticchi and Vindigni (2009). Similarly it also links to the studies on the trade-offs of appointment versus election regimes Alesina and Tabellini (2007, 2008), Maskin and Tirole (2004).

Finally, it relates to the theoretical literature on information aggregation in elections with private information, which dates back to Condorcet early mathematical analysis, in particular to the establishment of the Condorcet Jury Theorem. Some more recent contributions are Ladha (1992), Lohmann (1993), Austen-Smith (1990) and Feddersen and Pesendorfer (1997). This paper is more closely related to the latter study which examines elections as a mechanism for the aggregation of information when voters have both a private and a common value (for instance, ideology and competence).[6]

3.2 Model

In this section I develop the baseline model in which candidates are randomly selected and they are not allowed to decide whether to get into politics. However, as we will see, elections can still be ex-ante preferred by the dictator for certain sets of parameters.

3.2.1 Set-up

Consider an economy populated by three types of agents: a dictator, candidates for mayor and voters. All agents live for one period. The game starts at the "constitutional table" where the dictator decides the method of selection of mayors among two different options: appointment or elections. In the appointment system the dictator appoints one individual out of the set of

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[6]Their result is similar to the findings in this paper in which elections satisfy full information equivalence. This is despite Feddersen and Pesendorfer restrict voters to non-naive voting strategies: voters take their voting decisions as if they were pivotal *and* updating their beliefs to the scenario of being pivotal.

candidates for mayor. In the election system, voters vote for their preferred candidate and the candidate that obtains the higher number of votes becomes mayor.

Mayors have two characteristics that are payoff relevant for the dictator and for citizens. The first characteristic is competence which valued both by the dictator and by voters. Let $A^j \in \{\underline{A}, \overline{A}\}$ denote the competence level of the mayor j where $\overline{A} > \underline{A} > 0$. *Competence* can be broadly interpreted as any characteristic of the local politician that is a common value for the dictator and for citizens, such as honesty or local knowledge on which policies are more suited for a specific area. The second relevant characteristic of mayors is their ideological stance on a given issue. Ideology could reflect certain policy preferences but also an stance in a non-economic issue, such as religion or ethnic group. Mayors belong to one of two possible ideological groups or political parties $\lambda^j \in \{\lambda^L, \lambda^R\}$, satisfying $\lambda^L < 0$ and $\lambda^R > 0$. Ideological group R is the one more closely aligned with the dictator while ideological group L is a moderate opposition group. Let λ_r denote the dictator's ideological bliss point which satisfies $|\lambda^L - \lambda_r| > |\lambda^R - \lambda_r|$. Voters' ideological bliss points are uniformly distributed in the interval $[\frac{-1}{2\psi}, \frac{1}{2\psi}]$. Candidates' ideology is common knowledge, which could be interpreted as candidates having a publicly known party affiliation. In contrast, there is imperfect information about the level of competence of candidates for mayors. This is a natural assumption for most political contexts, since performance of politicians is difficult to evaluate and citizens have limited information about the abilities of politicians, specially for those that have not served in office yet.

The dictator's utility when the mayor in office has characteristics (A^j, λ^j) is given by the following function:

$$u^r(A^j, \lambda^j | \lambda_r) = \alpha_r A^j - |\lambda^j - \lambda_r| - \mu C \tag{3.1}$$

where α_r captures the strength of the preference for a competent mayor, μ is a dummy that takes value 1 if the previous mayor was dismissed (i.e. there was a military intervention) and C are the costs associated with such intervention.

The level of utility of voter with ideology λ_i when the mayor in office has characteristics (A^j, λ^j) is given by the following expression:

$$u^c(A^j, \lambda^j | \lambda_i) = \alpha A^j - |\lambda^j - \lambda_i| - \mu \phi \tag{3.2}$$

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where α captures voters' preference for a competent mayor, μ is a dummy that takes value 1 if the previous mayor was dismissed and $\phi > 0$ are the costs for voters associated with such intervention. These costs are paid by all voters regardless of their voting decision. Therefore, these costs should be interpreted as costs associated with the unrest or the disruption generated by the military intervention and not a punishment for a certain voting decision.

Once the dictator has chosen the method of selection of mayors (appointment or elections), nature randomly selects one candidate for mayor from each ideological group. Each candidate has $\frac{1}{2}$ probability of being competent or incompetent. Therefore, there are four possible and equally likely states of the world depending whether each of the randomly selected candidates are competent or incompetent. Let me define the state of the world as relative competence of candidate R with respect to candidate L, $\theta = A^R - A^L$. Let $\theta \in \left\{ \kappa, \overline{0}, \underline{0}, -\kappa \right\}$ denote the four possible states of the world where $\kappa = \overline{A} - \underline{A}$ and $\overline{0}$ and $\underline{0}$ refer to the cases in which both candidates have the same level of competence because both are competent and incompetent, respectively.

In an election system, nature also selects the electorate: she randomly draws n voters from the voter distribution $\lambda_i \sim U[\frac{-1}{2\psi}, \frac{1}{2\psi}]$. During the electoral campaign each voter in the electorate receives an independent signal of the state of the world $s \in \left\{ \kappa, \overline{0}, \underline{0}, -\kappa \right\}$. The signal is correct with probability $p > \frac{1}{3}$, and each possible incorrect signal is received with probability $\frac{1-p}{3}$. In an appointment system, the dictator gets a private signal from each candidate that has the same accuracy as voters' signal.

After receiving the private signals, voters and the dictator update their beliefs using Bayes' Rule. Under an appointment system the dictator appoints the candidate that generates the higher expected utility conditional on the signal that the dictator receives. In election system, each voter votes for the candidate that would lead to the highest expected payoff conditional on his posterior beliefs. Therefore I assume that voters can not abstain and vote sincerely. The candidate that obtains the highest number of votes becomes the new mayor.

Once the elected or appointed mayor takes office his competence as policymaker is revealed. Since the central government is autocratic, the dictator has the possibility to military intervene in the region in order to dismiss the new mayor. The opportunity of ex-post intervention makes the model specific to non-democratic regimes, since democracies are usually characterized by

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having a number of checks and balances that prevent the central government from dismissing a mayor that has been elected or appointed to serve one term. A military intervention imposes costs of C on the dictator, which capture the direct costs of the military operation but also the expected disutility of social unrest that a military intervention can originate. Moreover, I assume that the cost of two consecutive interventions would be prohibitive and therefore, the dictator only appoints a candidate R after a military intervention. Nature randomly chooses a new candidate R that has $\frac{1}{2}$ probability of being competent and $\frac{1}{2}$ probability of being incompetent.[7] The costs for the dictator of two consecutive interventions might excessively high if they led to protest, conflict or loss of legitimacy of the overall regime with high probability.

Next, I summarize the timing of events:

1. The dictator chooses the selection method of mayors: appointment or election system.

2. Nature chooses one candidate from each ideological group: L and R.

3. If the appointment method is chosen:

   (3a) The dictator gets a private signal of the competence of each candidate.

   (3b) Upon updating his beliefs, the dictator decides to appoint one of the two candidates.

   (3c) The appointed mayor takes office and his competence level is revealed.

   (3d) The dictator decides whether to military intervene in the region to dismiss the mayor. If there is no intervention ($\mu = 0$) payoffs are distributed and the game ends. If there is an intervention ($\mu = 1$) the dictator incurs in costs C and voters incur in cost ϕ. Nature randomly chooses a candidate R who is automatically appointed as new mayor. Then, payoffs are distributed and the game ends.

4. If the election method was chosen:

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[7]Notice that I am assuming the dictator does not obtain any additional private signals after a military intervention. We could interpret this as the dictator having implement the new appointment within a limited amount of time that prevents an evaluation the candidate's competence. In this case, since costs of a second intervention are prohibitive, the dictator cannot commit to dismiss an incompetent L candidate. Therefore, appointing candidate R leads to a higher expected payoff for the dictator: both candidates have the same expected competence, but candidate R is closer ideologically.

(4a) Nature chooses the electorate by taking n independent draws from the voter's ideological distribution $\lambda_i \sim U[\frac{-1}{2\psi}, \frac{1}{2\psi}]$.

(4b) Each voter in the electorate receives a signal of the competence of each candidate.

(4c) Upon updating their beliefs, each voter votes for the candidate that leads to the highest expected utility if winning.

(4d) The candidate that obtains the highest number of votes takes office and his competence is revealed.

(4e) The dictator decides whether to military intervene the region to dismiss the mayor. If there is no intervention ($\mu = 0$) payoffs are distributed and the game ends. If there is an intervention ($\mu = 1$) the dictator incurs in costs C and voters incur in cost ϕ. Nature randomly chooses a candidate R who is automatically appointed as new mayor. Then, payoffs are distributed and the game ends.

Notice that in the specified timing of events, candidates for mayor play a very passive role since they always become official candidates upon being selected by nature. In section 3.3.1 of this paper I enrich the model by allowing candidates to decide whether to get into politics or not, which lead to some additional insights. In the next subsection, I proceed to characterize the set of equilibria for the baseline specification in which entry of politicians is not modeled.

3.2.2 Characterization of Equilibria

The game defined in the above set-up constitutes a sequential game of incomplete information and I proceed to solve it by backward induction. In this section I first study the election and appointment regimes separately and then I proceed to compare them in order to evaluate which of them leads to a higher ex-ante expected utility for the dictator.

Non-Intervention Constraint

First I specify the condition that determines whether a military intervention takes place. The dictator will not undertake a military intervention as long as the characteristics of the new

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mayor (A^j, λ^j) satisfy the following condition:

$$\alpha_r A^j - |\lambda^j - \lambda_r| \geq \alpha_r \left(\frac{\overline{A}}{2} + \frac{\underline{A}}{2} \right) - |\lambda^R - \lambda_r| - C \tag{3.3}$$

where the left hand side of the above inequality is the payoff that the dictator obtains when mayor (A^j, λ^j) serves one term in office, whereas the right hand side corresponds to the expected payoff for the mayor of dismissing the mayor and appointing a candidate R randomly drawn from the candidate population.

We focus on the set of parameters described by the following two assumptions (for notational simplicity let me define $\delta \equiv |\lambda^L - \lambda_r| - |\lambda^R - \lambda_r|$).

Assumption 1.

$$\alpha_r \kappa > \delta \tag{3.4}$$

Assumption 2.

$$2C > \alpha_r \kappa \geq \max \left\{ 2\left(\delta - C \right), 2\left(C - \delta \right) \right\} \tag{3.5}$$

Assumption 1 guarantees that the dictator's preference for competence outweighs the ideological differences between candidates. By imposing Assumption 2 we focus in the set of parameters such that the dictator dismisses incompetent L candidate, but does not dismiss incompetent R or competent L. Therefore, the dictator is willing to tolerate some opposition in exchange of having a competent leader. However, the costs of military intervention need to be high enough to rule out the unintuitive result of the dictator dismissing an incompetent supporter to obtain another drawn from the mayor distribution.

Election System

In this subsection I analyze the political equilibrium when the method of selection of mayors is plurality rule elections. In order to characterize voters' behavior, let $v(\theta, \lambda_i)$ denote the difference in expected utility that voter with ideology λ_i obtains when candidate R wins the election relative to when candidate L wins the election and state of the world is θ.

$$v(\theta, \lambda_i) = U^c(A^R, \lambda^R | \lambda_i) - U^c(A^L, \lambda^L | \lambda_i) \tag{3.6}$$

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where $U^c(.,.|\lambda_i)$ already incorporates the payoffs that would follow in the event of a military intervention.[8] Hence, function $v(\theta, \lambda_i)$ incorporates that voters fully anticipate the possibility of military intervention and take into account this information in their voting decisions. It takes the following values in each state of the world:

$$
\begin{aligned}
v(\theta = \kappa, \lambda_i) &= \tfrac{1}{2}\alpha\kappa + \phi \\
v(\theta = \underline{0}, \lambda_i) &= -\tfrac{1}{2}\alpha\kappa + \phi \\
v(\theta = \overline{0}, \lambda_i) &= |\lambda^L - \lambda_i| - |\lambda^R - \lambda_i| \\
v(\theta = -\kappa, \lambda_i) &= -\alpha\kappa + |\lambda^L - \lambda_i| - |\lambda^R - \lambda_i|
\end{aligned}
$$

Upon receiving a signal, each voter in the electorate updates her beliefs about the likelihood of each state of the world and computes the expected value of function $v(\theta, \lambda_i)$. A voter votes for candidate R after receiving signal $x \in \{\kappa, \overline{0}, \underline{0}, -\kappa\}$ if the following holds

$$
E(v(\theta, \lambda_i)|s = x) \geq 0 \tag{3.7}
$$

Notice that this expected utility is weakly increasing in λ_i: naturally, the higher λ_i the more likely is that the voter votes for R, for any given signal. Let $\lambda_{s=x}$ denote the voter for which (3.7) holds with equality for $x \in \{\kappa, \underline{0}, \overline{0}, -\kappa\}$.[9] Notice that this voter is indifferent between voting for R or L when he receives signal $s = x$, whereas voters with ideological bliss points λ_i such that $\lambda_i < \lambda_{s=x}$ vote for candidate L and voters such that $\lambda_i > \lambda_{s=x}$ vote for candidate R when getting signal $s = x$.

We focus on the set of parameters such that these four thresholds are in the interval $[\lambda^L, \lambda^R]$. The following assumption ensures that this is the case.

Assumption 3.

$$
\lambda^R - \lambda^L > \min\left\{ \frac{3p\alpha\kappa - 2(1\text{-}p)\phi}{2p+1}, \frac{3(3p\text{-}1)\alpha\kappa + (2p+1)2\phi}{4(1-p)} \right\} \tag{3.8}
$$

---

[8] In particular, $U^c(.,.|\lambda_i)$ is defined in the following way: $U^c(A^R, \lambda^R|\lambda_i) = u^c(A^R, \lambda^R|\lambda_i)$; $U^c(A^L, \lambda^L|\lambda_i) = u^c(\overline{A}, \lambda^L|\lambda_i)$ if $A^L = \overline{A}$; and $U^c(A^L, \lambda^L|\lambda_i) = \tfrac{1}{2}u^c(\underline{A}, \lambda^R|\lambda_i) + \tfrac{1}{2}u^c(\underline{A}, \lambda^R|\lambda_i) - \phi$ if $A^L = \underline{A}$, where $u^c(.,.|\lambda_i)$ is defined by (3.2)

[9] See the Appendix for analytical expressions of the expected utility and for these thresholds.

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Assumption 3 requires that the ideological distance between candidates is large enough relative to voters' valuation of competence.[10] This assumption allow us to have a wide enough distribution of voters' types so that there are voters that follow each possible voting strategy.[11] Finally, one additional restriction in the set of parameters is imposed to focus on voter strategies that minimize the risk of military intervention.

Assumption 4.

$$\phi > \max \left\{ \frac{\alpha\kappa}{2}, \lambda^R + \lambda^L \right\}$$

Condition $\phi > \frac{\alpha\kappa}{2}$ ensures that the mass of voters that vote for R upon getting signal $s = \underline{0}$ is higher than the mass of voters that vote for R when receiving signal $s = \overline{0}$. This means that voters are conservative in their voting decisions and try to avoid having a military intervention by voting for R if they get a signal that suggest that voter L is incompetent.[12] Condition $\phi > \lambda^R + \lambda^L$ requires that the cost for voters of having a military intervention is higher than the electoral advantage of candidate L relative to candidate R. This assumption guarantees that voters' costs of intervention outweighs candidate L's potential electoral advantage. This auxiliary assumption is made to reduce the number of cases of the parameter set to study.[13]

Given the above assumptions we can establish the following result.

Lemma 3 *Under Assumptions A1, A2, A3, and A4 we have*

$$\lambda^L < \lambda_{s=\kappa} < \lambda_{s=\underline{0}} < \lambda_{s=\overline{0}} < \lambda_{s=-\kappa} < \lambda^R$$

---

[10]Inequality $\lambda^R - \lambda^L > \frac{3p\alpha\kappa - 2(1-p)\phi}{2p+1}$ is equivalent to $\lambda^R > \lambda_{s=\kappa}$, whereas $\lambda^R - \lambda^L > \frac{3(3p-1)\alpha\kappa + (2p+1)2\phi}{4(1-p)}$ is equivalent to to $\lambda^L < \lambda_{s=-\kappa}$. For $p < 0.8$ the latter inequality implies former.

[11]In particular there are voters that always vote for canidate L and others that always vote vor candidate R, regardless of their signal. Assumption 4 also ensures that the four thresholds exist and their expressions are as shown in the Appendix.

[12]In particular condition $\phi > \frac{\alpha\kappa}{2}$ implies that $\lambda_{s=\underline{0}} < \lambda_{s=\overline{0}}$ holds. If this did not hold, a large proportion of voters would find optimal to vote for candidate L when receiving signal $s = \underline{0}$ in order to originate a military intervention that would enable them having another draw from the candidate distribution and facing a $\frac{1}{2}$ probability of having a competent mayor in office.

[13]Notice that if $\lambda^R + \lambda^L > 0$ more than half of the voters are closer ideologically to candidate L relative to candidate R. Also, notice that if ideological positions of candidates are equidistant from 0, or if more than half of voters are ideologically closer to candidate R, condition $\phi > \lambda^R + \lambda^L$ is always satisfied since $\phi > 0$.

These thresholds divide the voter distribution in five sections that lead to different voting strategies:

Region A: If $\lambda_i \in [\frac{-1}{2\psi}, \lambda_{s=\kappa})$ vote for candidate L regardless of the signal.

Region B: If $\lambda_i \in [\lambda_{s=\kappa}, \lambda_{s=\underline{0}})$ vote for R if $s = \kappa$; vote for L if $s \in \{\underline{0}, \overline{0}, -\kappa\}$.

Region C: If $\lambda_i \in [\lambda_{s=\underline{0}}, \lambda_{s=\overline{0}})$ vote for R if $s \in \{\kappa, \underline{0}\}$; vote for L if $s \in \{\overline{0}, -\kappa\}$.

Region D: If $\lambda_i \in [\lambda_{s=\overline{0}}, \lambda_{s=-\kappa})$ vote for R if $s \in \{\kappa, \underline{0}, \overline{0}\}$; vote for L if $s = -\kappa$.

Region E: If $\lambda_i \in [\lambda_{s=-\kappa}, \frac{1}{2\psi}]$ vote for R regardless of the signal.

Let P_h for $h \in \{A, B, C, D, E\}$ denote the mass of voters in each of these regions.

We now turn to define the probability that a randomly drawn voter votes for candidate R. Notice that this depends on the mass of voters in each of the regions defined above, but also on the state of the world, since this will affect the likelihood of obtaining each possible signal. Let $q_{\theta=x}$ denote the probability that a randomly drawn voter votes for candidate R when state of the world is $\theta = x$. This is defined by

$$q_{\theta=x} = \Pr\left(s=\kappa|\theta=x\right)P_B + \Pr\left(s \in \{\kappa, \underline{0}\}|\theta=x\right)P_C + \Pr\left(s \in \{\kappa, \underline{0}, \overline{0}\}|\theta=x\right)P_D + P_E \quad (3.9)$$

It is straightforward to show that given the above assumptions we have $q_{\theta=\kappa} > q_{\theta=\underline{0}} > q_{\theta=\overline{0}} > q_{\theta=-\kappa}$. Therefore, the more competent is candidate R with respect to L, the more likely is candidate R to win.

The probability that candidate R wins in an election with an electorate of size n, can be expressed as the probability that at least $\frac{n+1}{2}$ voters vote for candidate R. Let $P_{\theta=x}^n$ denote this probability which takes the following expression:[14]

$$P_{\theta=x}^n = \sum_{k=\frac{n+1}{2}}^{n} \binom{n}{k} \left(q_{\theta=x}\right)^k \left(1 - q_{\theta=x}\right)^{n-k} \text{ for } x \in \{\kappa, \overline{0}, \underline{0}, -\kappa\} \quad (3.10)$$

The Condorcet Jury Theorem establishes that if votes are independent and the probability that a voter votes for a particular candidate is higher than $\frac{1}{2}$, then the probability that this candidate wins the election converges to 1 as the size of the electorate goes to infinity. In terms of the model notation this is summarized by the following Proposition.

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[14]See the Appendix for expressions of $q_{\theta=x}$ and $P_{\theta=x}^n$ for each state of the world.

Proposition 4 (Condorcet Jury Theorem) *If votes are statistically independent and $q_{\theta=x} > \frac{1}{2}$, then $P^n_{\theta=x} > q_{\theta=x}$ and $P^n_{\theta=x} \longrightarrow 1$ as $n \to \infty$. Similarly, if votes are statistically independent and $q_{\theta=x} < \frac{1}{2}$, then $P^n_{\theta=x} > q_{\theta=x}$ and $P^n_{\theta=x} \longrightarrow 0$ as $n \to \infty$. Finally, if $q_{\theta=x} = \frac{1}{2}$ then $P^n_{\theta=x} = \frac{1}{2}$.*

Proof. See Ladha (1992) for a proof of the Condorcet Jury Theorem.

Given assumption 4 and given that $p > \frac{1}{3}$, $q_{\theta=\underline{0}}$ always takes values above $\frac{1}{2}$, which implies $q_{\theta=\kappa} > q_{\theta=\underline{0}} > \frac{1}{2}$. Hence, for a large enough electorate candidate R wins the election with probability arbitrarily close to 1 in the states of the world $\{\kappa, \underline{0}\}$. Whether candidate R also wins the election when the states of the world are $-\kappa$ or $\overline{0}$ depends on the set of parameters. In order to explore the different cases let me define the following two conditions:

Condition 1.

$$q_{\theta=-\kappa} < \frac{1}{2} \iff \alpha\kappa > \frac{12\,(2p+1)}{(8+7p+26p^2)^2}\left(\phi - \lambda^R - \lambda^L\right) \tag{3.11}$$

Condition 2.

$$q_{\theta=\overline{0}} < \frac{1}{2} \iff \alpha\kappa > \frac{12\,(2p+1)}{(4+25p\text{-}38p^2)^2}\left(\phi - \lambda^R - \lambda^L\right) \tag{3.12}$$

Notice that since $q_{\theta=\overline{0}} > q_{\theta=-\kappa}$, Condition 1 holds whenever Condition 2 holds, and Condition 2 does not hold if condition 1 does not hold. The following proposition describes the electoral result for each set of parameters.

Proposition 5 (Electoral Outcome) *Suppose assumptions A1, A2, A3, and A4 hold.*

1. *If Condition 1 does not hold, the probability that candidate R wins converges to 1 in all possible states of the world as the size of the electorate goes to infinity (i.e. $P^n_{\theta=x} \longrightarrow 1$ $\forall x \in \left\{\kappa, \overline{0}, \underline{0}, -\kappa\right\}$ as $n \to \infty$).*

2. *If Condition 1 holds but Condition 2 does not hold, the probability that candidate R wins converges to 1 in states of the world $\theta \in \left\{\kappa, \overline{0}, \underline{0}\right\}$ and converges to 0 if $\theta = -\kappa$ as the size of the electorate goes to infinity (i.e. $P_{\theta=x}^n \longrightarrow 1$ for $x \in \left\{\kappa, \overline{0}, \underline{0}\right\}$ and $P_{\theta=-\kappa}^n \longrightarrow 0$ as $n \to \infty$).*

3. *If Condition 2 does hold, the probability that candidate R wins converges to 1 in states of the world $\theta \in \{\kappa, \underline{0}\}$ and converges to 0 in states of the world $\theta \in \left\{\overline{0}, -\kappa\right\}$ as the size of the electorate goes to infinity (i.e. $P_{\theta=x}^n \longrightarrow 1$ for $x \in \{\kappa, \underline{0}\}$ and $P_{\theta=-\kappa}^n \longrightarrow 0$ for $\theta \in \left\{\overline{0}, -\kappa\right\}$ as $n \to \infty$).*

Proof. See the Appendix.

The above proposition leads to a number of intuitive results. When voters have a low valuation of competence or high costs of military intervention (condition 1 does not hold), elections are not contested: candidate R wins the elections with probability arbitrarily close to 1 regardless of the state of the world. For the majority of voters, the potential costs of facing the risk of military intervention are so high relative to the modest benefits of a competent L candidate, that it is not worth for voters to take the risk and vote for L. In the aggregate, voters behave as if they disregard their private information, electing candidate R regardless his relative competence level.

If voters' valuation of competence relative to costs of intervention is intermediate (Condition 1 holds, Condition 2 does not hold), elections are contested and there is alternation of power between the two ideological groups. However, the electoral result is substantially biased towards candidate R, since candidate L only wins in the event he is competent and faces an incompetent opponent.

Finally, if voters' valuation of competence is high relative to the costs of intervention (Condition 2 holds), elections are also contested but candidate L wins the election more often: whenever candidate L is competent. Notice that, even in this case, an incompetent candidate L is never elected into office and, consequently there are not military interventions along the equilibrium path.[15]

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[15] As long as the electorate is large enough.

The next proposition summarizes the ex-ante expected utility that the dictator obtains from an electoral system with a large enough electorate, for each set of parameters.

Proposition 6 (Dictator's Ex-ante Utility Election System) *Suppose assumptions A1, A2, A3, and A4 are satisfied.*

1. *If Condition 1 does not hold, the dictator's ex-ante utility from an election system is*

$$\lim_{n \to \infty} E\left(u^r\left(elect|\lambda_r, \rceil C1\right)\right) = \frac{1}{2}\alpha_r\left(\overline{A} + \underline{A}\right) - |\lambda^R - \lambda_r| \tag{3.13}$$

2. *If Condition 1 holds but Condition 2 does not hold, the dictator's ex-ante utility from an election system is*

$$\lim_{n \to \infty} E\left(u^r\left(elect|\lambda_r, C1, \rceil C2\right)\right) = \alpha_r\left(\frac{3\overline{A}}{4} + \frac{A}{4}\right) - \frac{3}{4}|\lambda^R\text{-}\lambda_r| - \frac{1}{4}|\lambda^L\text{-}\lambda_r| \tag{3.14}$$

3. *If Condition 2 holds, the dictator's ex-ante utility from an election system is*

$$\lim_{n \to \infty} E\left(u^r\left(elect|\lambda_r, C2\right)\right) = \alpha_r\left(\frac{3\overline{A}}{4} + \frac{A}{4}\right) - \frac{1}{2}|\lambda^R\text{-}\lambda_r| - \frac{1}{2}|\lambda^L\text{-}\lambda_r| \tag{3.15}$$

Proof. See the Appendix.

The comparison of these ex-ante levels of utility leads to a number of insights. First, notice that given Assumption 1, the dictator achieves a higher ex-ante utility from an election system when voters have an intermediate valuation of competence relative to costs of intervention (case 2) than when this valuation is low (case 1). The intuition for this result is the following: since the dictator's preference for competence outweighs the ideological differences between candidates, the dictator is better-off when voters aggregate their private information to screen competent politicians than when they entirely disregard their private information to always elect candidate R.

Second, the dictator is ex-ante better-off when voters' valuation of competence relative to costs of intervention is intermediate (case 2) rather than high (case 3). In the latter case candidates from ideological group L takes office half of the times, which leads to a higher ideological disutility.

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To sum up, a dictator that values competence of mayors benefits the most from an election system when voters are somewhat constrained by the ex-post risk of military intervention: constrained enough so that they do not elect candidate L too often; but not as constrained as to disregard their private information and elect candidate R regardless of his competence level.

We now turn to examine the appointment system in order to study it in relative terms to the election system.

Appointment System

In an appointment system, the dictator decides which of the two candidates to appoint based only on his private information. His decision is similar to voters' decision: the dictator appoints the candidate that leads to the highest expected utility conditional on the signal he obtains. Let $v^r(\theta, \lambda_r)$ denote the utility difference of the dictator between appointing candidate R and candidate L, when the state of the world is θ.

$$v^r(\theta, \lambda_r) = U^r(A^R, \lambda^R|\lambda_r) - U^r(A^L, \lambda^L |\lambda_r)$$

where $U^r(., .|\lambda_r)$ already incorporates the payoffs that would follow in the event of a military intervention.[16] Therefore, function $v^r(\theta, \lambda_r)$ incorporates that the dictator anticipates the possibility of military intervention and takes into account this information in his appointment decisions. Upon receiving his signal, the dictator updates his beliefs about the likelihood of each state of the world. The dictator appoints candidate R if the expected value of $v^r(\theta, \lambda_r)$ given his posterior beliefs is positive.

It is straightforward to see that the dictator always appoints candidate R upon receiving signals $s \in \{\kappa, \underline{0}, \overline{0}\}$. Intuitively, since the dictator is closer ideologically to candidate R, he always finds it optimal to appoint R when receiving a signal that indicates R is as at least as competent as candidate L. Whether the dictator is willing to appoint candidate L upon receiving signal $s = -\kappa$, depends on the dictator's preference for competence relative to ideology and costs of intervention.[17]

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[16]In particular, $U^r(A^R, \lambda^R|\lambda_r) = u^r(A^R, \lambda^R|\lambda_r)$; $U^r(A^L, \lambda^L |\lambda_r) = u^r(\overline{A}, \lambda^L|\lambda_r)$ if $A^L = \overline{A}$; and $U^r(A^L, \lambda^L|\lambda_r) = \frac{1}{2}u^r(\underline{A}, \lambda^R|\lambda_r) + \frac{1}{2}u^r(\overline{A}, \lambda^R|\lambda_r) - C$ if $A^L = \underline{A}$, where $u^r(., .|\lambda_r)$ is defined by (3.1).
[17]Where $\delta \equiv |\lambda^L - \lambda_r| - |\lambda^R - \lambda_r|$.

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Condition 3.

$$\alpha_r \kappa > \frac{2p+1}{3p}\delta + \frac{2(1-p)}{3p}C \tag{3.16}$$

The following proposition summarizes the results and displays the value of the ex-ante utility for the dictator from an appointment system under each scenario.

Proposition 7 (Dictator's Ex-ante Utility Appointment System) *Suppose assumptions A1, A2, A3, and A4 are satisfied.*

1. *If Condition 3 does not hold, the dictator appoints candidate R regardless of his signal. In this case, the ex-ante expected utility for the dictator from an appointment system is*

$$E\left(u^r\left(appoint|\lambda_r, \rceil C3\right)\right) = \frac{1}{2}\alpha_r\left(\overline{A} + \underline{A}\right) - |\lambda^R - \lambda_r| \tag{3.17}$$

2. *If Condition 3 holds, the dictator appoints candidate R if he receives signals $s \in \left\{\kappa, \underline{0}, \overline{0}\right\}$, whereas the dictator appoints candidate L if he receives signal $s = -\kappa$. In this case, the ex-ante expected utility for the dictator from an appointment system is*

$$E\left(u^r\left(appoint|\lambda_r, C3\right)\right) = \alpha_r\overline{A}\frac{p+2}{4} + \alpha_r\underline{A}\frac{2\text{-}p}{4} - |\lambda^R\text{-}\lambda_r|\frac{11\text{-}2p}{12} - |\lambda^L\text{-}\lambda_r|\frac{2p+1}{12} - C\frac{2(1\text{-}p)}{12} \tag{3.18}$$

Proof. See the Appendix.

The above proposition leads to a number of insights. First, if the dictator has a low valuation of competence relative to the costs of military intervention (condition 3 does not hold), the dictator finds it optimal to always appoint candidate R regardless of his signal. Notice, that since assumption 1 holds, the dictator would prefer a competent candidate L rather an incompetent R mayor. However, in this set of parameters the dictator does not find beneficial to appoint candidate L and face the risk of candidate L turning out to be incompetent. If instead condition 3 holds, the dictator is willing to appoint candidate L, but only if he receives signal that suggests candidate L is competent while R is incompetent.

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Finally, notice that in an appointment system there can be military interventions along the equilibrium path when condition 3 holds. This contrast with our findings from the election system in which, despite candidate L winning some of the times, the probability of military intervention converges to 0 as the size of the electorate goes to infinity. The reason for this relies on the differences in the accuracy of the information regarding the competence of politicians. In an elections system, if voters care enough about competence, information is efficiently aggregated, and as the size of the electorate goes to infinity, the final electoral result can be arbitrarily close to the perfect information outcome. In contrast, the dictator takes the appointment decision relying only on his private signal. If his valuation of competence is high enough, he will be willing to take the risky decision of appointing candidate L. However, with positive probability there will be ex-post intervention if candidate L turns out to be incompetent.

3.2.3   Comparison Appointment versus Election System

At the initial stage of the game, the dictator decides which system to choose for the selection of mayors. This decision is taken before nature selects the candidates for mayor or the electorate. The dictator chooses the method of selection that gives him the highest ex-ante expected utility. By comparing the ex-ante payoffs described of Propositions 6 and 7, we obtain the optimal decisions of the dictator in each scenario. Before describing the results I introduce an additional condition that determines whether the appointment or the election regime are preferred in one of the scenarios.

Condition 4

$$\alpha_r \kappa > \frac{5 - 2p}{3(1 - p)}\delta - \frac{1}{3}C$$

The following proposition summarizes the results.

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Proposition 8 (Elections vs. Appointment) *Suppose assumptions A1, A2, A3, and A4 are satisfied.*

    i.   *If condition C1 does not hold and C3 holds, the dictator chooses the appointment system.*

    ii.   *If neither condition C1 nor C3 hold, the dictator is indifferent.*

    iii.   *If condition C1 holds and C2 does not hold, the dictator chooses the election system.*

    iv.   *If condition C2, C3 hold, and C4 hold, the dictator chooses the election system.*

    v.   *If condition C2, C3 hold and C4 does not hold, the dictator chooses the appointment system.*

    iv.   *If C2 holds and C3 does not hold, the dictator chooses the election system.*

Proof. It follows by comparing the levels of the dictator's ex-ante utility given in Propositions 6 and 7.

Despite the large number of cases, the intuition behind this proposition is straightforward. First, if voters have a low valuation of competence or if they suffer high costs from military intervention (Condition 1 does not hold) the appointment system is always as good as elections. This is so because, in this set of parameters, most voters disregard their private signal and prefer the riskless scenario in which candidate R always wins. In this case elections do not aggregate information efficiently, since candidate R is elected regardless of his relative competence level. Since implementing this appointment strategy is always feasible for the dictator, the appointment regime will always perform at least as well as the election regime, from the point of view of the dictator.

If voters' valuation of competence and costs of intervention are intermediate (Condition 1 holds, Condition 2 does not) the dictator is always better-off under the election regime. The reason for this is the combination of three factors. First, elections enable an efficient aggregation of voters' private information, which in the aggregate leads to a more efficient screening mechanism of candidates' competence level. Second, the ex-post threat of military intervention makes voters reluctant to vote candidate L when they have the suspicion that he might be incompetent. This makes voter's ex-post preferences more aligned with the dictator than they would be in a fully democratic regime, which in turn makes the election system

more appealing to the dictator. And third, since Assumption 1 is satisfied, the dictator always prefers a competent L candidate than an incompetent R candidate. In this set of parameters, the dictator obtains his maximum payoff since candidate L is only elected if he is competent whereas his opponent is incompetent.

If voters' valuation of competence is high and cost of intervention are low (Condition 2 holds), whether the election regime is better than the appointment regime depends on condition 4. In this case, voters elect candidate L half of the times, and this generates a substantial ideological disutility to the dictator. Condition 4 captures the relative valuation of the dictator of ideological differences versus competence. If condition 3 does not hold, the dictator prefers the election system when Condition 2 also holds.

Finally, notice that when the dictator has a high valuation of competence (C3 holds), he would be strictly better-off if voters had an intermediate valuation of competence and costs of intervention. In particular, if the dictator could commit to set a given level of costs of military intervention of voters he would like to make it high enough so that voters only elect L if he is competent and R is incompetent, but not as high as to make candidate R win in all states of the world.

3.3   Extensions

3.3.1   Candidates' Entry Decisions

In the model presented in the previous section, candidates for mayor play a passive role: they are randomly selected by nature and then automatically become candidates for mayor. In this subsection I enrich the model by allowing candidates to decide whether to get into politics or not upon being selected by nature.

If a candidate for mayor decides to run and serves one term in office he obtains payoff G, which captures non-transferrable rents from office. If the candidate runs for office and he is not elected or appointed he obtains a payoff of 0. If the candidate takes office but he is violently removed from office he suffers a cost of φ. This cost can capture the disutility generated by the repression that is likely to follow a military intervention. For simplicity I assume that the mayor does not obtain the rents from office G if he is violently dismissed from office.

Candidates have some private information about the likelihood of being competent as a policymaker. In particular I assume that candidates know their competence level in the private sector, which is positively correlated with the competence as mayors. Let W denote the competence of a worker which has two possible values $\{\overline{W}, \underline{W}\}$ satisfying $\overline{W} > \underline{W} > 0$. The probability of having the same competence as worker than as mayor is $\pi > \frac{1}{2}$. The competence level in the private sector also represents the worker's outside option, i.e. the foregone earnings if he decides to get into politics.

The modified timing of events is the following:

1. The dictator chooses the selection method for the mayor: appointment or elections.

2. Nature chooses one potential candidate from each ideological group: λ^L and λ^R.

3. The selected candidates decide to get into politics or not. If they do not get into politics they return to their occupation as workers. If they get into politics they become official candidates for the election or appointment of mayor.

The rest of the timing of events (either if an appointment system or an election systems is chosen) is the same as before and it is omitted in the sake of brevity.

A worker that is randomly selected by nature decides to become an official candidate if his expected utility from getting into politics is higher than his payoff in the private sector. Since there are no military interventions along the equilibrium path in an election system with a large enough electorate, the decision of entry only depends on the rents from office and the opportunity costs of a political career. As long as the rents from office are high enough, both competent and incompetent workers are willing to get into politics. This is the case as long as the following assumption holds.

Assumption 5

$$G \geq 2\overline{W}$$

Under Assumption 5, the electoral results and ex-ante utility of the dictator is the same as summarized in Propositions 5 and 8.

In contrast, in an appointment system, the entry decision of L candidates also depends on the costs of repression, since military interventions take place along the equilibrium path. If

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the outside option of competent L workers is high enough relative to the costs of repression it is possible that they decide not to get into politics. Let us focus in the set of parameters in which competent L candidates do not find profitable to get into politics, but incompetent L candidates are willing to do so.

Assumption 6

$$G\frac{\pi\left(2p+1\right)}{6} - \varphi\frac{2\left(1-\pi\right)\left(1-p\right)}{6} < \overline{W}$$

Assumption 7

$$G\frac{\left(1-\pi\right)\left(2p+1\right)}{6} - \varphi\frac{2\pi\left(1-p\right)}{6} \geq \underline{W}$$

Focusing in this set of parameters allows us to explore additional potential inefficiencies of the appointment system relative to an election system. Similarly as before, it is optimal for the dictator to appoint candidate R upon receiving signals $s \in \left\{\kappa, \overline{0}, \underline{0}\right\}$ since this suggest that with high probability candidate R is at least as competent as candidate L. Whether the dictator appoints candidate R when receiving signal $s = -\kappa$ depends on the following condition:

Condition 5

$$\alpha_r\kappa > \frac{2\left(1-p\right)}{3p}\frac{\pi}{1-\pi}C + \frac{2p+1}{3p}\delta$$

When Condition 5 holds, the dictator is willing to appoint candidate L upon receiving signal $s = -\kappa$. The appointment strategies and ex-ante dictator's utility is similar as in the model without entry and the results are summarized in Proposition 11 in the Appendix.

Next, I compare the ex-ante payoff of the dictator in an elected versus an appointment system. In this decision, the dictator takes into account that each method of selection leads to a different composition of the pool of applicants that are willing to get into politics. Before describing the results I introduce an additional condition that determines whether the appointment or the election regime are preferred in one of the scenarios.

Condition 6

$$\alpha_r\kappa > \frac{\vartheta}{\omega}\delta - \frac{4\pi\left(1-p\right)}{\omega}C$$

where $\omega \equiv 3\left(1-2p+2p\pi\right)$ and $\vartheta \equiv 2\left(\pi+2-2p\left(1-\pi\right)\right)$

Proposition 9 (Election vs. Appointment with Entry) *Suppose assumptions A1, A2, A3, A4, A5, A6, and A7 hold.*

    i.   *If condition C1 does not hold and C5 holds, the dictator chooses the appointment system.*

    ii.   *If neither condition C1 nor C5 hold, the dictator is indifferent.*

    iii.   *If condition C1 holds and C2 does not hold, the dictator chooses the election system.*

    iv.   *If condition C2, C5, and C6 hold, the dictator chooses the election system.*

    v.   *If condition C2, C5 hold and C6 does not hold, the dictator chooses the appointment system.*

    vi.   *If C2 holds and C5 does not hold, the dictator chooses the election system.*

Proof. See the Appendix.

Notice that Proposition 9 leads to very similar results as Proposition 8. First, if voters have an insufficient valuation of competence (Condition 1 does not hold), the appointment system is at least as good as the election system from the point of view of the dictator. The intuition is the same as before: in this set of parameters voters are always appointing candidate R, which can always be replicated as an appointment strategy by the dictator. This corresponds to cases *i* and *ii*.

Second, if voters have an intermediate valuation of competence and intermediate costs of intervention (Condition 1 holds but Condition 2 does not), the election system is chosen: in this case, elections provide the dictator with the highest possible ex-ante utility.

The most important differences between the model with and without entry correspond to the remaining cases in which voters have a very high valuation of competence or very low costs of intervention (Condition 2 holds). Notice that since $\pi > \frac{1}{2}$, it is straightforward to see that Condition 5 is more restrictive than Condition 3. This means that in the model with entry, the set of parameters corresponding to case *vi* is larger, and so it is the number of cases in which elections are unambiguously preferred over an appointment system. In contrast, Condition 4 is more restrictive than Condition 6 and therefore among the set of parameters in which conditions 2 and 5 hold, case *iv* is more likely than case *v*.

To sum up, if the opportunity cost of getting into politics is high enough for competent

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workers, modelling the entry decision of candidates decreases the set of parameters in which the dictator prefers the appointment system over the election system. The intuition behind this result is the combination of two factors: first, the appointment system is a more noisy screening mechanism of competence than the election system, since the dictator bases his decision in a single signal. This implies that in the appointment system there can be military interventions along the equilibrium path. Second, in this set-up, competent workers might not be willing to get into politics in an appointment system, since they have a positive probability of being incompetent as policymakers and hence, of being violently removed from office. However this does not happen in an election regime because voters have a superior screening mechanism of competence which prevents the election of incompetent policymakers. In this sense, elections work as an insurance mechanism for competent workers: they will be more willing to get into politics because if they turned out to be incompetent policymakers they would not be violently removed from office, since in that case they would not have been elected in the first place. This better pool of candidates that are willing to get into politics makes the dictator prefer the election system over the appointment system for a larger set of parameters.

3.4 Discussion

During the last decade several studies have revealed that non-democratic regimes have developed an array of seemingly democratic institutions, such as elections and legislatures for different levels of government. We still know very little about what are the determinants of this heterogeneity in institutions and in the degree of decentralization of decision making that non-democratic regimes exhibit.

This paper focuses on local level institutions in non-democratic regimes. In particular, it explores one potential reason why an autocratic regime could find beneficial to hold local elections: the ability of elections to attract and select more competent local leaders. Usually citizens have private information about the competence level of local candidates and about the suitability of their platforms. Elections can provide a mechanism to aggregate this private information efficiently, leading to a more accurate screening mechanism of competence and policy platforms than the one a dictator in the central government can have. This is especially

the case in remote areas of the country.

However, it is not straightforward that an autocratic regime will always find beneficial to set an election system for the selection of local politicians. On the one hand, local elections might open the possibility of having some local leaders in office that have ideological differences with the dictator. On the other hand, local elections might fail to aggregate information efficiently in the context of a non-democratic regime, to the extent that voters might not be free to vote for their most preferred option.

In this paper I develop a theoretical framework to analyze the trade-offs involved in the decision of a dictator to allow local elections or set an appointment system. The model highlights that if voters have an intermediate valuation of competence relative to the costs of military intervention, the dictator prefers the election system over the appointment system. In this set of parameters, voters only select into office a dictator's opponent when he is substantially more competent than the dictator's crony. If instead voters' valuation of competence is low and voters' cost of intervention is very high, voters always elect the dictator's crony regardless of his competence level. In this case, the elections do not provide an efficient mechanism to aggregate private information because the presence of high costs of military intervention for voters prevents the contestation of local power. For this set of parameters the dictator weakly prefers the appointment system. If voters' valuation of competence is high and they incur in low costs in the event of military intervention, the opposition candidate is elected more often. As long as the dictator experiences enough disutility from ideological differences, he is better-off under an appointment system.

Hence, the model highlights that the presence of a threat of military intervention makes ex-post voters' preferences more aligned to those of the dictator than they would be in a fully democratic regime. However, the degree of alignment is non-monotonic in voters' costs of military intervention or in voters' valuation of competence: alignment is maximized when voters are somewhat constrained in their voting decisions, but not as much as to prevent real contestation of local power.

As an extension of the model, I explore whether the method of selection of local politicians can also affect the composition of the pool of candidates that are willing to get into politics. The model highlights that, under certain conditions, the election system leads to a pool of applicants

of higher average competence than the appointment system. Since elections are a better system of screening competence they become an insurance mechanism for candidates: even if they turn out to be incompetent as policymakers, they will not be dismissed from office in equilibrium, because they would not have been elected in the first place. This makes competent candidates more willing to get into politics in an election system than in an appointment system. This additional difference in the average quality of applicants makes the dictator prefer elections over appointment for a larger set of parameters, relative to the specification in which entry decisions are not modelled.

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3.5 Appendix

3.5.1 Voters' Expected Probabilities & Swing Voters

The expected utility of $v(\theta, \lambda_i)$ over the different states of the world when receiving signal $s = x$ is defined by:

$$E(v(\theta, \lambda_i)|s=x) = v(\theta=\kappa, \lambda_i)\Pr(\theta=\kappa|s=x) + v(\theta=\underline{0}, \lambda_i)\Pr(\theta=\underline{0}|s=x)$$

$$+v(\theta=\overline{0}, \lambda_i)\Pr(\theta=\overline{0}|s=x) + v(\theta=\kappa, \lambda_i)\Pr(\theta=\kappa|s=x)$$

Let δ_i denote the differences in the ideological distance of voter i from candidate R relative to candidate L i.e. $\delta_i \equiv |\lambda^L - \lambda_i| - |\lambda^R - \lambda_i|$. Then, by plugging in the values of function $v(\theta, \lambda_i)$ and the conditional probabilities we obtain the following expressions

$$
\begin{aligned}
E(v(\theta,\lambda_i)|s=\kappa) &= \tfrac{3p-1}{2}\alpha\kappa + \tfrac{2p+1}{3}\phi + \tfrac{2(1-p)}{3}\delta_i \\
E(v(\theta,\lambda_i)|s=\underline{0}) &= -\tfrac{2p+1}{6}\alpha\kappa + \tfrac{2p+1}{3}\phi + \tfrac{2(1-p)}{3}\delta_i \\
E(v(\theta,\lambda_i)|s=\overline{0}) &= -\tfrac{1-p}{3}\alpha\kappa \tfrac{2(1-p)}{3}\phi + \tfrac{2p+1}{3}\delta_i \\
E(v(\theta,\lambda_i)|s=-\kappa) &= -p\alpha\kappa + \tfrac{2(1-p)}{3}\phi + \tfrac{2p+1}{3}\delta_i
\end{aligned}
$$

By equating each of these conditional expectations to 0 we obtain expressions for the swing voters for each signal. Under Assumption 3 these thresholds lie in the interval $[\lambda^L, \lambda^R]$ and take the following forms

$$
\begin{aligned}
\lambda_{s=\kappa} &= -\tfrac{3(3p-1)}{8(1-p)}\alpha\kappa - \tfrac{2p+1}{4(1-p)}\phi + \tfrac{\lambda^R+\lambda^L}{2} \\
\lambda_{s=\underline{0}} &= \tfrac{2p+1}{8(1-p)}\alpha\kappa - \tfrac{2p+1}{4(1-p)}\phi + \tfrac{\lambda^R+\lambda^L}{2} \\
\lambda_{s=\overline{0}} &= \tfrac{1-p}{2(2p+1)}\alpha\kappa - \tfrac{1-p}{2p+1}\phi + \tfrac{\lambda^R+\lambda^L}{2} \\
\lambda_{s=-\kappa} &= \tfrac{3p}{2(2p+1)}\alpha\kappa - \tfrac{1-p}{2p+1}\phi + \tfrac{\lambda^R+\lambda^L}{2}
\end{aligned}
$$

3.5.2 Probabilities

The probabilities that a randomly drawn voter belongs to regions $h \in \{A, B, C, D, E\}$ take the following values:

$$
\begin{aligned}
P_A &= \psi\left(\lambda_{s=\kappa} - \tfrac{-1}{2\psi}\right) &&= \psi\left(\tfrac{-3(3p-1)}{8(1-p)}\alpha\kappa - \tfrac{2p+1}{4(1-p)}\phi + \tfrac{\lambda^R+\lambda^L}{2}\right) + \tfrac{1}{2} \\
P_B &= \psi\left(\lambda_{s=\underline{0}} - \lambda_{s=\kappa}\right) &&= \psi\tfrac{11p-2}{8(1-p)}\alpha\kappa \\
P_C &= \psi\left(\lambda_{s=\overline{0}} - \lambda_{s=\underline{0}}\right) &&= \psi\tfrac{3(4p-1)}{8(2p+1)(1-p)}(2\phi - \kappa) \\
P_D &= \psi\left(\lambda_{s=-\kappa} - \lambda_{s=\overline{0}}\right) &&= \psi\tfrac{4p-1}{2(2p+1)}\alpha\kappa \\
P_E &= \psi\left(\tfrac{1}{2\psi} - \lambda_{s=-\kappa}\right) &&= \tfrac{1}{2} - \psi\left(\tfrac{3p}{2(2p+1)}\alpha\kappa - \tfrac{1-p}{2p+1}\phi + \tfrac{\lambda^R+\lambda^L}{2}\right)
\end{aligned}
$$

Given the voting strategies associated with each region of the voter distribution, it is straightforward to see that the probability that a randomly drawn voter votes for candidate R in each state of the world is given by

$$
\begin{aligned}
q_{\theta=\kappa} &= pP_B + \tfrac{2p+1}{3}P_C + \tfrac{p+2}{3}P_D + P_E \\
q_{\theta=\underline{0}} &= \tfrac{1-p}{3}P_B + \tfrac{2p+1}{3}P_C + \tfrac{p+2}{3}P_D + P_E \\
q_{\theta=\overline{0}} &= \tfrac{1-p}{3}P_B + \tfrac{2(1-p)}{3}P_C + \tfrac{p+2}{3}P_D + P_E \\
q_{\theta=-\kappa} &= \tfrac{1-p}{3}P_B + \tfrac{2(1-p)}{3}P_C + (1-p)P_D + P_E
\end{aligned}
$$

By plugging in expression for probabilities P_h for $h \in \{A, B, C, D, E\}$, we obtain analytic expressions of $q_{\theta=x}$. Let us define: $\Psi \equiv \tfrac{\psi}{2(2p+1)}$, $\beta \equiv \tfrac{-5-2p+25p^2}{12}$; $\widetilde{\beta} \equiv \tfrac{-7-17p+19p^2}{12}$; $\widehat{\beta} \equiv \tfrac{-4-25p+38p^2}{12}$; $\overline{\beta} \equiv \tfrac{-8-7p-26p^2}{12}$; and $\mu \equiv \tfrac{3}{2}\left(1 - 2p + 4p^2\right)$.

$$
\begin{aligned}
q_{\theta=-\kappa} &= \Psi\tfrac{1}{1-p}\left[\beta\left(2p+1\right)\alpha\kappa + \mu\phi - (1\text{-}p)\left(2p+1\right)\left(\lambda^R+\lambda^L\right)\right] + \tfrac{1}{2} \\
q_{\theta=\overline{0}} &= \Psi\tfrac{1}{1-p}\left[\widetilde{\beta}\left(2p+1\right)\alpha\kappa + \mu\phi - (1\text{-}p)\left(2p+1\right)\left(\lambda^R+\lambda^L\right)\right] + \tfrac{1}{2} \\
q_{\theta=\underline{0}} &= \Psi\left[\widehat{\beta}\alpha\kappa + (2p+1)\left(\phi - \lambda^R - \lambda^L\right)\right] + \tfrac{1}{2} \\
q_{\theta=\kappa} &= \Psi\left[\overline{\beta}\alpha\kappa + (2p+1)\left(\phi - \lambda^R - \lambda^L\right)\right] + \tfrac{1}{2}
\end{aligned}
$$

3.5.3 Proof of Proposition 5 (Electoral Outcome)

First, notice that we can rewrite the probability $q_{\theta=\kappa}$ in the following way

$$
q_{\theta=\kappa} = \frac{4p-1}{3}P_B + q_{\theta=\underline{0}} = \frac{4p-1}{3}\left(P_B + P_C\right) + q_{\theta=\overline{0}} = \frac{4p-1}{3}\left(P_B + P_C + P_D\right) + q_{\theta=-\kappa}
$$

Therefore, as long as $p > \tfrac{1}{4}$ and Assumption 4 is satisfied we have $q_{\theta=\kappa} > q_{\theta=\underline{0}} > q_{\theta=\overline{0}} > q_{\theta=-\kappa}$. Second, Proposition 5 states that $q_{\theta=\overline{0}} = \Psi\tfrac{1}{1-p}\left[\widetilde{\beta}\left(2p+1\right)\alpha\kappa + \mu\phi - (1\text{-}p)\left(2p+1\right)\left(\lambda^R+\lambda^L\right)\right] + \tfrac{1}{2} > \tfrac{1}{2}$, where $\widetilde{\beta} \equiv \tfrac{-7-17p+19p^2}{12}$ and $\mu \equiv \tfrac{3}{2}\left(1 - 2p + 4p^2\right)$. This inequality simplifies to

$$
\underbrace{\widetilde{\beta}\left(2p+1\right)\alpha\kappa}_{\Omega} + \underbrace{\mu\phi - (1\text{-}p)\left(2p+1\right)\left(\lambda^R+\lambda^L\right)}_{\Pi} > 0
$$

Given that $\phi > \lambda^R+\lambda^L$, by assumption 4 and given that $\mu > (1\text{-}p)\left(2p+1\right)$ always holds, we have $\Pi > 0$. Similarly, $\Omega > 0$ is always satisfied for values of $p > \tfrac{1}{3}$. Given the stated assumptions, if Condition 1 does not hold, we have $\tfrac{1}{2} < q_{\theta=-\kappa} < q_{\theta=\overline{0}} < q_{\theta=\underline{0}} < q_{\theta=\kappa}$. If Condition 1 holds but

Condition 2 does not hold, we have $q_{\theta=-\kappa} < \frac{1}{2} < q_{\theta=\overline{0}} < q_{\theta=\underline{0}} < q_{\theta=\kappa}$. If Condition 2 holds, we have $q_{\theta=-\kappa} < q_{\theta=\overline{0}} < \frac{1}{2} < q_{\theta=\underline{0}} < q_{\theta=\kappa}$. The rest of results in Proposition 2 follow by applying the Condorcet Jury Theorem. QED.

3.5.4 Proof of Proposition 6 (Ex-ante Utility Election System)

Under the assumption that each state of the world is equally likely, the ex-ante expected utility for the dictator of holding elections is given by the following expression:

$$
\begin{aligned}
E\left(u^c\left(elect|\lambda_r\right)\right) = {}& \frac{1}{4}\alpha\overline{A}\left(2 + P^n_{\theta=\kappa} - P^n_{\theta=-\kappa}\right) + \frac{1}{4}\alpha\underline{A}\left(2 - P^n_{\theta=\kappa} + P^n_{\theta=-\kappa}\right) \\
& -|\lambda^R - \lambda_r|\frac{1}{4}\left(2 + P^n_{\theta=\overline{0}} + P^n_{\theta=-\kappa}\right) - |\lambda^L - \lambda_r|\frac{1}{4}\left(2 - P^n_{\theta=\overline{0}} - P^n_{\theta=-\kappa}\right) \\
& -C\frac{1}{4}\left[2 - P^n_{\theta=\underline{0}} - P^n_{\theta=\kappa}\right]
\end{aligned}
$$

Proposition 6 follows from computing the limit of the above expression, when the limit values of probabilities $P^n_{\theta=x}$ for $x \in \left\{\kappa, \underline{0}, \overline{0}, -\kappa\right\}$ are given in Proposition 5. QED.

3.5.5 Proof of Proposition 7 (Ex-ante Utility Appointment System)

The conditional expected value of $v^r(\theta, \lambda_r)$ over the different states of the world when receiving signal $s = x$ is defined in a similar way as in the case of voters. In particular it takes the following values:

$$
\begin{aligned}
E(v^r(\theta,\lambda_r)|s = \kappa) &= \frac{3p-1}{2}\alpha_r\kappa + \frac{2p+1}{3}C + \frac{2(1-p)}{3}(|\lambda^L\text{-}\lambda_r| - |\lambda^R\text{-}\lambda_r|) \\
E(v^r(\theta,\lambda_r)|s = \underline{0}) &= -\frac{2p+1}{6}\alpha_r\kappa + \frac{2p+1}{6}C + \frac{2(1-p)}{3}(|\lambda^L\text{-}\lambda_r| - |\lambda^R\text{-}\lambda_r|) \\
E(v^r(\theta,\lambda_r)|s = \overline{0}) &= \frac{(1-p)}{3}(2C - \alpha_r\kappa) + \frac{2p+1}{3}(|\lambda^L\text{-}\lambda_r| - |\lambda^R\text{-}\lambda_r|) \\
E(v^r(\theta,\lambda_r)|s = -\kappa) &= -p\alpha_r\kappa + \frac{2(1-p)}{3}C + \frac{2p+1}{3}(|\lambda^L\text{-}\lambda_r| - |\lambda^R\text{-}\lambda_r|)
\end{aligned}
$$

Naturally, the expected utility of appointing R relative to appointing L is higher, the more favorable is the signal received to candidate R:

$$
E(v^r(\theta,\lambda_r)|s = \kappa) > E(v^r(\theta,\lambda_r)|s = \underline{0}) > E(v^r(\theta,\lambda_r)|s = \overline{0}) > E(v^r(\theta,\lambda_r)|s = -\kappa)
$$

Notice that since Assumption 2 is satisfied and the dictator is ideologically closer to candidate R, the expected utility of the dictator when receiving signal $s = \overline{0}$ is always positive, i.e. $E(v^r(\theta, \lambda_r)|s = \overline{0}) \geq 0$. Therefore, the dictator appoints candidate R upon receiving signals $s \in \{\kappa, \underline{0}, \overline{0}\}$. If condition 3 holds, we have $E(v^r(\theta, \lambda_r)|s = -\kappa) < 0$ which means that the dictator finds it optimal to appoint L upon receiving signal $s = -\kappa$, whereas the dictator appoints candidate R if condition 3 does not hold.

Let $\sigma(s)$ denote these optimal appointment strategies and let $V^r(\theta|\lambda_r, \sigma(s))$ denote the utility for the dictator of following strategy $\sigma(s)$ when state of the world is θ. The ex-ante expected utility of the dictator from an appointment regime is given by the following expression

$$E\left(u^r\left(appoint|\lambda_r, \sigma(s)\right)\right) = \sum_{x \in \{\kappa, \underline{0}, \overline{0}, -\kappa\}} \Pr\left(\theta = x\right) \sum_{h \in \{\kappa, \underline{0}, \overline{0}, -\kappa\}} \Pr\left(s = h|\theta = x\right) V^r(x|\lambda_r, \sigma(h))$$

By plugging in the described appointment strategies, dictator's payoffs and conditional probabilities in the above expression we obtain the values of the expected utility as in Proposition 7. QED.

3.5.6 Proof of Proposition 9 (Election versus Appointment with Entry)

First, we define the participation constraints of candidates in the two alternative methods of selection. A worker that is randomly selected by nature decides to become an official candidate if his expected utility from getting into politics is higher than his payoff in the private sector. For a worker from ideological group L, this will be the case if the following condition holds:

$$\sum_{x \in \{\kappa, \underline{0}, \overline{0}, -\kappa\}} \Pr\left(\theta = x|W_j^L\right) \Pr\left(L \ selected \mid \theta = x\right) \left[G\mathbf{1}_{x \in \{\overline{0}, -\kappa\}} - \varphi\mathbf{1}_{x \in \{\kappa, \underline{0}\}}\right] \geq W_j^L$$

where $W_j^L \in \{\overline{W}, \underline{W}\}$, $\Pr\left(L \ selected \mid \theta = x\right)$ is the probability that candidate L is selected which depends on the method of selection and on the set of parameters. Notice that the possible payoffs also depend on the state of the world, since candidate L obtains a negative payoff if he turns out to be incompetent.

A potential candidate from ideological group R will get into politics if:

$$\sum_{x \in \{\kappa, \underline{0}, \overline{0}, -\kappa\}} \Pr\left(\theta = x | W_j^R\right) \Pr\left(R \text{ selected} \mid \theta = x\right) G \geq W_j^R$$

where $W_j^R \in \{\overline{W}, \underline{W}\}$.

Notice that the more competent is the worker, the higher is his outside option in the private sector. However, more competent workers also have a higher probability of being competent mayors and hence more likely of being selected and able to serve a term. The magnitude of these two factors determines whether a competent or incompetent worker is more likely to get into politics.

The conditional probabilities for state of the world $\theta = \kappa$ are $\Pr\left(\theta = \kappa | \overline{W}^R\right) = \Pr\left(\theta = \kappa | \underline{W}^L\right) = \frac{\pi}{2}$ and $\Pr\left(\theta = \kappa | \underline{W}^R\right) = \Pr\left(\theta = \kappa | \overline{W}^L\right) = \frac{1-\pi}{2}$. Conditional probabilities for $\Pr\left(\theta = x | W_j\right)$ $x \in \{\underline{0}, \overline{0}, -\kappa\}$ are defined similarly.

Next, I specify the entry conditions for each type of potential candidate under an election system when the probabilities of each candidate winning are given by (3.10).

A worker from ideological group L and with competence level $W_j^L \in \{\overline{W}, \underline{W}\}$ decides to get into politics if the following condition holds:

$$G\frac{\pi}{2}\left(2 - P_{\theta=\overline{0}}^n - P_{\theta=-\kappa}^n\right) - \varphi\frac{1-\pi}{2}\left(2 - P_{\theta=\kappa}^n - P_{\theta=\underline{0}}^n\right) \geq W_j^L \tag{3.19}$$

A worker from ideological group R and with competence level $W_j^R \in \{\overline{W}, \underline{W}\}$ decides to get into politics if the following condition holds:

$$G\left[\frac{\pi}{2}\left(P_{\theta=\kappa}^n + P_{\theta=\overline{0}}^n\right) + \frac{1-\pi}{2}\left(P_{\theta=\underline{0}}^n + P_{\theta=-\kappa}^n\right)\right] \geq W_j^R \tag{3.20}$$

Notice that competent workers have a higher outside option. However they are also more likely to be elected. The magnitude of these two effects determines which type of worker is more likely to get into politics. By plugging in the expressions above the probabilities of each possible electoral outcome described in Proposition 5, we can verify whether it is incentive compatible for candidates to get into politics. It is straightforward to see that if Condition 1 does not hold, workers from ideology L do not find profitable to get into politics since their

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probability of winning an election is arbitrarily close to 0 (the right hand side of (3.19) is 0). However, this does not affect the electoral outcome or the ex-ante utility of the dictator. Under Assumption 5, all candidates get into politics in an election system. Notice that this assumption does not depend on the costs for elected mayors of suffering a military intervention, φ. This is so because for the set of parameters we are focusing on, there are no military interventions when the electorate is large enough: candidate L only has significant chances of winning if he is competent. The following proposition summarizes these results.

Proposition 10 (Electoral Outcome with Entry) *Suppose A1, A2, A3, A4, A5, and A6 hold. Then, the electoral outcome is the same as described in Proposition 5 and the ex-ante utility for the dictator is given by Proposition 6.*

Proof. As mentioned in the text, it is straightforward to see that if Condition 1 does not hold, workers from ideological group L do not get into politics. Workers from ideological group R get into politics if $G > \overline{W}$ for competent workers and $G > \underline{W}$ for incompetent workers. For the rest of parameters the following are workers participation constraints.

If Condition 1 holds but Condition 2 does not hold, participation constraints are:

$$\overline{W}^L : \quad \tfrac{\pi}{2}G \geq \overline{W}$$

$$\underline{W}^L : \quad \tfrac{1-\pi}{2}G \geq \underline{W}$$

$$\overline{W}^R : \quad \tfrac{1+\pi}{2}G \geq \overline{W}$$

$$\underline{W}^R : \quad \tfrac{2-\pi}{2}G \geq \underline{W}$$

If Condition 2 holds, participation constraints are:

$$\overline{W}^L : \quad \pi G \geq \overline{W}$$

$$\underline{W}^L : \quad (1-\pi)G \geq \underline{W}$$

$$\overline{W}^R : \quad \tfrac{1}{2}G \geq \overline{W}$$

$$\underline{W}^R : \quad \tfrac{1}{2}G \geq \underline{W}$$

Therefore as long as Assumption 5 holds $(G \geq 2\overline{W})$ all the participation constraints are satisfied when Condition 1 does not hold. In this case the electoral outcome is identical to the game with no entry since voters have the same pool of applicants. If Condition 1 holds only

candidate R workers get into politics. However, since candidates from group L were not elected even if they got into politics, the electoral outcome remains unaffected. The remaining of this proof is equivalent to the one in Propositions 5 and 6, and it is therefore omitted. QED.

Therefore, as long as the four types of candidates decide to get into politics when Condition 1 holds, the dictator obtains the same ex-ante payoffs as before.

In an appointment system, similarly as before, when condition C5 does not hold the participation constraints of L candidates are not satisfied: since they are never appointed, they have no incentive to get into politics and forego their private sector earnings.

If Condition 5 holds, candidate L is appointed if the dictator receives signal $s = -\kappa$. Notice that contrary to what happens in an election regime with a large enough electorate, in an appointment system workers with ideology L face the risk of being violently removed from office. Even though citizens have private information about their competence in the private sector, there is uncertainty about how competent they are going to be as policymakers. This can make them reluctant to get into politics, specially if they have a good outside option. Under Assumptions 6 and 7 we focus our attention to the set of parameters in which incompetent workers get into politics but incompetent workers do not. Notice that these assumptions can simultaneously hold if the difference between $\overline{W}$ and $\underline{W}$ is high enough and as long as the costs for mayors of military intervention, φ, take intermediate values.

Similarly as before, it is optimal for the dictator appoints candidate R upon receiving signals $s \in \{\kappa, \overline{0}, \underline{0}\}$ since this suggest that with high probability candidate R is at least as competent as candidate L. When Condition 5 holds, the dictator is willing to appoint candidate L upon receiving signal $s = -\kappa$. The following proposition summarizes the results of the appointment system allowing for entry decision of politicians.

Proposition 11 (Appointment Outcome with Entry) *Suppose assumptions A1, A2, A3, A4, A5, A6, and A7 are satisfied.*

1. *If Condition 5 does not hold, the dictator appoints candidate R regardless of his signal. In this case, the ex-ante expected utility for the dictator from an appointment system is*

$$E\left(u^r\left(app|\lambda_r, \rceil C5\right)\right) = \frac{1}{2}\alpha_r\left(\overline{A} + \underline{A}\right) - |\lambda^R - \lambda_r| \tag{3.21}$$

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2. *If Condition 5 holds, the dictator appoints candidate R if he receives signals $s \in \{\kappa, \underline{0}, \overline{0}\}$,*
   whereas the dictator appoints candidate L if he receives signal $s = -\kappa$. In this case, the
   ex-ante expected utility for the dictator from an appointment system is

$$E\left(u^r\left(app|\lambda_r, C5\right)\right) = \alpha_r \overline{A} \frac{1+p\text{-}p\pi}{2} + \alpha_r \underline{A} \frac{1-p+p\pi}{2} - |\lambda^R\text{-}\lambda_r| \frac{5+\chi}{6} - |\lambda^L\text{-}\lambda_r| \frac{1+\chi}{6} - C \frac{2\pi(1\text{-}p)}{6}$$

$$(3.22)$$

where $\chi \equiv (1\text{-}\pi)(2p+1)$.

Proof.

$$\overline{W}^L : \quad G\frac{\pi(2p+1)}{6} - \varphi\frac{2(1-\pi)(1-p)}{6} \geq \overline{W}$$

$$\underline{W}^L : \quad G\frac{(1-\pi)(2p+1)}{6} - \varphi\frac{2\pi(1-p)}{6} \geq \underline{W}$$

$$\overline{W}^R : \quad G \geq \frac{6}{7-p-2\pi-\pi p}\overline{W}$$

$$\underline{W}^R : \quad G \geq \frac{6}{4\pi p-\pi-2p+5}\underline{W}$$

Under Assumptions 6 and 7 the pool of candidates for mayor is different than in the appointment system with no entry. This affects the likelihood of the different states of the world since it is less likely that a candidate L that runs into politics turns out to be a competent policymaker. In particular the probability of each state of the world are $\Pr(\theta = \kappa) = \Pr(\theta = \underline{0}) = \frac{\pi}{2}$, $\Pr(\theta = \overline{0}) = \Pr(\theta = -\kappa) = \frac{1-\pi}{2}$. This in turn affects the posterior probability distribution of the dictator upon observing different signals. Conditional expected values of $v^r(\theta, \lambda_r)$ when receiving signal $s = x$ take the following expressions:

$$E(v^r(\theta, \lambda_r)|s = \kappa) \quad = \quad \xi\left[\frac{2p\pi+2p+\pi-2}{2}\alpha_r\kappa + (2p+1)\pi C + 2(1\text{-}p)(1\text{-}\pi)\left(|\lambda^L\text{-}\lambda_r| - |\lambda^R\text{-}\lambda_r|\right)\right]$$

$$E(v^r(\theta, \lambda_r)|s = \underline{0}) \quad = \quad \xi\left[\frac{-6\pi p+3\pi+2p-2}{2}\alpha_r\kappa + (2p+1)\pi C + 2(1\text{-}p)(1\text{-}\pi)\left(|\lambda^L\text{-}\lambda_r| - |\lambda^R\text{-}\lambda_r|\right)\right]$$

$$E(v^r(\theta, \lambda_r)|s = \overline{0}) \quad = \quad \eta\left[-(1\text{-}p)(1\text{-}\pi)\alpha_r\kappa + 2\pi(1\text{-}p)C + (2p+1)(1\text{-}\pi)\left(|\lambda^L - \lambda_r| - |\lambda^R - \lambda_r|\right)\right]$$

$$E(v^r(\theta, \lambda_r)|s = -\kappa) \quad = \quad \eta\left[-3p(1\text{-}\pi)\alpha_r\kappa + 2\pi(1\text{-}p)C + (2p+1)(1\text{-}\pi)\left(|\lambda^L - \lambda_r| - |\lambda^R - \lambda_r|\right)\right]$$

where $\xi \equiv \frac{1}{2-\pi-2p+4p\pi}$ and $\eta \equiv \frac{1}{2p+1+\pi-4\pi p}$.

Given the above assumptions we have

$$E(v^r(\theta, \lambda_r)|s = \kappa) > E(v^r(\theta, \lambda_r)|s = \underline{0}) > E(v^r(\theta, \lambda_r)|s = \overline{0}) > E(v^r(\theta, \lambda_r)|s = -\kappa)$$

By assumption 2, we have $E(v^r(\theta, \lambda_r)|s = \overline{0}) > 0$ which implies that the dictator always appoints candidate R upon receiving signals $s \in \{\kappa, \underline{0}, \overline{0}\}$. $E(v^r(\theta, \lambda_r)|s = -\kappa)$ takes negative values when Condition 5 holds, in which case the dictator appoints candidate L upon receiving signal $s = -\kappa$. By using these appointment strategies and plugging in the new probability distribution over states of the world we obtain the expressions for the ex-ante expected utility of the mayor given by (3.21) and (3.22). QED.

Finally by comparing the levels of the ex-ante utility of the dictator in Propositions 10 and 11, we obtain the results displayed in Proposition 9. QED.