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Abstract

We investigate the links between capital cities, conflict, and the quality of governance, starting from the assumption that incumbent elites are constrained by the threat of insurrection, and that the latter is rendered less effective by distance from the seat of political power. We show evidence for two key predictions: (i) conflict is more likely to emerge (and dislodge incumbents) closer to the capital, and (ii) isolated capitals are associated with misgovernance. The predictions hold only for relatively non-democratic countries, and for intrastate conflicts over government (as opposed to territory) – exactly the cases where our central assumption should apply.

Keywords: Capital Cities; Governance; Institutions; Conflict; Civil War; Revolutions; Insurgencies; Population Concentration; Democracy; Power Sharing; Inefficient Institutions.

JEL Classification: D02, D74, O18, R12

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1 Introduction

Conflict and the quality of governance matter greatly for development, and they are tightly linked. It is an established fact that conflict festers in poorly governed countries, with causality potentially going both ways (Collier et al 2003). Moreover, many have noted that the threat of insurrection and conflict can play a crucial role in the emergence of good governance.[1] In fact, this threat is an importance source of constraints over rulers and elites, limiting their ability to appropriate the apparatus of government to their own benefit. It looms especially large when there are relatively few explicit, formally established checks and balances, such as those imposed by a well-functioning democratic process through which incumbents might be held accountable.

This paper studies one specific, relatively understudied element that affects this interplay between governance and the threat of conflict: the spatial distribution of a country's population relative to the seat of political power. We start off with the recognition, motivated by the historical evidence, that capital cities have often played a pivotal role in determining the outcome of insurgencies and revolutionary standoffs – and that incumbents react to the incentives posed by this role. It is then natural to ask about its implications for the quality of governance.

We first develop a model to shed light on these questions. We study an incumbent elite that can extract rents, but is subject to the threat of rebellions from dissatisfied citizens. Our key assumption is that rebellions are more effective when they take place closer to the capital city. This embodies the principle that "spatial proximity to power increases political influence" (Ades and Glaeser 1995, p.198), and especially so when that influence is mediated by the threat of violence.

Our first central result is that conflict is more likely to emerge closer to the capital city. Relatedly, we also find that conflict is more likely to dislodge the incumbent regime when it happens close to the capital. Intuitively, it is cheaper for incumbents to obtain a given amount of stability by buying off those who live far away: they can be placated with less, because they represent a lesser threat. Incumbents are thus willing to live with a greater probability of conflict nearby, in spite of the greater danger it entails.

We then extend the model to consider the endogenous choices of the degree of isolation of the capital city and of the quality of governance.[2] This yields our second key result: isolated capitals are associated with misgovernance. This reflects causality going in both directions. On the one hand, a more isolated capital induces worse governance: when incumbent elites are more protected against the threat of rebellion, they can extract rents more easily, and have less incentive to share power and rents. On the other hand, bad governance increases the incentive to isolate the capital, because incumbents in a less productive economy will worry less about the losses induced by that additional isolation.

[1] On the emergence of institutions as a result of latent social conflict and (the threat of) violence, see Acemoglu and Robinson (2005), Besley and Persson (2009), Bueno de Mesquita and Smith (2009), or Guimaraes and Sheedy (2015).

[2] We take the choice of location of the capital city as a short-hand description for all the policy levers that affect the spatial distribution of individuals relative to the capital city, of which actually relocating the capital is just a relatively extreme example – though, as we will see, not that infrequently used or contemplated – alongside migration policies, specific economic incentives to populate certain areas, and so forth.

The empirical evidence is very much consistent with our key predictions. We first look at worldwide geolocated data on the onset and prevalence of conflict. We show that intrastate conflict is more likely to start and to occur in places that are closer to the capital city, controlling for income, population, and a number of geographical variables (including broad measures of isolation unrelated to the capital city). Using the panel variation, and changes in country borders and capital city moves – arguably exogenous with respect to local characteristics – as the source of identification, we also find that, for a given place, conflict becomes more likely when the capital is moved closer to that place. Finally, we show that moving the capital closer to a given place increases the likelihood that the onset of conflict in that location will be associated with regime change.

Reassuringly, these empirical patterns hold only in contexts where we would expect the forces we focus on to be most important. First, they are present only in relatively non-democratic countries, where the threat of conflict should be more salient as a constraint on rulers. Second, we find no link between distance to the capital and the types of conflict to which our logic should not apply. In particular, that is the case for interstate conflicts, and for "territorial" intrastate conflicts – namely, those where the main claimed incompatibility regards territory (e.g. separatist insurgencies), as opposed to who gets to control the government. Our findings are also pointedly inconsistent with what one might have expected from alternative explanations: for instance, if the link were driven purely by weak state capacity, it would stand to reason that conflict would be more likely farther from the capital, as the reach of the state grows feebler. Similarly, we would expect no difference with respect to territorial conflict.

We then look at the link between capital cities and governance. We find robust evidence that isolated capitals are indeed associated with misgovernance, controlling for a number of standard correlates of quality of governance and isolation of the capital, and using different ways of measuring these concepts.

Other pieces of evidence reinforce our confidence that this correlation indeed captures the operation of the forces we highlight. First, the correlation is again present only for relatively non-democratic countries. Second, when we unpack the definition of governance, we see that in fact the autocracies with isolated capitals have governments that are less effective, less accountable, more corrupt, and less able or willing to sustain the rule of law; however, they are not more unstable. This is consistent with the logic of our model, which postulates that isolation is a way of protecting against the threat of removal. Neither is there any correlation between isolated capitals and measures of government performance that are unrelated to the kind of institutional incentives our framework highlights, again suggesting that our stylized fact is unlikely to be driven by some unrelated link between isolated capitals and lack of state capacity.

Similarly, we find evidence that the correlation is indeed about the role of the capital city: controlling for the isolation of the country's largest city other than the capital leaves results unaffected. Along with the evidence on conflict, this is reassuring against the possibility that isolation from the capital might have been proxying for factors related to the state's ability to supply a high-quality institutional infrastructure to relatively isolated places. We also find direct evidence that isolated capital cities are associated with less power sharing, as captured by constraints on executive power and by the extent of political competition. Finally, we find evidence – again, only for the sample of relatively non-democratic countries – for the model's ancillary testable predictions: the isolation of the capital city is positively correlated with the income per capita in the capital (relative to the country as a whole), and negatively related with military spending (which could be used as an alternative source of protection).

This paper relates to a range of different strands of literature. It fits directly into the one that stresses the political implications of spatial distributions, both in economics (e.g. Ades and Glaeser 1995, Davis and Henderson 2003) and in political science (e.g. Rodden 2010). In fact, the importance of the spatial distribution of population and its connection with the threat of rebellion facing rulers has long been recognized by an important group: rulers themselves. As we discuss in detail later, the history of decisions on where to locate capital cities suggests that protection against perceived instability threat is a pervasive concern behind capital relocations, either planned or actually implemented.

We emphasize the special role of the capital city, and in that we are closely related to Campante and Do (2014). That paper looks at how the spatial distribution of population and the isolation of capital cities affect government performance across US states, by conditioning the degree of accountability provided by the news media and the electoral process. We look here at a very different mechanism, related to the threat of conflict, which we show to be in force in a very different, non-democratic context.[3] Another crucial distinction is that, while that paper points at a direction of causality running from the isolation of the capital to governance, we argue here that the reverse direction is just as important in the case of weakly institutionalized polities, as incumbents have considerably more influence in affecting the spatial distribution of population relative to the capital.[4]

We contribute to the voluminous literature on intrastate conflict and civil wars (see Blattman and Miguel 2010 for a survey). Our focus is on one of the possible motivations for conflict, namely attempts to bring down an incumbent regime, and even more narrowly, on its spatial dimensions. Still, we relate directly to the strand within that literature that considers the role of geographic and demographic factors (e.g. Fearon and Laitin 2003), and in doing so we address several of the aspects highlighted by Sambanis (2005) as in need of empirical exploration: distinctions between established democracies and more fragile

[3]While that paper's results seem in tension with our finding of an absence of a link between the degree of isolation and governance in established democracies, they can be reconciled quite naturally: as much as there is a real difference between the extent of corruption in, say, Minnesota and Louisiana, this is evidently swamped by the variation across countries. It is not surprising that the cross-country evidence is painted with strokes that are too broad to detect the effect of the subtler mechanisms that are in play in established democracies, and which we leave aside here.

[4]This two-way feedback underscores the difficulty of empirically disentangling causality running one way or the other. In particular, it is hard to think of sources of exogenous variation, at the cross-country level, that affect isolation without affecting governance. The source of exogenous variation used by Campante and Do (2014) – the location of a state's centroid – is unfortunately not relevant in the context of the countries we focus on: the equanimous, republican logic of locating the capital at a relatively central position, which underlies the first-stage relationship accross US states, was bound to be much less influential to the decisions of autocrats and/or colonial powers concerning the designation of the capital. As noted by Herbst (2000, p. 16), with respect to Africa, "[most] colonial capitals were located on the coast, demonstrating the low priority of extending power inland compared to the need for easy communication and transport links with Europe." These capitals by and large persisted as such after independence. Unsurprisingly, there is no correlation between the isolation of the capital city and the isolation of the centroid within our sample of autocracies.

environments, geographic concentration of power, or the degree of state control over a country's geographic periphery. As we have argued, our results go against the more standard presumption that isolated areas are more prone to conflict, further illustrating the value of considering the special role of capital cities, and of differentiating between different types of conflict.[5]

We also build on the literature on the endogenous emergence of institutions, and their implications for development. In particular, we address the broad question of the persistence of inefficient institutions (e.g. Acemoglu 2006, Guimaraes and Sheedy 2015). We identify the spatial distribution of individuals as a novel source of variation in the constraints that underpin institutional choices, which may leave agents who stand to benefit from those inefficient institutions better able to get away with their preferences. We are also close to the recent strand of that literature that has tried to unpack the evolution of political institutions along different dimensions, such as checks and balances, power sharing, and political stability (e.g. Besley, Persson, and Reynal-Querol 2014). We provide further support for the view that these can interact in subtle ways, and move in separate directions as a result.

Last but not least, we relate to a literature on how the isolation of countries or their geographical size affects institutions and development – such as Nunn and Puga (2012) and Ashraf, Galor and Ozak (2010). They do not deal with the specific institutional role of the capital city and its isolation. On a different vein, Stasavage (2010) emphasizes how geographical distances from European capital cities might have hindered the historical development of representative institutions through reduced accountability, though his historical data do not allow for consideration of the spatial distribution of population.

The paper is organized as follows: Section 2 discusses some motivating historical evidence; Section 3 presents the model; Section 4 discusses the empirical evidence; and Section 5 concludes.

2 Revolutions and Capital Cities

Physical proximity to the stronghold of government matters critically when it comes to removing it by force: a relatively small mob in the capital city poses as much of a threat as a much larger group of rebels elsewhere. It follows that the population in and around the capital is especially important in these contexts, as can be illustrated by a brief look at a few revolutionary episodes over the past three centuries.

A classic example is the transition century from the Ancien Régime to the Third Republic, in France. Around the time of the French Revolution, the 550 thousand people living in Paris certainly did not represent the average or median opinion of some 29 million Frenchmen, among which many royalists willing to defend the monarchy.[6] While turmoil in the countryside was certainly important leading up and in the aftermath of the Revolution (Markoff 1996), the Parisian crowd packed a far heavier revolutionary punch,

[5]For instance, Buhaug and Rod (2006) find evidence, using African data, that separatist conflict is more likely in isolated areas near national borders, and farther from the capital, where control by the central government is weaker. In contrast, Besley and Reynal-Querol (2014) find that conflict in Africa is more likely closer to the capital city, in line with our results.

[6]National and city population figures come from estimates of McEvedy and Jones (1978), and from Braudel (1986), who observed that France at the end of the Ancien Régime was still very much a rural country. Later on, royalist counter-revolutionaries rioted in Brittany, La Vandée and Dauphiné, regions too far from Paris to make any difference.

as described by Tilly (2003 p. 162-167), than those anywhere else. As put by Traugott (1995, p.148) in his analysis of French insurrections during the following century: "as Paris goes, so goes the nation."

In fact, the Parisian streets witnessed considerably more intense and consequential revolutionary action than other places, as can be seen from the historical evidence on barricade episodes in 19th-century France. Table 1, compiled from Traugott (2010), shows that Paris had more episodes, which tended to last longer and be of greater magnitude than elsewhere.

Table 1: Independent Barricade Episodes in France, 1789-1900

	Observations	Mean	S.D.	Min	Max
			Paris		
Magnitude	19	9.5	6	4	24
Duration	18	2.8	2.8	1	13
			Rest of France		
Magnitude	9	6.8	4.2	3	15
Duration	8	1.6	0.5	1	2

Source: Traugot (2010). The table considers all "independent" events (namely, those not triggered by episodes occurring elsewhere) between 1789 (excluded) and 1900. "Magnitude" is the sum of the codes for "Number of Insurgents" (1 = 1 to 99; 2 = 100 to 999; 3 = 1000 to 9999; 4 = 10000 and up), "Number of Insurgent Deaths" (0 = none; 1 = 1 to 9; 2 = 10 to 99; 3 = 100 to 999; 4 = 1000 and up), and "Number of Barricades" (2 = 1 to 9; 4 = 10 to 99; 8 = 100 to 999; 16 = 1000 and up). Duration is measured in days.

The logic linking revolutions and capital cities is by no means limited to 18th- and 19th-century France, of course. As put by *The Economist*, in the context of the 2006 "Orange Revolution" in the Ukraine – and as was repeated in the same country in 2014 – "during a [revolutionary] stand-off, the capital city is crucial."(March 18th 2006, p. 28) The lingering political turmoil in Thailand, in recent years, is another example of how hard it is for a government to stay in power if it lacks support from the population of the capital city, even when such government was largely popular elsewhere in the country (*The Economist*, Sep. 22nd, 2006). By the same token, incumbent regimes are obviously especially concerned with securing the capital city when the threat of rebellion becomes acute (e.g. Arriola 2013 on the case of Ethiopia).

The importance of the capital is underscored by the many incumbent rulers who have tried to manipulate the concentration of population around the capital by moving the latter. More often than not, alleviating revolutionary pressure was one of the explicit or barely concealed goals behind those moves.

Examples from history abound. In the 17th century, Louis XIV moved away from the masses into the tranquility of Versailles, a move motivated by his dislike of Paris, stemming from the rebellions against the Crown he suffered durig his youth, and by his desire to "not again allow the Paris populace [...] to threaten the French monarchy." (Kirkland 2013, p.4) Modern examples are also easy to come by, and many other countries have fiddled with the idea, even if falling short of carrying it through. In just about every case, a chief concern was to have the new capitals to be "quiet, orderly places where civil servants could get on with their jobs without distraction."(*The Economist*, Dec. 18th 1997)

Looking closely at a couple of these modern examples helps illuminate that logic. Brazil moved the capital in 1960 from Rio de Janeiro to Brasília – many hundreds of kilometers away from the main population centers of Rio de Janeiro and São Paulo, and far from the coast, where most of the country's population was and still is. As Couto (2001) remarks, one of the factors motivating the president who decided to build the new capital from scratch, Juscelino Kubitschek, was a desire to escape from the atmosphere of political agitation in Rio, where the president was more exposed to political crises and student demonstrations. As he himself put it, rather colorfully: "A tramway strike in Rio de Janeiro may bring down the President of the Republic." (Couto, 2001, p. 199, our translation)

The recent move in Myanmar (Burma), in 2005, from the major population center of Yangon (Rangoon) to the fortified "secret mountain compound" of Naypyidaw is another illuminating, if somewhat extreme example (*International Herald Tribune*, Nov 11th 2005). It has been noted that the new capital seems to have been designed to further isolation and minimize the possibilities of urban upheaval (Varadarajan 2007). As if to emphasize this design, the city was deliberately planned without mobile phone coverage, and civil servants were not allowed to take their spouses or children along when they originally moved (Htay 2007). These are measures that are hard to justify under the oft-mentioned rationales of developing an underpopulated part of the country or protecting against foreign invasion.

This pattern can be seen more systematically with the help of Table 2. This table lists all instances in which capital cities were moved, on a permanent basis, by formally independent countries since World War I, with the corresponding distances and population numbers.[7] These are not rare episodes: on average, capital moves happen once every six years, and there are examples from every continent. Most importantly from our standpoint, the moves are overwhelmingly in the direction of greater isolation, at least under the rough measure of capital primacy (share of population in the capital city). This pattern might have been expected, since the capital is typically the largest city in the country, but it is striking that the typical new capital is a lot smaller than the old one – often built from scratch.

The relatively extreme policy lever of picking or influencing the location of the capital city is useful to illustrate the point, but we should stress that many other levers are available. For instance, incumbents can try to placate discontent arising in the capital, or otherwise influence the distribution of population around the capital – say, with special incentives or coercion towards populating certain areas of the country, or with restrictions on domestic migration. [8]

[7]Sources are listed in the online Data Appendix. Population numbers are for as close to the event as could be found. Exceptions involving temporary moves, or moves within a 10km radius are listed in the notes below the table.

[8] Stark examples of such policies are not hard to come by either: from relatively benign registration systems that restrict internal migration – such as the Chinese *hukou* or the Vietnamese *hô khâu* – to more extreme cases such as the mass deportation of ethnic groups and the confinement of dissidents to remote areas in the Soviet Union, or the forced depopulation of cities during the reign of the Khmer Rouge in Cambodia. As with capital city moves, these are all policies that are not motivated solely by a desire to isolate the capital, but it is telling that one can hardly find examples of such regimes encouraging their populations to move closer. It is just as telling that they often specifically target groups considered particularly dangerous in terms of kindling insurgencies, such as disgruntled minorities or students. On the latter group, there have been many

Table 2: Changes in Capital Cities since World War I

Country	From	To	Year	Distance (km)	Population (From)	Population (To)
Russia	St. Petersburg	Moscow	1918	633	2.3 million (1917)	1.8 million (1915)
Turkey	Istanbul	Ankara	1923	351	680K (1927)	75K (1927)
Australia	Melbourne	Canberra	1927	472	670K (1914)	-
China	Nanjing	Beijing	1949	1219	2.8 million (1955)	2.8 million (1953)
Mauritania	-	Nouakchott	1957	-	-	200 (1957)
Brazil	Rio de Janeiro	Brasilia	1960	754	3.1 million (1960)	-
Rwanda	Butare	Kigali	1962	80	n.a.	6K (1962)
North Yemen	Ta'izz	Sana'a	1962	198	87K (1975)	135K (1975)
Pakistan	Karachi	Islamabad	1966	1144	1.9 million (1961)	-
Malawi	Zomba	Lilongwe	1974	227	24K (1977)	99K (1977)
Cote d'Ivoire	Abidjan	Yamoussoukro	1983	228	1.2 million (1978)	200K (2005)
Chile*	Santiago	Valparaiso	1990	98	4.6 million (1990)	800K (2002)
Nigeria	Lagos	Abuja	1991	541	5.7 million (1991)	-
Tanzania*	Dar-es-Salaam	Dodoma	1996	571	2.3 million (2002)	213K (2002)
Kazakhstan	Almaty	Astana	1997	974	1.1 million (1999)	281K (1999)
Malaysia**	Kuala Lumpur	Putrajaya	1999	47	1.7 million (2000)	70K (2000)
Myanmar (Burma)	Yangon	Naypyidaw	2005	330	4.1 million (2007)	-

*Legislative only; **Executive only. Multiple sources (see online appendix). We include designation of capital cities by independent countries; any designation at the time of independence is included only if chosen capital is different from colonial capital. (Mauritania had no colonial capital.) Instances where capital cities were moved within the same metopolitan area (<10km), namely Philippines (1975) and Sri Lanka (1982), are not included. (West) Germany (1990) and Albania (1920) are not included, since in these cases the existing regimes had maintained temporary capitals pending reunification and completion of independence process, respectively. "n.a." stands for "not available". Distance is measured "as the crow flies". All cities are referred to by their current English designations.

To be sure, the power of the capital is not absolute, and there are other forces that could push in the opposite direction. For instance, many have emphasized that isolation may help insurgencies by making repression more difficult, as in Mao Zedong's well-known account of guerrilla warfare (Mao 1961), or more broadly that concentration facilitates an incumbent autocrat's monitoring and suppression of opponents (Anthony and Crenshaw 2014). Similarly, while we argue that proximity to the capital may be important when it comes to insurgencies that aim at overthrowing an incumbent government, it could well be the case that distance favors those that are trying to break away from the country instead. In any case, the relationship between distance to the capital and the threat of insurgencies, as well as the implications of this relationship, ultimately constitute open questions to be explored both conceptually and empirically.

examples of universities being relocated away from the center of a capital city after episodes of student unrest, as illustrated by the relocation of the main campus of Seoul National University in South Korea, in 1975, or those of Parisian universities in the aftermath of the events of May 1968.

3 A Model of Capital Cities, Conflict, and Misgovernance

Against this background, we now propose a simple model of the joint determination of the quality of institutions and the degree of isolation of the capital city, mediated by the threat of conflict. Groups of individuals who are dissatisfied with existing institutions, under which an incumbent elite can extract rents from its citizens, can challenge them by rebelling. Our key assumption is that those who are closer to the capital city – the seat of political power – will (*ceteris paribus*) have an advantage in that regard.

Consider an economy populated by a continuum of individuals of measure one. A measure p of individuals are in power (the "incumbent elite", or "incumbents"), and the remaining individuals are "citizens". In order to capture the special role of the capital city in as simple a fashion as possible, we posit that there are two places where citizens can locate: the capital, denoted by $\mathscr{C}$, and elsewhere, which we denote by $\mathscr{F}$ (for "faraway"). We denote the fraction of citizens living in $\mathscr{F}$ by ℓ, which thus captures the degree of isolation of the capital city.

3.1 Capital Cities and Conflict

To focus on the link between capital cities and conflict, we start by studying the simplest possible environment: an endowment economy, with output exogenously set at some Y^*, in which the degrees of isolation of the capital (ℓ) and power sharing (p) are taken as given. The only relevant decision is that incumbents choose how much of that output they will get for themselves, and how much they will leave to citizens.

3.1.1 Conflict

Let us describe the rebellion technology.[9] In order to allow for conflict arising from different locations, we assume that there are n groups of citizens, each with the same size, and also (for the moment) that group membership does not cut across different locations: either all individuals in group $\imath$ are in $\mathscr{F}$ ($\ell_\imath = 1$), or they are all in $\mathscr{C}$ ($\ell_\imath = 0$).[10]

Define the net potential gain from conflict for group $\imath$ as:

$$\gamma_\imath \equiv \frac{y^*}{w_\imath} - T\ell_\imath - \chi_\imath, \tag{1}$$

where y^* is a constant, $w_\imath$ is the available income for group $\imath$, chosen by the incumbents, and $\chi_\imath$ is a random variable representing the cost of engaging in conflict. (In Appendix A, we show a simple model that microfounds this reduced-form formulation.)[11] This random variable captures fluctuations in the cost of putting together a rebellion, as well as the ability to solve the collective action problem for effective

[9] We will henceforth use the terms "rebellion" and "conflict" interchangeably, since conflict in our model emerges as groups of citizens rise against existing institutions.

[10] We take groups as given, for simplicity, but in Campante, Do and Guimaraes (2013) we show a model where group formation is endogenous.

[11] One possible interpretation for y^* is that, as in Acemoglu and Robinson (2006), a successful rebellion leads to a democracy, in which resources are equally divided among all groups, so that $y^* = Y^*/n$ (possibly up to a constant).

insurrection. For each group $\imath$, $\chi_\imath$ is drawn from a distribution described by a continuous p.d.f. $f(\cdot)$ and c.d.f. $F(\cdot)$, with full support over $[\underline{\chi}, \overline{\chi}]$ such that $0 < \underline{\chi} < \overline{\chi}$, independently across groups.

The positive constant T embodies our key assumption: those who are far from the capital ($\ell_\imath = 1$) obtain a lower net potential gain from launching a rebellion. This provides us with a simple shortcut for capturing the special role played by the capital city in insurrections. We impose $T < \underline{\chi}$, so that the penalty from being away from the capital, by itself, is never more important than all other costs involved in rebelling against the rulers.

A conflict involving group $\imath$ arises if it pays off for that group ($\gamma_\imath \geq 0$), and we further assume that, conditional on that conflict arising, the probability that it will dislodge the incumbent regime is given by $\pi(\gamma_\imath)$, with $\pi(0) = 0$ and $\pi' > 0$.[12] Put simply, this captures the idea that the rebellion effort will increase with the potential payoff, and that the likelihood of success is increasing in that effort. (We again refer to Appendix A for microfoundations.)

The timing of the model is as follows: the incumbents choose the share of output to be left to each group, $w_\imath$. Then the variables $\chi_\imath$ are realized, conflict may occur, and payoffs are realized. If there is conflict, ousted incumbents obtain a payoff normalized to zero. In the absence of conflict, everyone collects the payoff stipulated by the incumbents. The incumbent elite want to maximize the expected rents of their representative member, assumed to be risk-neutral, subject to the constraint that dissatisfied groups of citizens may rise up to overthrow them.

3.1.2 Results

It is convenient to define the cost threshold $\widehat{\chi}_\imath$ so that group $\imath$ will choose to rebel if $\chi_\imath \leq \widehat{\chi}_\imath$:

$$\widehat{\chi}_\imath \equiv \frac{y^*}{w_\imath} - T\ell_\imath. \tag{2}$$

For a given group $\imath$, a larger $\widehat{\chi}_\imath$ is associated with a lower income, conditional on that group's isolation with respect to the capital. Intuitively, we can thus think of $\widehat{\chi}_\imath$ as a measure of "relative squeeze" of group $\imath$ by the incumbents: how much that group's rents are pushed down, relative to its rebellion potential.

Let the function H denote the probability that group $\imath$ does not overthrow the incumbents. That can be expressed as a decreasing function of $\widehat{\chi}_\imath$:

$$H(\widehat{\chi}_\imath) = 1 - \int_{\underline{\chi}}^{\widehat{\chi}_\imath} \pi\left(\widehat{\chi}_\imath - \chi_\imath\right) f(\chi_\imath) d\chi_\imath.$$

We also define the function h as:

$$h(\widehat{\chi}_\jmath) \equiv -\frac{\partial H(\widehat{\chi}_\jmath)}{\partial \widehat{\chi}_\jmath} = \int_{\underline{\chi}}^{\widehat{\chi}_\imath} \pi'\left(\widehat{\chi}_\imath - \chi_\imath\right) f(\chi_\imath) d\chi_\imath. \tag{3}$$

which lets us define the hazard rate $\frac{h}{H}$ – roughly speaking, the rate at which the incumbent regime is overthrown by a given group j, as a result of a marginal increase in its relative squeeze $\widehat{\chi}_\jmath$.

Proposition 1 summarizes the key results of this simple model.

[12] We further assume that $\pi(\gamma_\imath) = 1$ for high enough $\gamma_\imath$, so that citizens always get a positive income $w_\imath$.

Proposition 1 *Suppose $\frac{h}{H}$ is an increasing function. Then, in equilibrium, $\widehat{\chi}_\imath = \widehat{\chi}_C$ and $w_\imath = w_C$ for all groups $\imath$ in $\mathscr{C}$, and $\widehat{\chi}_\imath = \widehat{\chi}_F$ and $w_\imath = w_F$ for all groups $\imath$ in $\mathscr{F}$. Unless all groups always rebel, we have:*[13]

(i) $\widehat{\chi}_C > \widehat{\chi}_F$: A group in $\mathscr{C}$ is more likely to rebel than a group in $\mathscr{F}$.

(ii) $H(\widehat{\chi}_F) > H(\widehat{\chi}_C)$: Successful rebellions are more likely to come from a group in $\mathscr{C}$ than from a group in $\mathscr{F}$.

(iii) For each $\imath$, an increase in $\ell_\imath$ reduces the risk of conflict and the risk of a successful conflict.

(iv) $\frac{w_C}{w_F} > 1$ and increasing in T: The income of those in $\mathscr{C}$ is larger than income of those in $\mathscr{F}$, and this premium is increasing in T.

Proof. *See Appendix B.1.* ■

Parts (i) and (ii) of this Proposition encapsulate the central results: *incumbents will allow for more conflict to emerge close to the capital, even though these rebellions are more dangerous for them.* Intuitively, this follows from the basic logic of the model: groups that have an easier time organizing a successful rebellion – namely, those who are closer to the capital – represent a greater threat to the incumbent elite. It is thus relatively expensive for incumbents to buy an extra amount of stability from them: it takes a large amount of extra consumption to keep them quiet, even for a relatively bad draw of $\chi_\imath$. Hence, incumbents will optimally choose to live with a greater probability of revolt by citizens who are closer to the capital, as opposed to further reducing their own rents in order to bring down that threat.

Part (iii) of Proposition 1 in turn states that a more isolated capital city is associated with less conflict and a lower risk for incumbent elites: insofar as conflict poses a greater threat when it takes place closer to the seat of power, an isolated capital offers protection. Finally, part (iv) shows that those who pose a greater threat end up obtaining more rents in equilibrium. This capital city premium is increasing in T, because a higher T represents an increasing advantage of those in the capital over those who are far away, in terms of the threat they pose to incumbents.

3.2 Capital Cities and Quality of Governance

We must take into account, however, that the degree of isolation of the capital city is not exogenously given to incumbent elites. To the contrary, they can affect the spatial distribution of individuals relative to the capital through a number of policy levers: from internal migration policies and specific economic incentives to populate certain areas to, most directly, the very location of the capital city. We thus build on the previous model to study the joint determination of $\ell_\imath$ and p, as part of the choice problem of incumbents.

[13] It is possible to have a corner solution such that $\widehat{\chi}_C = \widehat{\chi}_F = \overline{\chi}$ and all groups always rebel, but this case is evidently not interesting for our purposes.

3.2.1 Production, Quality of Governance, and the Spatial Distribution of Population

Now instead of an endowment economy, we consider a production function that depends on the spatial distribution of population (relative to the capital) and the quality of governance. Specifically, let ℓ^* be the output-maximizing degree of isolation of the capital city, which we take to be a primitive indicating the efficient spatial distribution of population relative to the capital.[14] We can take this to capture a balance between congestion costs and economies of scale, but the specifics are immaterial: the crucial point is that there is a cost to completely isolating the capital. In the absence of such a cost, the elite's problem would be trivially solved by totally isolating the capital, which would be both uninteresting and unrealistic.

We can then write:

$$Y = A(p)(Y^* - \phi(\Delta\ell)), \tag{4}$$

with

$$\ell \equiv \frac{\sum_\imath \ell_\imath}{n} \text{ and } \Delta\ell \equiv \ell - \ell^*,$$

and where Y is the level of output, Y^* corresponds to output when $\ell = \ell^*$ and $\phi(\Delta\ell)$ is the output loss owing to a choice of ℓ different from ℓ^*. We assume that ϕ is a convex function with $\phi(0) = 0$, $\phi'(0) = 0$ (optimality condition) and $\phi'' > 0$. As for power sharing p and productivity A, we assume that p can be chosen in the interval $[\underline{p}, \overline{p}]$ with $0 < \underline{p} < \overline{p} < 1$, and $A' > 0$, $A'' < 0$ and $A(p)/p$ is decreasing in p.[15]

The assumption on the productivity shifter A is the other key ingredient: productivity is enhanced by increasing the measure of individuals in power, p. This captures the idea that sharing power entails good governance: for instance, the provision of public goods such as protection of property rights and enforcement of contracts requires checks and balances that have to be provided by a set of civil authorities. We interpret an increase in p as the addition of such a set to the core of the incumbent elite, and their presence enables individuals to access better technologies that rely on those public goods. Under this assumption, we will refer to p interchangeably as a measure of power sharing or of quality of governance.

The downside of good governance, from the incumbents' standpoint, is that sharing power requires sharing rents: all individuals in power must receive the same payoff.[16] The choice of governance thus embeds a crucial trade-off between having a larger pie and taking a larger slice of a smaller one.

As for conflict, the rebellion mechanism is essentially the same as described in Section 3.1.1.[17] We now allow the incumbent elite to choose each $\ell_\imath$ from the entire interval $[0, 1]$ for the sake of tractability,

[14] To fix ideas, we can think of a country where resources are spread over the country's territory (say, the United States) as one where the optimal arrangement from a production standpoint involves a high degree of isolation ℓ^*. In contrast, a country where resources are geographically concentrated (say, Egypt) would exemplify a low ℓ^*. The Egyptian case is instructive, especially as the government has recently announced plans to build a new capital (Associated Press, March 20 2015). While we would think it is hardly coincidental that relocation plans have been revived soon after the revolutionary episodes of the Arab Spring, the fact that the planned seat of government would be located in the outskirts of Cairo indicates that it might be quite costly to move the capital too far away.

[15] In case $A(p)/p$ is increasing in p, there is no relevant trade-off, and it is optimal to set $p = \overline{p}$.

[16] This trade-off reflects the need to provide incentives for individuals in power to defend (and not rebel against) the current set of institutions. For a model, see Guimaraes and Sheedy (2015).

[17] The expression for $\gamma_\imath$ is the same as in (1). Multiplying $\gamma_\imath$ by some function of A would have no effect on results, since current incumbents would take that as given.

but the role of isolation can be interpreted as before.

3.2.2 Results

We can first state the following result, which helps build intuition for the forces at play in the model:[18]

Lemma 1 *In the model with endogenous location and governance:*

(i) For given $\widehat{\chi}_\imath$ and p, the isolation of the capital city (ℓ) is increasing in T and ℓ^*.

(ii) For given $\widehat{\chi}_\imath$ and ℓ, quality of governance (p) is decreasing in T and ℓ^*.

Proof. *See Appendix B.2.* ∎

The first statement identifies two parameters that are monotonically related to the equilibrium isolation of the capital city: an increase in ℓ^* (the optimal degree of isolation) or T (the impact of distance on the cost of rebellion) will increase ℓ. For the latter, the intuition is that a higher impact of distance on the cost of rebellion increases the effectiveness of isolating the capital city as a protection device.

The second statement shows that quality of governance is decreasing in T and ℓ. A larger T leads to an increase in the share of output that goes to incumbents as rents. Intuitively, when the average citizen poses a smaller threat to the incumbent regime, the latter can grab a larger amount of output, and is thus less willing to share rents in exchange for an increase in productivity. A larger ℓ^* has a similar effect.

These two statements, taken together, suggest a negative correlation between the quality of governance and the degree of isolation of the capital city. Still, they are only "partial" results: we need to take into account the mutual influence between p and ℓ, as highlighted in the previous subsection. As it turns out, we can state the following:

Proposition 2 *In the model with endogenous location and governance, if the variance of F is sufficiently small, changes in T and ℓ^* induce a negative correlation between the quality of governance (p) and the degree of isolation of the capital city (ℓ).*

Proof. *See Appendix B.3.* ∎

Proposition 2 delivers a key testable prediction, linking capital cities and quality of governance: *isolated capital cities tend to be associated with worse quality of governance.* This reflects causality going in both directions. Bad governance increases the incentives for isolating the capital city because incumbents in this case are relatively less worried about the costs of that isolation in terms of output losses, as these are

[18] An ancillary implication of the model (again, using the assumption that h/H is increasing) is that the benefit from increasing $\ell_\jmath$ is increasing on $w_\jmath$ and, consequently, decreasing in $\ell_\jmath$. Intuitively, shifting people 20 miles away from the capital is more important for the incumbents than moving people who are already far away to 20 miles further. This leads incumbents to choose the same $\ell_\imath$ for all groups $\imath$ in the economy. This is an advantage for tractability, but also makes it difficult to directly interpret the results in Proposition 1. However, assuming that some groups cannot be moved (say, because some groups have to be in the capital city) has no effect on the results of this section, and implies that essentially all results from Propositiion 1 hold in this model. The one exception is part (iii), which does not apply to this setup, as $\ell_\imath$ is now an endogenous variable.

smaller in a less productive economy. On the other hand, the protection afforded by an isolated capital means that rents can be easily collected; it follows that it is not worth increasing the productivity of the economy by improving governance, as it would imply distributing the rents more widely.[19]

3.2.3 Endogenous repression

We can also study the links between the isolation of the capital and the level of concern displayed by incumbents regarding the threat of conflict. For that we extend our basic model by assuming that incumbents can spend resources to increase their military power, in order to make rebellions more costly.

Suppose incumbents can invest in a protection technology D (for "defense"), which increases their ability to withstand rebellion threats – we can think of that as military spending, to focus ideas. The protection technology increases the cost of a rebellion, so the expression for $\gamma_\imath$ in (1) becomes:

$$\gamma_\imath \equiv \frac{y^*}{w_\imath} - T\ell_\imath - \chi_\imath - D$$

The cost of defense D is given by $\delta(D)$, with $\delta' > 0$ and $\delta'' \geq 0$. We then have:

Proposition 3 *If the variance of F is sufficiently small, then D is decreasing in ℓ^* and T.*
Proof. *See Appendix B.4.* ■

This implies that a more isolated capital city will be associated with lower levels of military spending. Intuitively, military spending and isolated capitals are substitutes in protecting the incumbents: when it is cheap to obtain protection by isolating the capital, there is less need to invest in military protection.

3.3 Discussion

Our framework, relying on the connection between the spatial distribution of population and the threat of rebellion, makes key predictions linking capital cities, conflict, and quality of governance. We highlight:

Prediction 1 *Conflict is more likely to emerge closer to the capital city.*

Prediction 2 *Conflict that emerges close to the capital is more dangerous to incumbents.*

Prediction 3 *Isolated capital cities are associated with misgovernance.*

Since the logic of our theory works through the mechanism of insurrection threats as a check on the behavior of incumbent elites, we would expect the forces it identifies to be weaker when that check is relatively less important. In particular, this should be the case for established democracies: rebellion

[19] Note that Proposition 2 assumes a small variance of F, which effectively limits the impact of incumbents' choices regarding the risk of a rebellion on their choices on the isolation of the capital and on governance. Generally speaking, because a more isolated capital tends to lead to more stability, and more stability also increases the incentives for good governance, for some particular combinations of parameters and functional forms, these effects could be so strong that increased isolation might coexist with better governance. (This could help explain, for instance, the institutional development of Brazil in the decades following the move of the capital, as speculated in Campante (2009).) If the variance of F is sufficiently small, they are never strong enough to overturn the aforementioned forces working towards a negative correlation.

threats are unlikely to be a particularly meaningful constraint impinging on incumbents in the US or Western Europe. This is another central testable prediction.

Similarly, another key test of our framework comes from the fact that it models conflicts as insurrections that aim at overthrowing an established government. As such, we should not expect the predictions to hold in the case of conflicts driven by other objectives – say, where the incompatibility is around territory (e.g. separatist insurgencies), or in the typical interstate conflict. In short, both democracies and conflicts that are not aimed at replacing an incumbent constitute "placebo" cases where we should not expect links between conflict, governance, and capital cities.[20]

Note also that the prediction that conflict is more likely closer to the capital stands in contrast with alternative theories of conflict. For instance, to the extent that conflict is associated with low state repressive capacity (e.g. Fearon and Laitin 2003), and that the reach of weak states gets even weaker as one moves away from the capital city (Michalopoulos and Papaioannou 2014), one would have predicted that the onset of conflict would be more likely farther from the capital.

Finally, the theory also yields ancillary testable predictions, which are not as central to the logic of the model but can nonetheless be used to further check its explanatory power. The model predicts that the isolation of the capital city will be negatively correlated with direct defensive measures that the elite may resort to. We interpret this as a negative correlation with military spending, insofar as the latter is often driven, to a substantial extent, by a concern with domestic rebellions.[21] In addition, it predicts that individuals living in the capital city will be relatively better off, because of the greater political threat that they represent, and that this premium will be positively correlated with the isolation of the capital.

4 Capital Cities, Conflict, and Misgovernance: Empirical Evidence

We now turn our attention to the empirical evidence regarding the key predictions of our framework. We will start by assessing the link between capital cities and conflict, which is at the heart of the logic of our model, and then move on to the implications linking capital cities and the quality of governance.

4.1 Capital Cities and Conflict

4.1.1 Data

We start by describing more extensively the variables needed to capture the main concepts needed to test the predictions of our framework regarding conflict and capital cities. (All other variables will be introduced as they are used, and described in the Online Data Appendix, which also contains descriptive statistics for all variables.)

[20] It is less clear that these other types of conflict would constitute placebos for Prediction 2, as it could be the case that, say, interstate conflict or conflict in a democracy would also be more destabilizing if they happened close to the capital.

[21] This prediction stands in contrast with alternative stories where the isolation of the capital is just an indication that the country is divided into different (and possibly antagonistic) regions, since in this case one would expect more investment in protection.

Testing our key predictions regarding the likelihood and consequences of conflict as a function of distance to the capital city requires geolocated information on the incidence of conflict. For that we use the PRIO-GRID dataset (Tollefsen, Strand and Buhaug 2012) (Advanced Conflict Data Catalogue (ACDC) project). This dataset makes available a number of different variables measured at the level of 0.5 x 0.5 decimal degree cells covering all terrestrial areas of the world. Each cell is, on any given year, attributed to one single (independent) country – for cells that straddle country borders, the attribution is to whichever independent country happens to contain the largest share of the cell's territory.

The dataset contains a measure of distance (in kilometers) from the cell centroid to the country's capital, but the designation of capital cities did not generally track the instances of capital city moves – we added those manually (as described in Table 2). However, the dataset does cover changes in capital cities due to the breakup and emergence of new countries. We will use those sources of variation as an integral part of our identification strategy, as we discuss below.[22]

The dataset also records geolocated information on conflict. We use as our first main variable of interest the dummy $CivConf$, coded for the years between 1989 and 2008 (Hallberg 2012), which indicates whether a cell lies within an area afflicted by intrastate conflict in a particular year. Specifically, the data classifies conflict types into: conflicts between a state and a non-state group outside its own territory ("colonial wars," coded as "1"), betwee two or more states (interstate conflicts, "2"), conflicts between a state and one or more non-state actors inside its own territory (intrastate conflicts, "3"), and intrastate conflicts with intervention from other states (internationalized intrastate conflicts, "4"). Our variable captures conflicts classified as "3" or "4," since intrastate conflict is the kind of event our framework is concerned with.

The conflict-afflicted area is defined, for each year in a given conflict, as the circular polygon that encompasses all of the recorded battles. All cells that intersect this polygon will be recorded as $CivConf =$ 1. This entails two kinds of measurement error for this variable: "false negatives" and "false positives". The former refers to the fact that there could be battles in a conflict that fail to be registered; as a result, a grid cell could be coded as 0 when in fact it should have been coded as 1. The latter comes from the fact that there will be cells that intersect the circular conflict polygon, and are therefore reported as positives, but where there were actually no battles.

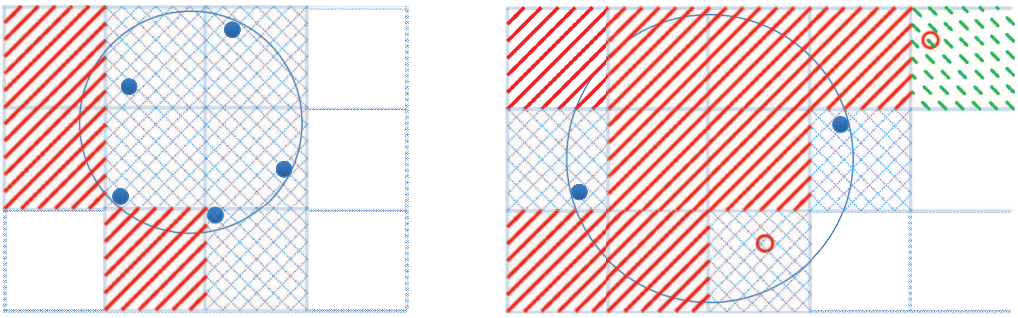
If measurement error correlates with distance to the capital, this could systematically bias our results. It is thus worth discussing the possible correlations. The natural assumption would be that false negatives (from battles that fail to be reported) are more likely far from the capital: underreporting is likely to be greater when population density is lower, and population density is lower, on average, away from the

[22]We were careful not to include as changes in capital cities the instances in which a given cell is reassigned to a different country simply as a result of the latter becoming independent, with no actual breakup or annexation involved. For instance, suppose a cell happens to be on the border between Ghana and Cote d'Ivoire, with 40% of its territory on the former and 60% on the latter. The dataset would attribute that cell to Ghana between 1957 (when that country became independent) and 1960 (when Cote d'Ivoire did), because Cote d'Ivoire was then coded as missing. From 1960 onwards, it would attribute the cell to Cote d'Ivoire. In that case, we attributed the cell to Cote d'Ivoire for all years.

capital.[23] This would bias us in favor of finding in favor of our Prediction 1. On the other hand, as long as the density of battles is also related to the density of population, the likelihood of false positives also increases with distance. This would bias results against that same prediction.

There is reason to believe a priori – though by definition it is impossible to test – that false positives are actually going to be more numerous than false negatives. After all, a false negative would emerge only in the case of an unrecorded battle that occurred in a cell that does not overlap with the circular conflict polygon. As such, it seems plausible to assume that, if anything, measurement error issues are more likely to bias us against finding our results.

This argument can be illustrated by Figure 1. In both panels, one battle is represented by a dot, with the color blue representing those battles that are reported in the data set, while the color red marks unreported battles. The circle polygons correspond to the conflict area as measured in the data set – namely, the smallest circle encompassing all recorded battles. In Panel A, we show a conflict in which battles are more densely distributed, whereas in Panel B we see a conflict that is smaller, but where battles are more widely spread geographically. In the latter conflict, as a result of the lower density, some of the battles go unreported. However, the dispersion also means that the circle polygon is larger. As a result of the underreporting, we see the emergence of a "false negative" grid cell (in green). However, because of the larger polygon we see the emergence of five additional "false positive" cells (in red). Note in addition that there is an unreported battle in Panel B that does not lead to a "false negative," as it takes place in a cell that intersects the polygon. In sum, Panel B would translate into a higher probability of conflict per cell, even though the example is such that the probability of conflict per cell should actually be smaller.



Panel A: Conflict in a High-Density Area

Panel B: Conflict in a Low-Density Area

Notes: Solid blue dots are observed battles, hollow red dots are unobserved battles. The circles correspond to the conflict polygons, which yield four kinds of cells: "true positives" (blue, crossed), "false positives" (red, upward lines), "true negatives" (white, unfilled), and "false negatives" (green, downward dashes).

Figure 1: An Illustration of Measurement Error

We also want to exploit distinctions between different types of conflicts, in order to build placebo

[23]The correlation between population and distance is roughly −0.6 in our sample. Moreover, a simple regression of (log) grid-cell population size on log distance (with country fixed effects), yields a coefficient around −1.5, indicating that population falls more than proportionally to distance. A look at the raw data (Appendix Figure A.1) also conveys this negative correlation.

specifications, as argued in the previous section, and shed further light on the nature of the connections between distance and conflict. The first placebo is to use interstate conflict (type "2"). For other distinctions, we match the Prio-GRID data to the original conflict dataset from which it derives – namely, the UCDP/PRIO Armed Conflict Dataset (Gledditsch et al 2002, Themnér and Wallensteen 2014) – which classifies the incompatibility motivating each conflict. In particular, it distinguishes between conflicts driven by disputes over the status of a territory, which in the case of intrastate conflicts is typically about secession or autonomy, and those driven by disputes over the type of political system, the replacement of the central government, or the change of its composition. We will henceforth refer to these as "territorial" and "government" conflicts, and take the former to be a placebo case.

We will also look into differences in terms of conflict intensity. The UCDP/PRIO data defines conflict as requiring a minimum of 25 battle-related deaths in a given year, but it distinguishes between "war" (at least 1,000 battle-related deaths) and "minor armed conflict" for the range between 25 and 1,000. It would be reasonable to assume that measurement error related to under-reporting would be less prevalent in full-scale wars, so this provides us another window into the issue.

We will consider a second key conflict variable from the PRIO-GRID dataset, namely *Onset* (Gleditsch et al 2002, Strand 2006). This variable indicates for every cell-year pair whether a conflict started in that cell-year. It has the advantage of affording a longer time period, as it is coded for the years between 1946 and 2004, which will let us exploit the time variation more thoroughly. On the other hand, it refers to occurrences that are obviously a lot less frequent, which makes the data relatively sparse.

4.1.2 Conflict Is More Likely Closer to the Capital

We first consider the evidence taking grid cells as the unit of analysis. More precisely, we estimate the following specification:

$$Y_{ic} = \gamma_0 + \gamma_1 * LogDistCapital_{ic} + X_{ic}\Gamma + \mu_c + \varepsilon_{ic}, \tag{5}$$

where Y_{ic} is a measure of conflict in grid cell i in country c. Note that we leave aside the time variation in the conflict variables, for the moment, to focus on the average probability of conflict in a cell, taken over the entire available period – namely, 1989-2008 for the occurrence of conflict ($CivConf$), and 1946-2005 for conflict onset ($Onset$). $LogDistCapital$ stands for the log of distance from the grid cell to the capital city, and Prediction 1 is encapsulated in $\gamma_1 < 0$: the likelihood of conflict is smaller in cells that are farther from the capital. X_{ic} is a vector of control variables (also from the PRIO-GRID dataset), which help us deal with a number of factors that may correlate with the likelihood of conflict: income per capita, population, and infant mortality as measures of socio-economic conditions, travel time to the nearest major city as a measure of broad isolation as well as urbanization, and a number of geographic characteristics (share of mountainous terrain and forest coverage, latitude, average temperature and precipitation).[24] μ_c are

[24] All of these variables are also averaged over the relevant period.

country fixed effects, so that we focus on the variation within countries, and ε_{ic} is the error term. We cluster standard errors at the country level, to allow for correlated shocks within countries.

Table 3: Distance to the Capital and Conflict

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Average probability of conflict (CivConf)			Average probability of conflict onset (Onset)		
Sample	Full	Polity ≤0	Polity >0	Full	Polity ≤0	Polity >0
Log Distance to Capital	-0.00316	-0.0318**	0.00586	-7.47e-05**	-0.000132**	-1.65e-05
	[0.00792]	[0.0126]	[0.00908]	[3.55e-05]	[5.51e-05]	[4.09e-05]
Full set controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	55,071	15,569	39,502	54,864	33,479	21,385
R-squared	0.804	0.817	0.793	0.039	0.038	0.049

Robust standard errors in brackets are clustered at country level. Each observation represents a grid cell's averages over time. Each column's sample is determined by the average of Polity score over the period where conflict data are available. Columns (1) to (3) use the indicator of ongoing conflicts in each cell, averaged from 1989 to 2008 where conflict data are available. Columns (4) to (6) use the indicator of conflict onsets (the start of a new conflict) in each cell, averaged from 1946 to 2008 where conflict onset data are available. All columns include the averages over the corresponding period of the following variables for each cell: log Gross Cell Products per capita (night luminosity-enhanced measures, available in 1990, 1995, 2000, 2005), log population (available in 1990, 1995, 2000, 2005), temperature, precipitation, cell size. In addition, all columns control for: infant mortality rates, proportion of mountain area (all measured in 2000), log travel time to the nearest urban area, and cell latitude. Country fixed effects are included. *** p<0.01, ** p<0.05, * p<0.1.

The results are in Table 3. Column (1) shows the correlation between average $CivConf$ and the measure of distance to the capital city, for the full sample. We see no evidence of a link. However, Column (2) shows that countries with an average Polity score below (or equal to) zero – a threshold meant to encompass "autocracies" and "closed anocracies," as defined by the Polity IV dataset – display a strong negative correlation: conflict is more likely in areas that are closer to the capital.

This result is consistent with Prediction 1 from our framework. Moreover, the placebo specification in Column (3) shows that the relationship is absent in the sample of relatively democratic countries, as we would expect: the prediction holds only for countries where our logic of insurrections as a check on incumbent behavior ought to be more important. Quantitatively, our estimate of -0.0318 implies that halving the distance to capital city would increase conflict probability by 2.2 percentage points ($= \log(2) \times 0.0318$), or about 16.8% of 13.1 percentage points, the average probability of conflict per cell in this subsample. (The standard deviation of log distance to capital in this subsample is 0.864, corresponding to a change of distance by a factor of about 2.4.)

The remainder of Table 3 considers conflict onset ($Onset$) as the dependent variable, and shows a similar pattern distinguishing autocracies and democracies. Note that now a correlation emerges even for the full sample (Column (4)). This is because the number of countries coded as autocracies is much larger for the period 1946-2005 than for the period 1989-2008 for which the $CivConf$ variable is computed. Still, the pattern is once again very different between autocracies and democracies, as the correlation holds only for the former. Quantitatively, the estimate of -0.000132 implies that, in autocracies, halving the distance to capital city would increase the chances of conflict onset by 0.00009, which would imply roughly doubling the mean of *Onset* in this sample.

The message comes into clearer focus when we break down the analysis according to the different kinds of conflict. This is what we see in Table 4, where the focus is on the sample of autocracies and closed anocracies. Panel A focuses on the probability of conflict (*CivConf*), whereas Panel B reproduces the same results using conflict onset (*Onset*), with broadly similar results. Columns (1) and (2) show that the link between conflict and distance to the capital is entirely driven by the government type: territorial conflicts display no significant link whatsoever, with a coefficient that is much smaller in absolute value. This is again exactly in line with what we would expect from our framework.

Columns (3) and (4) break intrastate conflicts along a different dimension: strictly intrastate wars (coded as "3" in PRIO-GRID), and internationalized intrastate wars (coded as "4"), respectively. We see that the result is driven entirely by the standard intrastate variety. Columns (5)-(6) in turn show that the result is present both in relatively minor conflicts and full-scale wars, in which the issue of measurement error should be less important. Last but not least, Column (7) shows that there is no relationship between distance to the capital and interstate conflict.

In sum, our placebo specifications confirm that conflict is more likely closer to the capital only in the types of conflict that better fit the logic of our framework. We should also note that it is unlikely that measurement error, be it of the "false negative" or "false positive" kind, would be disproportionately problematic for conflicts around government. As such, the fact that we find no relationship between conflict and distance to the capital in the case of territorial conflict is also suggestive that our key results are not unduly affected.

4.1.3 Conflict Becomes More Likely When the Capital Is Moved Closer

A different look at the link between distance to the capital and conflict comes from exploiting the variation over time in the conflict data. Generally speaking, distance to the capital is constant for a given grid cell, but there are two important kinds of exception to this rule, which afford us some variation over time. First, when the same grid cell becomes part of a different country, the relevant capital city changes as a result. Second, the same is true when a given country changes its capital. To the extent that these events are uncorrelated with time-variant grid-cell characteristics, we can consider the effects of those quasi-random "treatments" of changing distance to the capital.

To better understand the nature of the variation, Table 5 lists the countries containing grid cells where distance to the capital is not a constant value, over the years, in our dataset. We see four distinct groups of countries. First, the former Soviet Union and Yugoslavia illustrate the two major episodes of country breakups. A third group of countries comprises those that moved their capital cities over the period of analysis. The remainder ("Other") is a mixture of country breakups, reunifications, and changing borders.

Table 4: Distance to the Capital and Different Types of Conflict

Panel A: Conflicts (*CivConf)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	Polity ≤0						
Dependent variable of *conflict* type	Government	Territory	Strictly intrastate	Intrastate expanded	Intense	Less intense	Interstate
Log Distance to Capital	-0.0262**	-0.00739	-0.0299***	-0.00205	-0.0114**	-0.0219**	0.000604
	[0.0115]	[0.00536]	[0.0111]	[0.00281]	[0.00553]	[0.00948]	[0.000667]
Full set controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,569	15,569	15,569	15,569	15,569	15,569	15,569
R-squared	0.778	0.885	0.785	0.926	0.846	0.816	0.667

Panel B: Conflict Onsets (*Onsets*)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	Polity ≤0						
Dependent variable of *onset* type	Government	Territory	Strictly intrastate	Intrastate expanded	Intense	Less intense	Interstate
Log Distance to Capital	-0.000131**	-3.34e-05	-0.000116**	-1.61e-05	-4.64e-05	-0.000107**	-4.82e-07
	[5.67e-05]	[2.96e-05]	[4.60e-05]	[1.92e-05]	[2.91e-05]	[4.17e-05]	[5.86e-07]
Full set controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33,479	33,479	33,479	33,479	33,479	33,479	33,479
R-squared	0.055	0.014	0.040	0.020	0.018	0.040	0.011

Robust standard errors in brackets are clustered at country level. Panel A considers ongoing *conflicts* of different types from 1989 to 2008, and Panel B considers *onsets* of different types of conflicts from 1946 to 2005. Each observation represents a grid cell's averages over the corresponding period. The sample is restricted to nonpositive average of Polity score over the period where the corresponding measure of conflicts or conflict onsets are available. The dependent variable is the indicator of ongoing conflicts, or onsets, of a particular conflict type in each cell. Columns (1) and (2) distinguish between conflicts arising from incompatibility of government versus territory. Columns (3) and (4) distinguish between strictly intrastate conflicts and other intrastate conflicts in which other state(s) later intervene(s). Columns (5) and (6) distinguish between conflicts of at least 1,000 estimated casualties and the less intense ones. Column (7) uses interstate conflicts only. All columns include the averages over the corresponding period of the following variables for each cell: log Gross Cell Products per capita (night luminosity-enhanced measures, available in 1990, 1995, 2000, 2005), log population (available in 1990, 1995, 2000, 2005), temperature, precipitation, cell size. In addition, all columns control for: infant mortality rates, proportion of mountain area (all measured in 2000), log travel time to the nearest urban area, and cell latitude. Country fixed effects are included. *** p<0.01, ** p<0.05, * p<0.1.

In the Online Appendix, we show that the results that follow remain qualitatively unaffected when we drop each of these groups at a time, which reassures us that they are not driven by the specificities of each subgroup.

Table 5: Understanding the Sources of Variation: Countries containing grid cells with changing distance to the capital

Soviet Union	*Yugoslavia*
Armenia Azerbaijan Belarus Estonia Georgia Kazakhstan Kyrgyzstan Latvia Lithuania Moldova Russia Tajikistan Turkmenistan Ukraine Uzbekistan	Bosnia and Herzegovina Croatia Kosovo FYR Macedonia Montenegro Slovenia Yugoslavia
Changes in Capital Cities	*Other*
Brazil China Cote d'Ivoire Germany* Myanmar Malawi Nigeria Pakistan* Tanzania	Bangladesh Czechoslovakia Egypt Eritrea Ethiopia Germany* Israel Namibia Pakistan* Romania South Vietnam South Yemen Slovakia Syria Vietnam Yemen

Note: To construct this table, we first flag the grid cells for which the measure of distance to the capital is not the same for all years in the sample. We then tabulate the countries to which at least one of these grid cells was assigned, considering all years. For instance, a cell in the Sinai Peninsula are attributed to Israel (between 1967 and 1979) and Egypt (other years).

We thus implement specifications with grid-cell fixed effects, focusing on conflict onset because of the longer time dimension in the panel.[25] Specifically, we estimate:

$$Y_{ict} = \lambda_0 + \lambda_1 * LogDistCapital_{ict} + W_{ict}\Lambda + \nu_i + \omega_t + \varepsilon_{ict}, \tag{6}$$

[25] When it comes to the average probability of conflict, $CivConf$, we are left with little of the relevant variation: starting the sample in 1989 leaves out the vast majority of pre-move observations – not only for the ex-USSR and ex-Yugoslavia, but for a number of countries in the other two categories in Table 5 as well. Not surprisingly, the results are entirely inconclusive (available upon request).

where t now indexes a given year. Our specifications will also include year fixed effects, which should account for factors that affect all countries in a given period, such as the end of the Cold War, and we again cluster the standard errors at the country level. Any time-invariant characteristics are picked up by the grid-cell fixed effects ν_i, so our vector of control variables W_{ict} now includes time-variant factors available on a yearly basis: (log) distance to border, temperature, and precipitation. This helps us control for climate shocks, which have have been flagged as relevant in the conflict literature (Miguel, Satyanath and Sergenti 2004, Burke et al 2009, Brückner and Ciccone 2011, Couttenier and Soubeyran 2014).

Table 6 presents the results, distinguishing between the different kinds of conflict explored in Table 4. Column (1) shows that the onset of intrastate conflict becomes less likely, in the non-democratic subsample, when the capital is moved farther away from a grid cell. Quantitatively, the estimate of -0.000353 among non-democratic countries implies that halving the distance to capital city would increase conflict onset probability by 0.0001, rather similar to the magnitude we found in the cross-sectional analysis in Table 3.

Table 6: Changes in Distance to the Capital and Conflict: Within-Cell Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sample	Polity ≤0, 1946-2005								Polity>0, 1946-2005	Polity ≤0, [-5,+5] of cap. change	
Dependent variable of *onset* type	All intrastate	Government	Territory	Strictly intrastate	Intrastate expanded	Intense	Less intense	Interstate	All intrastate	Government	
Log Distance to Capital	-0.000353**	-0.000267**	-0.000139	-0.000289**	-6.40e-05*	-7.74e-05	-0.000265**	1.02e-06	2.96e-05**	-0.000593**	-0.000477*
	[0.000154]	[0.000122]	[8.93e-05]	[0.000144]	[3.77e-05]	[5.79e-05]	[0.000131]	[1.12e-06]	[1.13e-05]	[0.000290]	[0.000278]
Full set controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cell FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Extra control											Yes
Observations	1,914,640	1,914,640	1,914,640	1,914,640	1,914,640	1,914,640	1,914,640	1,914,640	1,467,596	88,215	88,215
R-squared	0.037	0.032	0.040	0.037	0.024	0.027	0.037	0.026	0.030	0.120	0.120

Robust standard errors in brackets are clustered at country level. Each observation represents a grid cell * year. Each column's sample is determined by the average of Polity score over the period 1946-2005, where conflict onset data are available. The dependent variable is the indicator of conflict onsets of conflicts of a particular type in each cell. Columns (1) uses all intrastate conflicts. Columns (2) and (3) distinguish between conflicts arising from incompatibility of government versus territory. Columns (4) and (5) distinguish between strictly intrastate conflicts and other intrastate conflicts in which other state(s) later intervene(s). Columns (6) and (7) distinguish between conflicts of at least 1,000 estimated casualties and the less intense ones. Column (8) uses interstate conflicts only. Column (9) considers all countries with positive average Polity score. Columns (10) and (11) consider cells that have experienced a change of the relevant capital city, and restrict the sample to within 5 years of the capital city change. Grid cell fixed effects and year fixed effects are included. Control variables include log distance to border, temperature, and precipitation. Column (11) further controls for full interactions of average log distance from all cells in a country * pre/post-capital change dummy. *** p<0.01, ** p<0.05, * p<0.1.

Columns (2)-(8) then show that the connection between distance and conflict onset is driven by government, purely intrastate conflicts: it is statistically insignificant and/or quantitatively very small in territorial intrastate, internationalized intrastate, and interstate conflicts. In addition, the subsample of relatively democratic countries displays a coefficient that is positive, and quantitatively rather small (Column (9)). This is again reassuring that the mechanism is consistent with the logic we emphasize.

The panel specification does have drawbacks. First, the variation is coming from a small set of countries, which makes it more remarkable that we find robust results, but also raises natural questions about external validity. Second, we have a reduced set of available time-varying control variables. For instance, we cannot control for population, since the data is available only for a small subset of years, and as such, the effect we find in Table 6 could be partly driven by population being drawn to a certain area once it becomes closer to the capital city.

One way to assuage these concerns is to restrict our attention to a relatively short window around the changes in borders or capital city. If the results were driven by changes in cell characteristics such as population or GDP per capita that follow such an event, one might expect that it should take a reasonably long period for these changes to translate into the onset of conflict. Column (10) thus restricts the sample to within 5 years before and after the change in distance to the capital. The association between the onset of government conflicts and distance to the capital is actually even stronger within this short window, suggesting that the effect does not come from relatively slow-changing factors such as population size.

In addition, one might speculate that changes in capital cities, not being random events, could correlate systematically with conflict. For instance, it could be that conflict becomes more likely after a breakup episode, and it stands to reason that the average distance to the capital would fall as a country splits into smaller ones, which could bias the results towards finding support for our prediction. We would argue that this is unlikely to drive the results: it seems more natural to think that the conflicts surrounding partition would be more likely to be categorized as interstate (or "internationalized" intrastate), or at least territorial conflicts. This is hard to square off with the fact that our results are strongest for conflicts around government. Similarly, when it comes to moving the capital city, it seems natural that a ruler's incentives would most likely be towards moving the capital to places where conflict would be intrinsically less, not more, likely.

To deal with this concern more directly, we estimate the following alternative specification:

$$Y_{ict} = \lambda_0 + \lambda_1 * LogDistCapital_{ict} + \lambda_2 * \overline{LogDistCapital}_{ct} \times PostChange_{it} + \tag{7}$$

$$+\lambda_3 * PostChange_{it} + W_{ict}\Lambda + \nu_i + \omega_t + \varepsilon_{ict}, \tag{8}$$

where $\overline{LogDistCapital}_{ct}$ is the average distance to the capital among all cells in country c in year$t$, and $PostChange_{ct}$ is a dummy equal to one if t is any year after a change in the distance between cell i and the capital city. This controls for a break in the relationship between distance and conflict following a change in the capital. Column (11) displays the result: we again see a significant effect of larger magnitude, albeit less precisely estimated.

Finally, it is reassuring that the results we find here are in line with what we had obtained using the cross-sectional variation, in Tables 3 and 4. In addition, and as before, it also seems unlikely that whatever biases may be in play would generate results only in the types of conflict that pertain to our story. In sum, while the appropriate caveats lead us to refrain from attaching a causal interpretation to any of our estimates, the body of evidence suggests that our mechanism is qualitatively and quantitatively important in understanding the spatial distribution of conflict.

4.1.4 Conflict Is More Dangerous Closer to the Capital

We then turn to Prediction 2, namely that conflict that happens closer to the capital is more likely to dislodge the incumbent regime. For that we adapt our panel strategy, as in (6), using the following specification, connecting the country-level regime change outcome and the grid-cell-level data on conflict and distance:[26]

$$RegimeChange_{ct} = \beta_0+\beta_1 * Y_{ict} \times DistCapital_{ict}+\beta_{2i} * Y_{ict}+\beta_3 * DistCapital_{ict}+W_{ict}B+\nu_i+\omega_t+\varepsilon_{ict}. \quad (9)$$

$RegimeChange_{ct}$ is an indicator of whether there is a change in regime in country c, as coded in the Polity IV dataset, in the five-year interval after year t.[27] Prediction 2 entails $\beta_1 < 0$: as a grid cell becomes more distant from the capital, the connection between conflict in that cell and subsequent regime change gets weaker.

The specification includes interactions of cell-specific coefficients (β_{2i}) with the conflict variable (Y_{ict}), to control for any observed or unobserved time-variant cell characteristics that could govern how conflict in that cell may affect regime change.[28] The identification of β_1 thus comes, again, from changes in borders and capital cities. We again focus on *Onset* as the key conflict variable, in order to maximize the relevant variation, and cluster the standard errors at the country level, which is particularly relevant since the variation on the outcome variable occurs at that level.

Table 7 shows the results, focusing on the sample of non-democracies. The model's prediction is again supported by the evidence. Column (1) shows that, if the capital is moved farther away from a grid cell, the link between the onset of conflict related to government, in that grid cell, and the likelihood of subsequent regime change in the country gets weaker. This is true even if we control for country-specific time trends (Column (2)), or the interaction of *Onset* with cell-country fixed effects (instead of cell fixed effects) (Column (3)), which leaves aside the variation coming from cells that change countries. The result is also similar if we measure *RegimeChange* not with an indicator, but with the average over the subsequent five-year period (Column (4)), or if we focus our attention on intense conflict (Column (5)).

As we have noted, it is less obvious that all of our aforementioned placebos would be meaningful in this case – it is plausible that interstate conflict, for instance, could also be destabilizing for an incumbent regime, and more so if it happens to emerge close to the capital. Still, it is interesting to see that conflicts over territory do not display the same pattern (Column (6)).

This specific result is important, especially since the spatial distribution of conflict is clearly endogenous. In particular, reverse causality is a concern: it could be the case that the very fact that a regime is wobbling would lead to more conflict arising closer to the capital. In the absence of a source of exogenous

[26] This is similar to Iyigun, Nunn, and Qian (2015), who consider state size as an aggregate-level variable, and how it relates with grid-cell-level data on conflict and agricultural productivity.

[27] Specifically, as described in greater detail in the online Data Appendix, we use the variable "Regime Transition," which is coded as a significant (at least three-point) change in the polity's democracy or autocracy score. The idea is to capture more profound changes in the political system, as distinct from, say, changes in the identity or part of the leader.

[28] This specification is equivalent to one with group fixed effects, with groups defined by cell interacted with conflict status.

Table 7: Conflict Onset and Regime Change

	(1)	(2)	(3)	(4)	(5)	(6)
Sample			Polity ≤0			
Dependent variable: *Regime Change* within 5 years	Indicator	Indicator	Indicator	Average	Indicator	Indicator
Type of conflict *onset*	Government	Government	Government	Government	Intense	Territory
Onset X Log Distance to Capital	-0.321***	-0.375***	-0.463***	-0.129***	-0.321***	0.0611
	[0.0598]	[0.0340]	[0.0701]	[0.0108]	[0.0597]	[0.361]
Full set controls	Yes	Yes	Yes	Yes	Yes	Yes
(Cell X *onset*) FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls		Country-specific time trends	(Cell * *onset* * country) FEs			
Observations	1,913,481	1,913,481	1,913,481	1,913,481	1,913,481	1,913,481
R-squared	0.292	0.404	0.302	0.363	0.292	0.292

Robust standard errors in brackets are clustered at country level. Each observation represents a grid cell X year over the period from 1946 to 2005 where conflict onset data are available. The sample is restricted to countries with nonpositive averaged Polity score. In columns (1), (2), (3), (5), (6), the dependent variable is the indicator of *Regime Change* within 5 years associated with the cell, while column (4) uses the average of *Regime Change* within 5 years. All columns control for fixed effects at the level of cells interacted with the onset dummy (see text for interpretation), year fixed effects, log distance to capital and log distance to border, temperature, and precipitation. In addition, column (2) controls for country fixed effects interacted with time trends, and column (3) controls for fixed effects at the level of cells interacted with countries interacted with the onset dummy. Columns (1) to (4) uses conflicts arising from incompatibility of government. Column (5) uses intense conflicts, namely those of at least 1,000 estimated casualties. Column (6) uses conflicts arising from incompatibility of territory. *** p<0.01, ** p<0.05, * p<0.1.

variation, it is reassuring that we find no significant link between regime change, distance, and territorial conflict.[29] After all, it stands to reason that reverse causality should affect that type of conflict as well.

In sum, although we again refrain from any causal interpretation for our estimates, the evidence suggests that the danger posed by conflict to incumbent regimes, in non-democratic countries, is weaker the farther away the capital city is moved from where that conflict emerges, in line with Prediction 2.

4.2 Capital Cities and Quality of Governance

4.2.1 Data

In order to measure quality of governance across countries, we resort to the well-known and widely used Worldwide Governance Indicators (WGI), from the World Bank (Kaufman, Kraay and Mastruzzi, 2010). They aggregate information, from a number of different sources ranging from surveys of households and firms to assessments from NGOs, commercial providers and public organizations, into six different measures: Rule of Law, Voice and Accountability, Government Effectiveness, Regulatory Quality, Control of Corruption, and Political Stability. Since the year-to-year variation in the quality of governance measures is not very meaningful, we will average them over time for the entire period for which the WGI are available (1996-2012, bi-annually until 2002). To make things as simple as possible, and making use of the fact that these individual measures are very highly correlated with one another, we will summarize them in a

[29]We have experimented with weather and climate shocks as possible instruments to deal with that reverse causality, although these would not assuage all concerns with omitted variables. In any case, the first stage fails to work: climate shocks do not predict conflict onset in this context, consistent with Coutennier and Soubeyran (2014).

single number, using the first principal component of the six measures taken together.[30]

When it comes to measuring how isolated a capital city is, we use the axiomatically grounded family of measures of spatial concentration (or equivalently, isolation) around a point of interest proposed in Campante and Do (2010). Specifically, they show that a very simple and easily interpretable measure of isolation has a number of desirable properties (and uniquely so): the average log distance to the capital city – which for shorthand we will describe as $AvgLogDistance$.[31]

We compute the measure using the database *Gridded Population of the World* (GPW), Version 3 from the Socio-Economic Data Center (SEDC) at Columbia University. This dataset, published in 2005, contains the information for the years 1990, 1995 and 2000, and is arguably the most detailed world population map available. Over the course of more than 10 years, these data are gathered from national censuses and transformed into a global grid of 2.5 arc-minute side cells (approximately 5km, or 3 miles), with data on population for each of the cells in this grid. As it turns out, the autocorrelation in the measure of population concentration is very high across the ten-year period in question. For this reason, we choose to focus on $AvgLogDistance$ as computed for the one year, 1990, that is judged by the SEDC as having the highest data quality. [32]

We focus on a measure of distance that adjusts for the geographical size of the country, to allow for the possibility that a given distance could mean different things in countries that are geographically small or large: 100 miles could be seen as a long distance in Belgium, but not so much in Canada. That said, we will also look at a version that does not adjust for geographical size, for the sake of robustness.

4.2.2 Isolated Capital Cities and Misgovernance

The raw data, as displayed in Figure 2, show a negative correlation between the first principal component of the six WGI governance measures and $AvgLogDistance$, our benchmark measure of isolation. For more systematic evidence, we consider the following regression specification:

$$Y_c = \gamma_0 + \gamma_1 * AvgLogDistance_c + X_c\Gamma + \varepsilon_c, \tag{10}$$

where Y_c stands for the measure of quality of governance, and X_c is a vector of control variables that are often associated with governance – ranging from GDP per capita, urbanization, and population, to ethnic fractionalization and characteristics of the political system (such as the presence of majoritarian elections

[30]The correlation between the different average measures, in our sample of 178 countries, is never below 0.73, and typically far above 0.8. The Kaiser-Meyer-Olkin overall measure of sampling adequacy is 0.896, indicating that a principal components analysis is warranted.

[31]See Campante and Do (2010) and Campante and Do (2014) for a more extensive discussion. A description of the index as we actually compute it in practice, given the data we have, can be found in the Data Appendix. An important practical issue refers to how we deal with countries that have multiple capitals. The Data Appendix documents how we deal with these issues, but in any case the results are unaffected by any of these choices.

[32]We limit our analysis to countries with more than one million inhabitants, since most of the examples with extremely high levels of concentration come from small countries and islands. In addition, all of our analysis will exclude Mauritius, because it is an outlier in terms of the concentration of population. As it turns out, our results are made stronger by its inclusion, so we want to make sure that nothing is driven by this specific case.

or of a presidential system), as well as regional and legal origin dummies.[33] (All control variables in our analysis are averaged over the same period for which the governance measure is calculated, 1996-2006, unless noted otherwise.)

The results are in Table 8. (All tables henceforth report coefficients estimated for the standardized variables, so that they should be interpreted in terms of standard deviations, as computed for the full sample.) Columns (1)-(2) confirm the message from the raw correlation, in Columns (1)-(2). The correlation is statistically significant, and robust to the inclusion of the vector X_c of control variables.

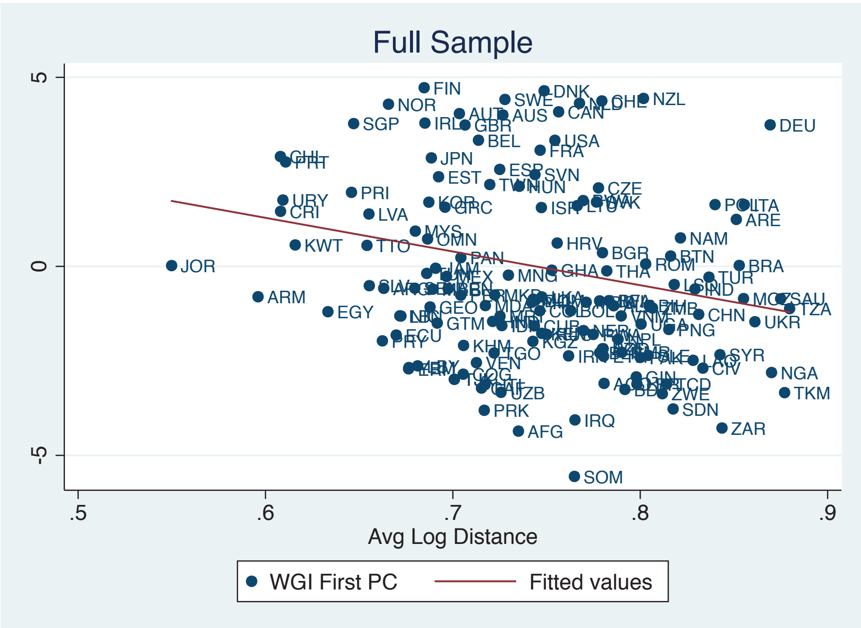


Figure 2: Governance and Isolation of the Capital City

As it turns out, this broad pattern again masks differences between democracies and non-democracies, as suggested by the theory. To see this, we can again focus on the threshold of Polity score equal to zero, which here translates roughly into the bottom tercile of our sample, and compare it with the set of full-fledged, established democracies, as defined by a Polity score above 9. Figure 3 shows the scatterplots for the two subsamples: there is essentially no correlation in the group of established democracies, whereas a negative association emerges in the sample of autocracies.[34]

This central message is underscored by the systematic evidence in the remainder of Table 8. Columns (3)-(4) show that the negative correlation between isolated capitals and the quality of governance is indeed

[33]Our results are also robust to including educational achievement as a control variable, as measured by total years of schooling in 1995 (from the Barro-Lee dataset). We choose not to include it in our main specifications because it is very highly correlated with income per capita (around 0.75 in the full sample), and ends up being statistically insignificant in all specifications. The results are also unaltered if we control directly for population density, which we do not do in the main specifications because we already include a control for population and the adjustment for country size implicit in our measure of concentration. Last but not least, the results are robust to including a comprehensive set of geographical and historical control variables, including an island dummy, length of coastline, date of independence, and presence of natural resources. All of these can be seen in the Online Appendix.

[34]The correlation, as well as all the regression results that follow, are robust to the exclusion of Singapore, which seems to be an outlier in terms of governance among the countries in this subsample.

Table 8: Isolated Capital Cities and Misgovernance

Dependant Variable: WGI PC	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Full Sample		Autocracies		Establ. Democracies		Full Sample	
Avg Log Distance	-0.1610***	-0.1430***	-0.2670***	-0.3219***	-0.0585	-0.0095	-0.0592	-0.0584
	[0.057]	[0.054]	[0.066]	[0.049]	[0.121]	[0.137]	[0.064]	[0.064]
Avg Log Distance X Autocracy							-0.2316***	-0.2420***
							[0.081]	[0.082]
Basic Set of Controls	X		X		X		X	
Full Set of Controls		X		X		X		X
Selection-corrected bound	-0.137	-0.124	-0.260	-0.338			-0.207	-0.235
Observations	127	127	36	36	31	31	127	127
R-squared	0.823	0.830	0.829	0.884	0.898	0.916	0.869	0.870

Robust standard errors in brackets. Z-scores (normalized variables) reported. WGI PC: First Principal Component of Worldwide Governance Indicators measures (Rule of Law, Voice and Accountability, Government Effectiveness, Regulatory Quality, Control of Corruption, Political Stability). Autocracies: Polity <=0; Established Democracies: Polity > 9. Basic Control variables include Log GDP per capita, Log Population, Urbanization, and Region and Legal Origin dummies. Full Set of Controls adds Majoritarian and Presidential system dummies, and Ethnic Fractionalization. Columns (7)-(8) also include Autocracy dummy as control variable. Conservative bounds of effects are calculated following Oster (2013) and Altonji et al (2005) in assuming equal selection on observables and selection on unobservables. *** p<0.01, ** p<0.05, * p<0.1.

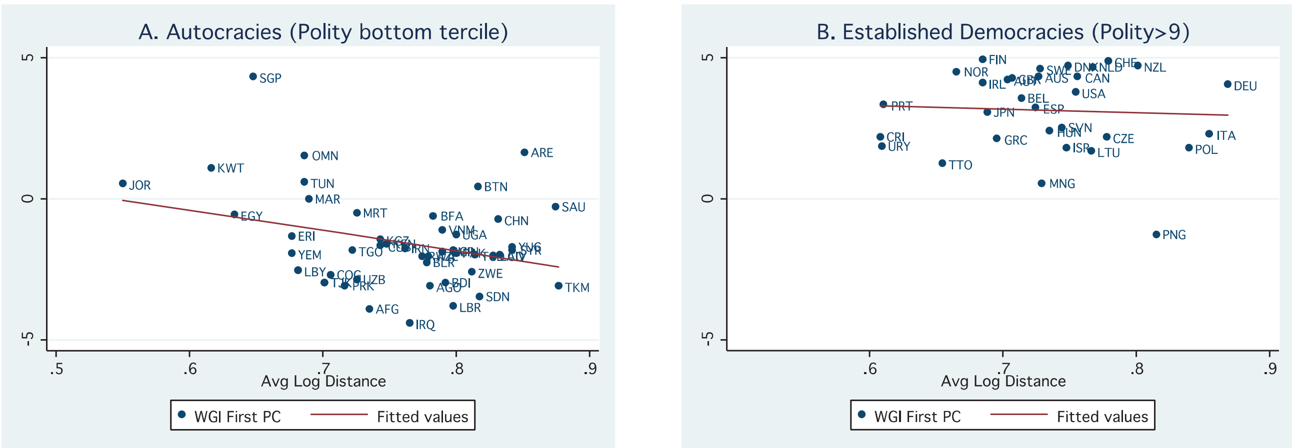


Figure 3: Governance and Isolation of the Capital City: Autocracies vs Established Democracies

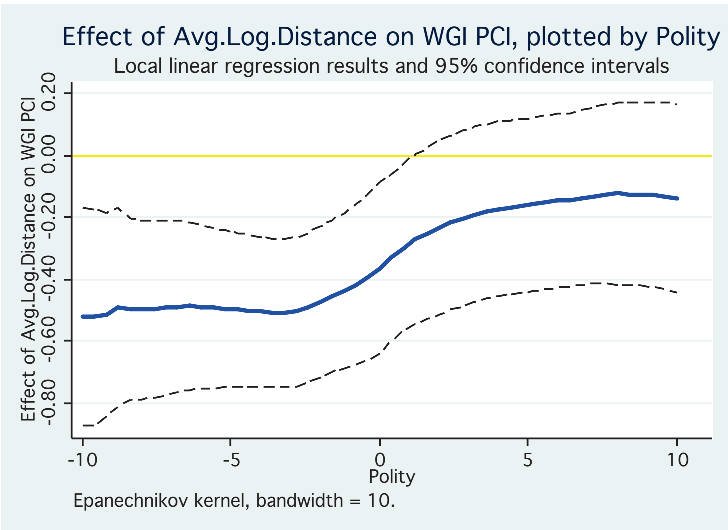
particularly pronounced in the non-democratic countries, in spite of the relatively small sample size. The results are robust to correcting for selection on unobservables, following Oster's (2013) procedure (in the spirit of Altonji, Elder and Taber 2005) assuming that there is as much selection on unobservables as there is selection on observables.[35]

This pattern is in stark contrast with Columns (5)-(6), which show that the correlation is essentially non-existent in countries with established democracies. In fact, in spite of the relatively high standard errors, especially in the sample of democracies, we can specifically reject the hypothesis of equality of coefficients on the concentration of population around the capital across the two subsamples (p-value = 0.0018). Last but not least, Columns (7)-(8) show that the same message is conveyed by the full sample,

[35] Both Oster (2013) and Altonji, Elder and Taber (2005) argue that, in practice, selection on observables is expected to be of a smaller magnitude than selection on unobservables, in which case our results should be even more robust to omitted variable bias.

if we include an interaction term between the isolation measure and an autocracy dummy. Put simply, the key prediction of our model linking isolated capitals and misgovernance is also borne out by the data.

The same pattern can be seen using a more flexible, semi-parametric approach. Specifically, we can model the potentially heterogeneous effect of the isolation of the capital on the quality of governance as a non-parametric function of the Polity measure (denoted as p): $WGI_i = \alpha(p_i) + \beta(p_i) * AvgLogDistance_i + X_i\Gamma + \epsilon_i$, where X_i stands for the basic control variables as in Column (1) of Table 7. For each value of p along a 50-point grid over the $[-10, 10]$ range, we run a local linear regression of WGI_i on $AvgLogDistance_i$, using the Epanechnikov kernel with a bandwidth of 10, to obtain an estimate of $\beta(p)$.[36] The resulting function is plotted in Figure 4. We can see a patern in which a significant negative coefficient is found for relatively autocratic countries, at the lower end of the range, while for the more democratic countries the coefficients are much smaller in absolute value, and statistically indistinguishable from zero. Notably, the threshold falls right around around the Polity score of zero that separates the regimes classified as autocracies and closed anocracies.



Notes: WGI First PC: first principal component of six World Governance Indicators measures (Rule of Law, Voice and Accountability, Government Effectiveness, Regulatory Quality, Control of Corruption, Political Stability). The figure plots the coefficients on Avg Log Distance from local linear regressions with WGI PCI as dependent variable, and Log GDP per capita, Log Population, Urbanization, and Region and Legal Origin dummies as control variables. The size of the grid is 50, with a bandwidth of 10, and we use the Epanechnikov kernel.

Figure 4: Governance and Isolation of the Capital City, by Polity Score

We can also assess the quantitative importance of the correlation. Since we report standardized results, it is easy to interpret the coefficients in Table 6: a one-standard-deviation increase in the isolation of the capital (computed over the distribution for the entire sample) is associated with a decrease in the measured quality of governance of just over 0.3 standard deviation, in the context of the full specification for the

[36]The observed pattern is much similar across a wide range of cross-validated bandwidths (see Li and Racine 2006, ch. 2).

non-democratic subsample (Column (4)). To make this more concrete, consider the thought experiment of increasing the isolation of the capital from about average among autocracies (approximately that of Nairobi in Kenya) to one standard deviation above it (roughly that of Sudan's Khartoum). As it turns out, the quality of governance in Kenya is also measured as about average for our sample of autocracies, whereas Sudan's is among the very worst in the world – better only than Iraq, Afghanistan, and Liberia. The estimated coefficient suggests that the increase in isolation would be associated with a decrease in the quality of governance that corresponds to about 40% of the actual difference between the two countries. This is not a causal estimate of the impact of increasing isolation, of course, and our theory itself is explicit about the presence of reverse causality; still, this suggests that the mechanism linking accountability and isolation via the threat of conflict is important from a quantitative perspective.

4.2.3 Robustness

The association between isolated capital cities and poor governance, as well as the fact that it is present only in relatively non-democratic contexts, also holds under different ways of measuring the degree of isolation of the capital and the quality of governance.

We consider three alternative measures of isolation: (i) the "unadjusted" version of $AvgLogDistance$; (ii) the (log of the) distance between the actual capital and the least isolated place in the country;[37] and (iii) capital primacy, namely the share of the country's population living in the capital city as officially delimited, which is an inverse measure of isolation. The pairwise correlations between these variables and (adjusted) $AvgLogDistance$ in our sample – 0.62, 0.59, and -0.37, respectively – clearly show that the measures are related, as expected, but substantially different nonetheless. In particular, capital primacy is a rather unsatisfactory measure, as it relies on arbitrary definitions of what counts as the capital city and discards all the information on the spatial distribution outside of that arbitrarily delimited city, and the lower correlation underscores that it is indeed noisier. Still, it is sufficiently common so as to warrant checking, for the sake of completeness. As for the quality of governance, we use another measure, the Rule of Law index compiled by Freedom House, which also gives us a sufficiently wide coverage in terms of the number of countries – and particularly of non-democratic ones. (We rescale the index so that higher scores correspond to better governance.)

The results are shown in Table 9. Columns (1)-(4) reproduce the specifications for autocracies and established democracies, respectively from Columns (4) and (6) in Table 8, but looking at unadjusted $AvgLogDistance$ and the distance to the least isolated place, respectively, as key independent variables. In both cases we see a similar negative, statistically significant correlation between isolated capital cities and quality of governance, for the autocracy subsample only. Note that the results are not too far, quantitatively speaking, from what we found in our baseline.

[37] Notably, for most countries the least isolated location is the country's largest city, which often turns out to be the capital city itself. The exceptions are illustrative: in China, it is close to Zhengzhou, the largest city in that country's most populous province (Henan); and similarly for India, where it is also in the most populous state (Uttar Pradesh). In the US, it is Columbus, OH, right in the middle of the large population concentrations of the East Coast and the Midwest.

Table 9: Isolated Capital Cities and Misgovernance: Robustness

Dep. Var.:	(1) WGI PC	(2) WGI PC	(3) WGI PC	(4) WGI PC	(5) WGI PC	(6) WGI PC	(7) FH	(8) FH	(9) WGI PC
	Autocracies	Democracies	Autocracies	Democracies	Autocracies	Democracies	Autocracies	Democracies	Full Sample
Avg Log Distance (unadj.)	-0.4499***	0.1018							
	[0.115]	[0.308]							
Distance Min. Isolation			-0.2277***	0.0364					
			[0.058]	[0.082]					
Capital Primacy					0.1137	-0.1679**			
					[0.070]	[0.076]			
Avg Log Distance							-0.2009**	0.0066	-0.0057
							[0.080]	[0.025]	[0.070]
Avg Log Distance X Autocracy									-0.2736***
									[0.096]
Avg Log Distance (Other Largest)									-0.1489*
									[0.081]
Avg Log Distance (Other Largest) X Autocracy									0.0714
									[0.116]
Selection-corrected bound	-0.474		-0.244		0.0783		-0.227		-0.272
Observations	36	31	34	31	32	31	35	29	126
R-squared	0.859	0.918	0.846	0.918	0.846	0.928	0.611	0.891	0.877

Robust standard errors in brackets. Z-scores (normalized variables) reported. WGI PC (Columns (1)-(6) and (9)): First Principal Component of Worldwide Governance Indicators measures (Rule of Law, Voice and Accountability, Government Effectiveness, Regulatory Quality, Control of Corruption, Political Stability). FH (Columns (7)-(8)): Freedom House Rule of Law Index. Autocracies: Polity <=0, except for Column (5) where the threshold is the median Polity score (<=6); Established Democracies: Polity > 9. Control variables: Log GDP per capita, Log Population, Urbanization, and Region and Legal Origin dummies, Majoritarian and Presidential system dummies, and Ethnic Fractionalization; and Log Land Area and Maximum Distance in the Country (Log of maximum distance (in km) between capital city and any point in the country), for Columns (1)-(4) only. Column (9) also includes Autocracy dummy as control variable. Columns (1), (3), (5), (7) and (9) show the bound from 0 with Oster's (2013) correction when selection by unobservables equals selection by observables. *** p<0.01, ** p<0.05, * p<0.1.

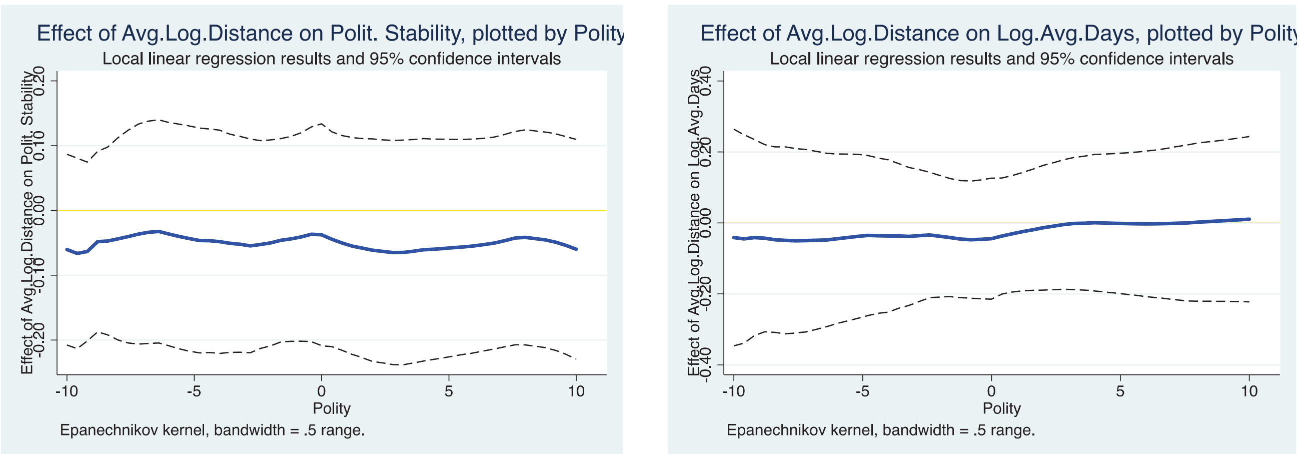
Columns (5)-(6) then consider the coarser measure, capital primacy. Unfortunately, our data on capital city populations is considerably more sparse, so in order to obtain reasonable sample sizes we consider an "autocracy" threshold at the median Polity score in our distribution (equal to 6). This includes what the Polity dataset classifies as "open anocracies" (Polity score between zero and 5), as well as a few less established "democracies". We see a positive coefficient (p-value: 0.122), only for the subsample of autocracies (Column (3)). Note also that the estimated coefficients are considerably smaller and less precisely estimated, consistent with substantial measurement error being introduced by the coarseness of the measure.

In addition, Columns (7)-(8) repeat the same exercise with the Freedom House measure of governance – reverting back to using our standard zero threshold for autocracies, and $AvgLogDistance$ as our key independent variable. The results are very much consistent, which is unsurprising given that the measures of governance are very highly correlated (in excess of 0.80). Still, and particularly with our small samples, it is reassuring to learn that the results are not very sensitive to that choice of measures.

The last column in Table 9 then addresses a different robustness exercise: whether the results are indeed driven by the role of the capital city itself, as opposed to other correlated features of the spatial distribution of population. Specifically, it could be that relatively isolated capital cities often correspond to the existence of a major economic center away from the capital, like Istanbul or São Paulo or Lagos. This could be associated with another elite based in that other city, which might be conducive to misgovernance in different ways – say, through their own predatory behavior, or through disputes with the political elites situated in the capital. In order to check that our results are not driven by this type of mechanism, we compute our measure of isolation $AvgLogDistance$ with respect to the largest city in each country, other than the capital itself (as of 2000).[38] Column (9) shows, using a specification akin to that of Column (8) in Table 6, that our results are essentially unaffected, qualitatively or quantitatively, when we control for the degree of isolation of the other largest city.[39] This suggests that what we find indeed relates to the special role of the capital city.

4.2.4 Unpacking Governance

We can further assess the reach of the explanatory power of the theory by unpacking the different dimensions that go into measures of governance. Consider first the different component measures of the WGI. As we have noted, the six measures are highly correlated with one another, and in light of that one might expect that they would display a similar relationship with the isolation of the capital if considered separately. As it turns out, this is true of five of the six measures, but not for Political Stability. Panel A in Figure 5 shows that the coefficients obtained from local linear regressions are statistically indistinguishable from zero, and with no apparent difference with respect to autocracies versus democracies. This suggests that isolated capital cities are associated with worse governance across all dimensions, except that they are not linked to the political system being less stable.[40]



Panel A | Panel B

Notes: The figure plots the coefficients on Avg Log Distance from local linear regressions with Political Stability and Log Avg Days to return a letter as dependent variables, respectively, and Log GDP per capita, Log Population, Urbanization, and Regional and Legal Origin dummies as control variables. The size of the grid is 50, with a bandwidth of 10, and we use the Epanechnikov kernel.

Figure 5: Political Stability, Log Avg Days, and Isolation of the Capital City, by Polity Score

[38]This is either the country's largest city or, more often, its second largest, since the capital is also the largest city in about five out of six countries. The correlation between the measure and the isolation of the capital city is around 0.53 – substantial but far from overwhelming.

[39]The results are the same if we split the sample between autocracies and established democracies, as shown in the Online Appendix. The coefficient on the isolation of the other largest city in autocracies is small and statistically insignificant.

[40]The plots for the other five measures can be seen in the Online Appendix.

This is not surprising when looked at through the lens of our framework, in which isolating the capital city is a rebellion-preventing measure. In fact, we have pointed out that the simple version of the model in which we take isolation and governance as exogenous implies that more isolated capitals are associated with less conflict and less risk for incumbent elites. Once we consider the interaction between political stability and the choices of degree of isolation and quality of governance, the relationship becomes ambiguous, but in any case we would not expect from our framework that incumbent regimes would necessarily be less stable when the capital is more isolated.[41]

In contrast, this is quite unlike what one would expect from alternative stories that one might concoct to explain the connection between isolated capitals and poor governance, such as one based on state capacity. For the sake of an example, consider a story where, if the capital is somehow located in an isolated place, the state has a harder time taxing its citizens and developing its fiscal capacity, the lack of which leads to bad governance. Besides begging the question of why an incumbent regime would refrain from moving its capital to a more favorable location, such a story about a relative lack of control over the population would lead us to expect that this would be a more fragile, unstable regime.[42]

Another way to unpack the meaning of governance is to look at a measure of government performance that is unrelated, at least directly, to the political incentives of rulers and elites as it pertains to power sharing or political survival. One such measure has been proposed by Chong et al (2014), to isolate the government's ability to perform a simple task effectively: the average number of days it takes a country's post office to return letters sent to non-existent addresses in the countries' five largest cities. This measure ought to be correlated with broader measures of governance.[43] Still, we would not expect it to respond directly to the incentives highlighted by our theory.

Panel B in Figure 6 shows that, in spite of that high correlation with governance, we find no correlation between that measure of government performance and the isolation of the capital city – and again with essentially no distinction between democracies and autocracies. This provides further evidence that the stylized fact we detect is not an artifact of some correlation between isolated capitals and generally low state capacity that is unrelated to the kind of forces our theory underscores.

We now turn to the question of whether we can shed direct light on the power sharing mechanism highlighted by the theory, by looking at the Polity IV data set. We have used the aggregate Polity measure to parse the sample between democracies and autocracies, but the data contain more information that can be used to study more subtle distinctions. In particular, the Polity measure aggregates the content of several other measures – and the extent to which they can be interpreted as relating to the degree of power sharing varies considerably.

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[41] To see why less isolation would not necessarily be associated with less stability in equilibrium, note that it could happen that a relatively unprotected elite would still achieve stability by sharing power and rents more broadly, thus discouraging rebellions.

[42] This is as suggested by Herbst (2000), in a different context, with respect to low population densities in Africa.

[43] For instance, one might imagine that less accountable governments could be more likely to pursue actions that would result in ineffective provision of services – say, by packing the post office with incompetent political appointees. In fact, the raw correlation with the WGI principal component in our sample is substantial, at -0.72.

Out of the four variables aggregated into the Polity IV index of Democracy, two are described as pertaining to either the realm of "independence of executive authority" ($ExecutiveConstraints$) or to that of "political competition and opposition" ($ParticipationCompetitiveness$).[44] These are clearly related to the degree of power sharing that exists within a political system: an unchecked executive and a limited scope for political competition are clear signals of concentration of power.

A first look at how these measures relate to the isolation of the capital city can be had by revisiting the instances of capital city moves that were listed in Table 2. Table 10 reproduces that list, excuding the cases of partial capital moves, but also adding two columns describing the changes in $ExecutiveConstraints$ and $ParticipationCompetitiveness$ from ten years before to ten years after the date of the move (or closest date available). We see a substantial drop in the two measures, on average, which is indeed statistically distinguishable from zero in the case of $ParticipationCompetitiveness$, in spite of the very small sample. This indicates that the capital city moves are typically accompanied by more concentrated power.

Table 10: Changes in Capital Cities and Power Sharing

Country	From	To	Year	*Δ Exec. Constr.*	*Δ Part. Comp.*
Russia	St. Petersburg	Moscow	1918	1	-2
Turkey	Istanbul	Ankara	1923	-2	-1
Australia	Melbourne	Canberra	1927	0	0
China	Nanjing	Beijing	1949	1	-2
Mauritania	-	Nouakchott	1957	-2	0
Brazil	Rio de Janeiro	Brasilia	1960	-4	-2
Rwanda	Butare	Kigali	1962	0	0
North Yemen	Ta'izz	Sana'a	1962	2	-1
Pakistan	Karachi	Islamabad	1966	0	0
Malawi	Zomba	Lilongwe	1974	0	0
Cote d'Ivoire	Abidjan	Yamoussoukro	1983	1	1
Nigeria	Lagos	Abuja	1991	-2	-3
Kazakhstan	Almaty	Astana	1997	-1	-1
Myanmar (Burma)	Yangon	Naypyidaw	2005	-1	0
Average				*-0.50*	*-0.79*
p-value				*0.266*	*0.021*

Excluding partial changes. For sources and notes, see Table 2. Changes in Polity IV variables ("Executive Constraints" and "Participation Competitiveness") are between 10 years after and 10 years before change of capital, with the exception of Mauritania, Rwanda, and Kazakhstan ("pre" measure for first year of independence) and Myanmar (Burma) ("post" measure for 2010, latest available). P-values for two-sided t-test of null hypothesis of Average equal to zero, with 13 degrees of freedom.

This pattern actually holds more systematically, beyond the extreme example of capital city moves. Table 11 starts off, in Column (1), by looking at the aggregate Polity measure and how it relates to the degree of isolation in autocracies. Here we extend the definition of non-democracies to include what Polity defines as "open anocracies", delimited by the threshold score of 5, because there is naturally considerably less variation in the Polity components in the subset of autocracies and closed anocracies. We see a negative correlation, showing that countries with isolated capital cities tend to display institutions that are farther from the democratic ideal; the correlation is statistically significant at the 10% level only. The connection is brought into sharper focus, however, when we look at the power sharing measures of

[44] The former refers to "the extent of institutionalized constraints on the decisionmaking powers of chief executives" (Marshall, Jaggers, and Gurr 2011, p. 24), ranging from "unlimited authority" to "executive parity or subordination". The latter in turn captures "the extent to which alternative preferences for policy and leadership can be pursued in the political arena" (p. 26), and ranges from "repressed" to "competitive".

$ExecutiveConstraints$ and $ParticipationCompetitiveness$, in Columns (2) and (3) respectively. The quantitative implications are in fact very similar to what we found for our measures of governance.

Table 11: Isolated Capital Cities and Power Sharing in Autocracies

Dep. Var.:	(1) Polity	(2) Executive Constraints	(3) Particip. Compet.	(4) Recruit. Compet.	(5) Recruit. Openness
Avg Log Distance	-0.1831*	-0.2123***	-0.3249***	-0.0554	0.1715
	[0.109]	[0.073]	[0.084]	[0.097]	[0.225]
Selection-corrected bound	-0.325	-0.288	-0.414		
Observations	63	63	63	63	63
R-squared	0.450	0.622	0.533	0.541	0.288

Robust standard errors in brackets. Z-scores (normalized variables) reported. Autocracies: Polity<=5. Control variables: Log GDP per capita, Log Population, Urbanization, Region and Legal Origin dummies, Majoritarian and Presidential system dummies, and Ethnic Fractionalization. Columns (1) to (3) include the bound from 0 with Oster's (2013) correction when selection by unobservables equals selection by observables. *** p<0.01, ** p<0.05, * p<0.1.

Interestingly, Columns (4)-(5) show no evidence of a negative link between isolated capital cities and the other two component measures ($RecruitmentCompetitiveness$ and $RecruitmentOpenness$), which have to do with "executive recruitment".[45] The measure of openness in particular, while clearly related to democracy, does not speak directly to how power is shared between different groups in society: countries receive a maximum score in the openness measure essentially as long as succession is not hereditary.[46] Naturally, all four measures tend to be correlated, so that countries with high degrees of power sharing will typically score high in the recruitment measures as well. It is nevertheless interesting that $RecruitmentOpenness$ is the least correlated with the other three, and particularly so with the power sharing measures: 0.59 and 0.47, when the pairwise correlations between the other three is never below 0.83. This suggests that it indeed addresses other aspects of the institutional setting.

4.3 Additional Predictions

Beyond the central implications of the model, with respect to conflict and quality of governance, we can also check its ancillary predictions. We first look at the prediction that capital city inhabitants will be better off relative to their faraway brethren, since the greater threat they represent for incumbents enables them to extract additional rents in equilibrium, and that this advantage will be greater when the capital is more isolated.[47]

[45] In spite of the small samples, the equality of coefficients between combinations of Columns (2)-(3) and Columns (4)-(5) can be decisively rejected at standard levels of confidence, with the exception of that between Columns (2) and (4).

[46] This allows, for instance, the post-Stalin Soviet Union, no one's idea of a regime with widespread power sharing, to achieve that maximum score.

[47] We find related evidence that individuals who live closer to the capital report being more satisfied with what they get from national institutions, which we report in the Appendix to save space. That table uses data from the AfroBarometer, which report information on the location of respondents, at the village level, and covers countries that are young democracies at best, where the logic of our model is a meaningful background in their institutional settings. Individuals who live farther

To check this prediction, we obtain cross-country data, from the McKinsey Global Institute (Dobs et al. 2011), on city-level income per capita, in 2007, for 600 cities around the world. Out of these, 77 are country capitals, and for all these countries we compute the capital city premium as the ratio between the capital's income per capita and the countrywide GDP per capita that we have used in the previous analysis. By the same token, we proxy investment in military strength by the amount of military expenditures pursued by a country's central government, as a percentage of total central government expenditures, averaged between 1990 and 2006 (from the World Development Indicators).[48]

Table 12 displays the results of a simple regression analysis along the lines of Table 8. The aforementioned data caveats aside, we see a positive, quantitaively large correlation between the capital city premium and the isolation of the capital in autocracies. In other words, the inhabitants of isolated capital cities of autocratic countries earn a substantially larger premium over the rest of the population. This is exactly what was predicted by our model. It could certainly be the case that omitted factors are also influencing this correlation, but it is telling that once again, as shown by Columns (2)-(3), this connection does not extend to those countries that are more democratic, just as we would expect from our framework.

Table 12: Isolated Capital Cities, Capital Premium, and Military Expenditures

Dep. Var.:	(1) Capital Premium	(2) Capital Premium	(3) Capital Premium	(4) Military Budget	(5) Military Budget	(6) Military Budget
	Autocracies	Democracies	Full Sample	Autocracies	Democracies	Full Sample
Avg Log Distance	**0.4158*** **	-0.1040	-0.0287	**-0.3393*** **	-0.0150	0.0986
	[0.141]	[0.209]	[0.148]	**[0.124]**	[0.133]	[0.116]
Avg Log Distance X Autocracy			**0.4096** **			**-0.3912** **
			[0.197]			**[0.169]**
Interstate War				0.4441*	0.6072**	0.5975***
				[0.247]	[0.235]	[0.192]
Selection-corrected bound	0.475		0.466	-0.716		-0.714
Observations	32	32	64	55	51	106
R-squared	0.398	0.436	0.409	0.382	0.477	0.418

Robust standard errors in brackets. Z-scores (normalized variables) reported. Dependent variables are GDP per capita in capital city / GDP per capita and Military Budget (Log of Share of Central Government Budget, avg. 1990-2006, WDI). Interstate War is dummy for involvement in interstate war between 1975 and 2007 (Correlates of War). Autocracies: Polity (1975-2000) ≤0; Democracies: Polity (1975-2000) >0. Control variables include Log GDP per capita, Log Population, Urbanization, Majoritarian and Presidential system dummies, and Ethnic Fractionalization. Columns (1), (3), (4) and (6) show the bound from 0 with Oster's (2013) correction when selection by unobservables equals selection by observables. *** p<0.01, ** p<0.05, * p<0.1

from the capital are significantly more dissatisfied with the national political system (Panel A). (This is true controlling for distance to the largest city besides the capital, and for region fixed effects, which suggests that they are not driven by the effects of isolation on monitoring or public good provision. We also control for a comprehensive set of control variables flagged by Nunn and Wantchekon (2011) as possibly correlated with trust.) In contrast, distance to the capital is uncorrelated with measures of generalized trust and of the the degree of interest and information regarding public affairs, which could also be correlated with perceptions of corruption (Panel B).

[48]The sample size is now smaller, in light of the limited number of countries for which we have data on income per capita for the capital city (particularly among non-democracies), so we now split the sample between autocracies and democracies according to the average of the Polity score between 1975 and 2000, using the threshold of zero. (We stop at 1975 in order to restrict ourselves to the post-decolonization period.) This helps us obtain a reasonable sample size of autocracies, in contrast with the more recent time period used in Tables 8 and 9. On the other hand, going back to this less democratic period greatly restricts the sample of countries with a Polity score above 9. For this reason, we contrast the autocracy sample with the set of countries with scores above zero. All in all, we are still left with a small sample, and for that reason we have to be especially parsimonious when it comes to the set of control variables.

Table 12 also shows that autocratic regimes facing a population that is more concentrated around its capital city will spend significantly more with the military than regimes with isolated capitals. This is exactly in line with the model's prediction: isolated capital cities work as protection against rebellion threats, and hence obviate the need for further protection. The same is not at all true of relatively democratic regimes, which again reaffirms the model's logic.[49]

5 Concluding Remarks

Our results underscore the importance of the spatial distribution of the population as a source of informal checks and balances over autocratic regimes. In particular, isolated capitals in weakly institutionalized contexts should be seen as both a symptom and an enabler of misgovernance. We should thus be especially attentive to those regimes that are able to ensconce themselves in an isolated capital, as well as to policies that enhance that ability, say by restricting internal mobility. At the same time, the model also highlights that this accountability mechanism comes at a price, since it operates via the threat of conflict and violent removal from office.[50]

From a broader perspective, we can think of the spatial distribution of individuals as a source of variation in the constraints that underpin institutional choices, but one that perhaps strikes a middle ground between what Banerjee and Duflo (2014) term "deterministic" and "non-deterministic" views of political economy: the spatial distribution of population is typically very persistent, but is certainly amenable to policy intervention, and does evolve in the long run. In that sense, long-run forces towards less isolation– say, because the capital city is a pole of attraction due to its very role as the seat of political power – would tend to constrain governments, and work towards the consolidation of better institutions.

The framework we have developed can presumably be used to understand other phenomena related to the threat of revolutions and the response of incumbent regimes. In this paper, the variable that affects the extent to which an individual or group represents danger to an incumbent elite is their distance to the seat of political power, but we can think of other factors that may act in similar ways – say, education (Glaeser, Ponzetto, and Shleifer 2007). In such a context, we could sketch a theory of incumbent regimes that may choose to pair less power sharing and worse governance with, say, less human capital.

As a final example, we can also think about the formation and size of countries. Our framework has taken polities as given, but it is natural to think that the tensions we have highlighted could translate into pressures in the direction of breaking up countries. In that sense, we might think about the potential role of the spatial distribution of population (and of different subgroups in that population) around the capital city in affecting the equilibrium configuration of countries, as modeled for instance by Bolton and Roland (1997) and Alesina and Spolaore (2003). We leave these as promising avenues for future research.

[49]The use of military spending as our proxy for anti-rebellion investment is predicated on the assumption that it is largely driven by this sort of domestic concern. In that regard, we include as a control variable a dummy for whether the country has been involved in an interstate conflict between 1975 and 2007, as coded by the Correlates of War dataset.

[50]See e.g. Campante and Glaeser (2009), on the case of Argentina.

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A Online Appendix: A simple model of rebellions

Here we provide a simple set of microfoundations for the reduced-form model of conflict described in Section 3.1.1. Suppose the cost for an agent to fight against the incumbents is given by

$$(c_i + d_j)w_i$$

where c_i is a group specific random variable, d_j is an individual specific random variable with p.d.f $\tilde{g}$ and c.d.f. $\tilde{G}$ and w_i is the income of an individual in group i. This captures the idea that fighting entails an opportunity cost, as agents could instead spend their time and energy working, so the cost is proportional to their income. As in models of voting, it is not clear why an individual bothers to fight since it is extremely unlikely his efforts will be pivotal, but it is reasonable to assume that the benefit from fighting is proportional to the gain in case the rebellion succeeds:

$$a(y^* - w_i)$$

It follows that individuals will fight if:

$$d_j < a\left(\frac{y^*}{w_i} - 1\right) - c_i$$

Suppose there is conflict if the measure of agents that is willing to fight in a given group (call it A_i) exceeds a bound $\underline{D}$, which captures the idea that a minimum disturbance is needed for conflict to be recorded in the data. Suppose also that conflict succeeds if $A_i > D_i$, where D_i is a random variable that captures how difficult it turns out to be for a group to win the fight, $D_i \sim (\underline{D}, \overline{D})$.

Hence there is conflict if

$$\frac{y^*}{w_i} - 1 - \frac{c_i}{a} - \frac{1}{a}\tilde{G}^{-1}(\underline{D}) > 0 \tag{11}$$

and conflict succeeds if

$$\frac{y^*}{w_i} - 1 - \frac{c_i}{a} - \frac{1}{a}\tilde{G}^{-1}(\underline{D}) > \frac{1}{a}\left(\tilde{G}^{-1}(D_i) - \tilde{G}^{-1}(\underline{D})\right) \tag{12}$$

Assuming that c_i is larger for groups in faraway places, $\frac{c_i}{a} + 1 + \frac{1}{a}\tilde{G}^{-1}(\underline{D})$ can be written as $T\ell_\imath + \chi_\imath$ and the LHS of (11) and (12) become the expression for γ_i in the main text. Moreover, $\left(\tilde{G}^{-1}(D_i) - \tilde{G}^{-1}(\underline{D})\right)$ equals to 0 for $D_i = \underline{D}$ and is increasing in D_i, so the RHS of (12) satisfies the properties of the function π in the main text. The shape of function π then depends on the distribution of individual-specific shocks $\tilde{G}$ and on the distribution of D_i which captures the randomness involved in any conflict.

B Online Appendix: Proofs

B.1 Proof of Proposition 1

Given the conflict technology, the objective function of the incumbent elite is given by:

$$\mathcal{R} = \frac{1}{p}\left(Y^* - \sum_{\imath=1}^{n} w_\imath\right)\prod_{\imath=1}^{n} H(\widehat{\chi}_\imath),$$

where the term in brackets are the rents incumbents obtain conditional on keeping power, to be shared among the measure p of incumbents, and $H(\widehat{\chi}_\imath)$ denotes the probability that they are not overthrown by group $\imath$. The trade-off is that a smaller $w_\imath$ implies higher rents for the incumbents in case they keep their power, but raises the risk of a successful rebellion. Using (2), we can rewrite the objective function as:

$$\mathcal{R} = \frac{1}{p}\left(Y^* - \sum_{\imath=1}^{n} \frac{y^*}{\widehat{\chi}_\imath + T\ell_\imath}\right)\prod_{\imath=1}^{n} H(\widehat{\chi}_\imath) \tag{13}$$

The optimal incumbents' choice can thus be simply represented by a set of thresholds $\widehat{\chi}_\imath$: the incumbents decide how much each group is to be squeezed in equilibrium.

Taking the derivative of (13) with respect to $\widehat{\chi}_\jmath$ and rearranging yields:

$$\frac{\partial \mathcal{R}}{\partial \widehat{\chi}_\jmath} = \frac{1}{p}\left(\prod_{\kappa=1}^{n} H(\widehat{\chi}_\kappa)\right)\left[\frac{y^*}{(\widehat{\chi}_\jmath + T\ell_\jmath)^2} - \left(Y^* - \sum_{\imath=1}^{n} \frac{y^*}{\widehat{\chi}_\imath + T\ell_\imath}\right)\frac{h(\widehat{\chi}_\jmath)}{H(\widehat{\chi}_\jmath)}\right] \tag{14}$$

where $h(\widehat{\chi}_\jmath)$ is given by (3).

We first show there is at most one set of $\{\widehat{\chi}_\imath\}$ such that the expression in (14) is equal to 0 for all groups $\imath$. For that, the terms outside square brackets can be ignored from the analysis. Since h/H is an increasing function, $\partial\mathcal{R}/\partial\widehat{\chi}_\jmath$ is decreasing in $\widehat{\chi}_\jmath$, and increasing in the sum inside (14) involving all $\widehat{\chi}_\imath$ (ignoring the terms outside square brackets).

Consider the values $\widehat{\chi}_\imath$ such that the expression in (14) is equal to 0 for all groups $\imath$. Consider now a change to a different the set of values $\tilde{\chi}_\imath$ and suppose that the expression in (14) is also equal to 0 for all groups $\imath$. First, consider the case the sum inside (14) is larger for the set $\tilde{\chi}_\imath$ (than for the set $\widehat{\chi}_\imath$). Since $\partial\mathcal{R}/\partial\widehat{\chi}_\jmath$ is decreasing in $\widehat{\chi}_\jmath$ and increasing in the sum, it has to be that $\tilde{\chi}_\jmath > \widehat{\chi}_\jmath$ in order to make the expression in (14) equal to 0, for all $\jmath$. But that implies that the sum inside (14) is smaller for the set $\tilde{\chi}_\imath$, which is a contradiction. The arguments for when the sum inside (14) is smaller or equal for the set $\tilde{\chi}_\imath$ are analogous.

Incumbents will never choose $\widehat{\chi}_\jmath = \underline{\chi}$ for any $\jmath$. It can be seen from (14) that $\partial\mathcal{R}/\partial\widehat{\chi}_\jmath$ is positive in case $\widehat{\chi}_\jmath = \underline{\chi}$ for any $\jmath$.

Inspection of (14) then shows that the marginal effect of $\widehat{\chi}_\jmath$ on $\mathcal{R}$ is the same for two groups with the same $\ell_\jmath$. Hence incumbents choose the same $\widehat{\chi}_\jmath$ for two groups in the same location.

Let $\widehat{\chi}_F$ be the optimal choice of $\widehat{\chi}_\kappa$ for a group $\kappa \in \mathscr{F}$. The expression in (14) then implies that $\frac{\partial\mathcal{R}}{\partial\widehat{\chi}_\jmath} > 0$ for a group $\jmath \in \mathscr{C}$ for any $\widehat{\chi}_\jmath \le \widehat{\chi}_\kappa$. Therefore, unless $\widehat{\chi}_\kappa = \overline{\chi}$, it is optimal for incumbents to choose $\widehat{\chi}_\jmath > \widehat{\chi}_\kappa$.

The first statement from Proposition 1 follows immediately, since the cumulative distribution function F is increasing in $\widehat{\chi}_\jmath$. The second statement follows from H being decreasing in $\widehat{\chi}_\jmath$, since the probability of a successful rebellion is given by the function $1 - H$.

For the third statement, note that an increase in $\ell_\imath$ for any $\imath$ reduces the sum inside (14), and thus shifts down the derivative in (14). This leads to a lower $\widehat{\chi}_\jmath$ at the point $\partial\mathcal{R}/\partial\widehat{\chi}_\jmath = 0$. An increase in $\ell_\jmath$ decreases the first term in brackets, which also leads to a decrease in the derivative in (14) and a lower $\widehat{\chi}_\jmath$ at $\partial\mathcal{R}/\partial\widehat{\chi}_\jmath = 0$. Using the first two statements from Proposition 1, that implies a reduction in the risk of conflict and in the risk of a successful conflict.

Finally, since $\widehat{\chi}_C > \widehat{\chi}_F$ and h/H is increasing, $h(\widehat{\chi}_C)/H(\widehat{\chi}_C) > h(\widehat{\chi}_F)/H(\widehat{\chi}_F)$. Using (14), $y^*/(\widehat{\chi}_C)^2 > y^*/(\widehat{\chi}_F + T)^2$. Using the expression for income implicit in (2), we get that the income of those in $\mathscr{C}$ is larger than the income of those in $\mathscr{F}$.

To complete the proof of the fourth statement, we show by contradiction that an increase in T leads to an increase in w_C and a decrease in w_F. Consider an increase in T, and first suppose w_C decreases. Since $w_C = y^*/\widehat{\chi}_C$, that implies $\widehat{\chi}_C$ increases. Hence the sum term in (14) must have increased. But an increase in the sum term in (14) leads to a decrease in w_F. An increase in T also leads to a decrease in w_F (owing to h/H being increasing). Hence w_F must have decreased. But a fall in w_C and w_F implies a fall in the sum term in (14), which is a contradiction. Second, suppose w_F increases. Since w_C has also increased, the sum term in (14) must have increased as well. That means $\widehat{\chi}_C$ must have increased, thus w_C must have decreased, which is another contradiction.

B.2 Proof of Lemma 1

Output in the economy is given by (4), so incumbents maximize:

$$\mathcal{R} = \frac{1}{p}\left(A(p)(Y^* - \phi(\Delta\ell)) - \sum_{\imath=1}^{n} \frac{y^*}{\widehat{\chi}_\imath + T\ell_\imath}\right)\prod_{\imath=1}^{n} H(\widehat{\chi}_\imath) \tag{15}$$

To understand the trade-offs facing the incumbents in this setting, let us consider the relevant first-order conditions. Taking the first-order condition with respect to p and manipulating yields:

$$\frac{pA'(p)}{A(p)} = 1 - \frac{\sum_{\imath=1}^{n} \frac{y^*}{\widehat{\chi}_\imath + T\ell_\imath}}{A(p)\,(Y^* - \phi(\ell - \ell^*))} \tag{16}$$

The LHS is the elasticity of productivity with respect to the quality of governance, and corresponds to the marginal benefit of the latter: a larger p leads to greater productivity, and hence more output. The RHS in turn amounts to the share of output that goes to the incumbent elite as rents, which have to be shared among more people when p

increases: the cost of good governance for the incumbents is the need for sharing rents. Note that the isolation of the capital city affects this trade-off, because it affects how much has to be left by the elite to citizens.

By the same token, differentiating $\mathcal{R}$ in (15) with respect to $\ell_\jmath$ yields:

$$\frac{\partial \mathcal{R}}{\partial \ell_\jmath} = \frac{1}{np} \prod_\imath H(\widehat{\chi}_\imath) \left(-A(p)\phi'(\Delta\ell) + ny^* \frac{T}{(\widehat{\chi}_\jmath + T\ell_\jmath)^2} \right)$$

In consequence, $\ell_\jmath$ is given by:

$$A(p)\phi'(\Delta\ell) = ny^* \frac{T}{(\widehat{\chi}_\jmath + T\ell_\jmath)^2} \tag{16}$$

The LHS of (16) shows the marginal efficiency cost of further isolating the capital. The RHS of (16) in turn displays the marginal benefit of the extra protection bought by that isolation: a more isolated capital makes it cheaper to stave off rebellion, as citizens who are farther away represent a lesser threat and can thus receive a lower level of consumption. Note that the quality of governance affects this trade-off: the more productive the economy, the larger the absolute costs of further isolation.

An argument similar to the proof of the fourth statement of Proposition 1 shows that income is decreasing in $\ell_\jmath$ and that the last term in the expression for $\partial\mathcal{R}/\partial\ell_\jmath$ (Equation 17) is decreasing in $\ell_\jmath$. Consequently, there cannot be $\ell_\jmath > \ell_\kappa$ for groups $\jmath$ and κ because increasing $\ell_\jmath$ and reducing ℓ_κ by the same amount and keeping everything else unchanged would increase $\mathcal{R}$. Thus $\ell_\imath = \ell$ for all groups $\imath$. An argument similar to the used in Proposition 1 then shows that $\widehat{\chi}_\imath = \widehat{\chi}$ for all $\imath$.

The optimality condition in (16) can then be written as:

$$\phi'(\Delta\ell) = ny^* \frac{T}{A(p)(\widehat{\chi} + T\ell)^2} \tag{17}$$

The LHS of (17) is increasing in $\Delta\ell$. The RHS is increasing in T if $\widehat{\chi} > T$, which is implied by the assumption $\underline{\chi} > T$. Hence for given p and $\widehat{\chi}$, $\Delta\ell$ is increasing in T. Moreover ℓ is also increasing in ℓ^* (for given p and $\widehat{\chi}$) for suppose not: then an increase in ℓ^* would lead to a lower (or equal) ℓ and thus a larger RHS of (17) but a lower $\Delta\ell$ and thus a larger LHS of (17), which is a contradition.

For the second statement, note that the optimality condition in (16) can be written as:

$$A(p) - pA'(p) = \frac{ny^*}{(\widehat{\chi} + T\ell)(Y^* - \phi(\ell - \ell^*))} \tag{18}$$

The LHS of (18) in increasing in p and the RHS is decreasing in T and ℓ^* for given ℓ and $\widehat{\chi}$, which proves the claim.

B.3 Proof of Proposition 2

First consider a change in T. The effect of T on p is given by:

$$\frac{dp}{dT} = \frac{\partial p}{\partial T} + \frac{\partial p}{\partial \ell}\frac{d\ell}{dT} + \frac{\partial p}{\partial \widehat{\chi}}\frac{d\widehat{\chi}}{dT} \tag{19}$$

The partial derivative of p with respect to T is negative (Lemma 1). The last term in (19) becomes unimportant as the variance of f approaches zero. In order to show that the partial derivative of p with respect to ℓ is also negative, we need to show that the RHS of (18) is decreasing in a change in ℓ in a neighborhood of the optimal $\Delta\ell$. That is the same as showing that

$$(\widehat{\chi} + T(\ell))(Y^* - \phi(\ell - \ell^*))$$

is increasing in $\Delta\ell$. Differentiating this expression with respect to ℓ yields:

$$-(\widehat{\chi} + T\ell)\phi'(\Delta\ell) + (Y^* - \phi(\Delta\ell))T$$

Using the first order condition with respect to $\Delta\ell$ and rearranging leads to

$$\frac{T}{A(p)}\left[A(p)(Y^* - \phi(\Delta\ell)) - \frac{ny^*}{\widehat{\chi} + T\ell}\right]$$

which is positive (since incumbents can get positive rents).

The effect of T on ℓ is given by:

$$\frac{d\ell}{dT} = \frac{\partial \ell}{\partial T} + \frac{\partial \ell}{\partial p}\frac{dp}{dT} + \frac{\partial \ell}{\partial \widehat{\chi}}\frac{d\widehat{\chi}}{dT}$$

The partial derivative of ℓ with respect to T is positive (Lemma 1). The partial derivative of ℓ with respect to p is negative, because the RHS of (17) is decreasing in the productivity of the economy $A(p)$. The last term becomes unimportant as the variance of f approaches zero.

As the variance of f approaches zero, the derivatives dp/dT and $d\ell/dT$ are given by a system of two equations that yields the claim. An increase in T has a direct negative effect on p and a direct positive effect on ℓ. The indirect effects reinforce the direct effects. This argument assumes a vanishing variance of f but by continuity, the result goes through as long as the variance of f is small enough.

Now consider a change in ℓ^*. The effect of ℓ^* on ℓ is given by:

$$\frac{d\ell}{d\ell^*} = \frac{\partial \ell}{\partial \ell^*} + \frac{\partial \ell}{\partial p}\frac{dp}{d\ell^*} + \frac{\partial \ell}{\partial \widehat{\chi}}\frac{d\widehat{\chi}}{d\ell^*}$$

The partial derivative of ℓ with respect to ℓ^* is positive (Lemma 1). The partial derivative of ℓ with respect to p is negative, as argued above. The last term becomes unimportant as the variance of f approaches zero.

The effect of ℓ^* on p is given by:

$$\frac{dp}{d\ell^*} = \frac{\partial p}{\partial \ell^*} + \frac{\partial p}{\partial \ell}\frac{d\ell}{d\ell^*} + \frac{\partial p}{\partial \widehat{\chi}}\frac{d\widehat{\chi}}{d\ell^*}$$

The partial derivative of p with respect to ℓ^* is negative (Lemma 1). The last term becomes unimportant as the variance of f approaches zero. As argued above, the partial derivative of p with respect to ℓ is also negative.

Again, as the variance of f approaches zero, the derivatives $dp/d\ell^*$ and $d\ell/d\ell^*$ are given by a system of two equations that yields the claim. An increase in ℓ^* has a direct negative effect on p and a direct positive effect on ℓ and the indirect effects reinforce the direct effects. The argument assumes a vanishing variance of f but by continuity, the result goes through as long as the variance of f is small enough.

B.4 Proof of Proposition 3

Rents received by each individual in power are now given by:

$$\mathcal{R} = \frac{1}{p}\left(A(p)(Y^* - \phi(\Delta\ell)) - \delta(D) - \sum_{\imath=1}^{n}\frac{y^*}{\widehat{\chi}_\imath + T\ell_\imath + D}\right)\prod_{\imath=1}^{n} H(\widehat{\chi}_\imath).$$

Taking the derivative with respect to D, making $\ell_\imath = \ell$ and $\widehat{\chi}_\imath = \widehat{\chi}$ for all $\imath$ (Appendix B.2) and rearranging yields:

$$\delta'(D) = \frac{y^*}{\widehat{\chi} + T\ell + D}$$

This expression implicitly defines D and it is easy to verify D is decreasing in $\widehat{\chi}$, T and ℓ. If the variance of f is arbitrarily small, so is the effect of T and ℓ^* on $\widehat{\chi}$. The results in Proposition 2 also hold in the model with endogenous repression, so ℓ is increasing in T and ℓ^*. That yields a negative correlation between D and ℓ.

C Online Appendix: Data

Cell-level conflict data: Cell-level data are from the PRIO-GRID dataset (Tollefsen Strand Buhaug, 2012) (Advanced Conflict Data Catalogue (ACDC) project). Conflict data from 1989 to 2008 are from Hallberg (2012). The dummy variable $CivConf$ specifies whether a cell lies within a conflict area in a particular year. Conflict onset data are from Gleditsch et al (2002), covering the period 1946-2005: the dummy variable *Onset* indicates the year a conflict starts in a cell. Data and detailed coding instructions are available at `http://www.prio.org/Data/PRIO-GRID/`.

Other cell-level data: Cell-level data from the PRIO-GRID dataset also include gross product per cell estimated from nighttime luminosity, population per cell (both available in 1990, 1995, 2000 and 2005 only), distance to border, distance to capital city, travel time to closest urban area (2008) (those variables are calculated from GIS maps), infant mortality rates (2000), proportion of mountain area (2000), proportion of forest (2000), precipitation, and draught. Data references are available at `http://www.prio.org/Data/PRIO-GRID/`.

Regime Change: Based on the variable *REGTRANS* (Regime Transition), from Polity IV project, meant to capture "regime change" defined simply as a three-point change in either the politys democracy or autocracy score. We compute a dummy equal to one if *REGTRANS* is different from zero.

Avg Log Distance: We compute the index using original gridded population maps from the database *Gridded Population of the World* (GPW), Version 3 from the Socio-Economic Data Center (SEDC), Columbia University (2005), containing maps in 1990, 1995 and 2000 of a global grid of 2.5 arc-minute side cells (approximately 5km). The adjusted and unadjusted measures are defined respectively as $1 - GCISC_2$ and $1 - GCISC_1$, as defined in Campante and Do (2010). Specifically, we have the formula $GCISC_1 = \sum_i s_{1i} \left(\alpha_1 \log(d_i) + \beta_1\right)$, where s_{1i} is the share of the country's population living in cell i and d_i is the distance between cell i's centroid and the point of interest (e.g. capital city). The parameters (α_1, β_1) are $\left(-\frac{1}{\log(\bar{d}_1)}, 1\right)$, where $\bar{d}_1$ is the maximum distance, across all countries, between a country's capital (or other point of interest) and another point in that country. By the same token, $GCISC_2 = \sum_i s_{2i} \left(\alpha_2 \log(d_i) + \beta_2\right)$, where s_{2i} is the share of the country's population living in cell i, normalized by $\log(\bar{d}_2)$, where $\bar{d}_2$ is the maximum distance, for each country, between the country's capital (or other point of interest) and another point in that country. The parameters (α_2, β_2) are $(-1, 1)$. In this way, $GCISC_2$ controls for the country's size, while $GCISC_1$ does not.

With respect to countries with multiple capital cities, our general rule is to consider the de facto capital as being the site of the executive and the legislature. For instance, this means that we take the capital of the Netherlands to be The Hague (instead of Amsterdam) and the capital of Bolivia to be La Paz (and not Sucre). We leave South Africa out of the sample, since the executive and legislature have always been in different cities, while keeping Chile because the legislative moved more recently (1990). As far as changes in capital cities during our sample period, we have the cases of Myanmar (2005) and Kazakhstan (1997). We drop both from the sample.

Capital Primacy Share of the capital city population over the total population, from the SEDC. Most of the data refer to the period 2000-2002, although many countries have earlier dates.

Distance from Maximum Concentration: This variable is calculated for each country by measuring the distance between the actual site of the capital city, and the site of the capital that would maximize the GCISC. The maximization is done with Matlab's large scale search method (with analytical gradient matrix), from a grid of 50 initial guesses evenly distributed on the country's map for large countries.

World Governance Indicators (WGI): From Kaufman, Kraay, and Mastruzzi (2010), including Voice and Accountability, Control of Corruption, Rule of Law, Government Effectiveness, Political Stability, and Regulation Quality, themselves a composite of different agency ratings aggregated by an unobserved components methodology. On a scale of -2.5 to 2.5. Data are available for 1996-2002 at two-year intervals, and thereafter on an annual basis. We average the data, for each country, for the period 1996-2012. The data are available at: http://info.worldbank.org/governance/wgi/index.asp

Freedom House: Political Rights index (Freedom House). The original data are on a scale of 1 (best) to 7 (worst), which we re-scale, by subtracting from 8, so that higher scores indicate better governance. Average between 1990 and 1999.

Real GDP per capita: From the World Bank World Development Indicators (WDI). Real PPP-adjusted GDP per capita (in constant 2000 international dollars).

Population: From WDI.

Polity: Polity IV composite score as Democracy minus Autocracy, on a scale of -10 to 10, from Polity IV project.

Ethno-Linguistic Fractionalization: From Alesina et al. (2003).

Legal Origin: From La Porta et al. (1999). Dummy variables for British, French, Scandinavian, German, and socialist legal origin.

Region dummies: Following the World Bank's classifications, dummy variables for: East Asia and the Pacific; East Europe and Central Asia; Middle East and North America; South Asia; West Europe; North America; Sub-Saharan Africa; Latin America and the Caribbean.

Executive Constraints: Variable *XCONST* (Executive Constraints), from Polity IV project, averaged between 1975-2010, with transition years coded as missing values. Refers to "the extent of institutionalized constraints on the decisionmaking powers of chief executives, whether individuals or collectivities," i.e. "the checks and balances between the various parts of the decision-making process": 1- Unlimited Authority, 3- Slight to Moderate Limitation, 5- Substantial Limitations, 7- Executive Parity or Subordination. (Even-numbered scores are "Intermediate" categories.)

Participation Competitiveness: Variable *PARCOMP* (Competitiveness of Participation), from Polity IV project, averaged between 1975-2010, with transition years coded as missing values. Refers to "the extent to which alternative preferences for policy and leadership can be pursued in the political arena": 0- Unregulated, 1- Repressed, 2- Suppressed, 3- Factional, 4- Transitional, 5- Competitive.

Recruitment Openness: Variable *XROPEN* (Openness of Executive Recruitment), from Polity IV project, averaged between 1975-2010, with transition years coded as missing values. Refers to "the extent that all the politically active population has an opportunity, in principle, to attain the position through a regularized process": 0- Lack of regulation, 1- Closed, 2- Dual Executive-Designation, 3- Dual Executive- Election, 3- Open.

Recruitment Competitiveness: Variable *XRCOMP* (Competitiveness of Executive Recruitment), from Polity IV project, averaged between 1975-2010, with transition years coded as missing values. Refers to "extent that prevailing modes of advancement give subordinates equal opportunities to become superordinates": 0 - Lack of regulation, 1- Selection, 2- Dual/Transitional, 3- Election.

GDP per capita in capital city: From Dobbs et al (2011), estimates for 2007. We extract the data from the interactive map available at http://www.mckinsey.com/Insights/MGI/Research/Urbanization/Urban_world.

Military Budget: Average (1990-2006) military expenditure as a share of central government expenditures, from WDI.

Interstate War: Dummy for presence of an instance of interstate war between 1975-2007, from Correlates of War (COW) project.

Individual opinion data (Table 10): Opinion data are from the 2005 AfroBarometer survey (wave 3), available at `http://www.afrobarometer.org`. They come from local-language surveys of random sample of either 1,200 or 2,400 individuals in each country, including 16 sub-Saharan African countries: Benin, Botswana, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Namibia, Nigeria, Senegal, Tanzania, Uganda, Zambia, and Zimbabwe (South Africa is excluded from our analysis). The opinion variables are classified into 4 types, coded from 0 (not at all/never) to 3 (a lot/always). The response on knowledge of the Vice President's name is coded as 1 if the answer is yes, and the respondent gives the correct name.

Additional control variables (Table 10): Control variables in Table 10 are selected in Nunn and Wantchekon's (2011) publicly available data, including: age, age squared, gender, urban, district's ethnic fractionalization, proportion of ethnic group in district, log of total historical slave export per land area, ethnic group average malaria ecology measure, total Catholic and Protestant missions per land area, dummy for historic contact with European explorers, dummy for historical into the colonial railway network, dummy for existence of city among ethnic group in 1400, pre-colonial jurisdictional hierarchies beyond the local community, and categories of the following variables: education level, occupation, religion, living conditions, pre-colonial settlement patterns of ethnicity (included as fixed effects).

Sources for population data (Table 1): *www.saint − petersburg.com/history/*1914 − 1924*.asp*,
http : //en.wikipedia.org/wiki/History_of_MoscowHistorical_demographics,
http : //www.tacitus.nu/historical − atlas/population/russia.htm,
http : //en.wikipedia.org/wiki/AnkaraDemographics,
http : //en.wikipedia.org/wiki/IstanbulDemographics,
http://looklex.com/e.o/turkey.demographics.htm,
http://en.wikipedia.org/wiki/Melbourne_population_growth,
http://en.wikipedia.org/wiki/Demographics_of_AustraliaPopulation_growth_rate,
http://en.wikipedia.org/wiki/NanjingDemographics,
http://en.wikipedia.org/wiki/BeijingDemographics,
http://en.wikipedia.org/wiki/ChinaDemographics,
http://en.wikipedia.org/wiki/Nouakchott,
http://www.google.com/publicdata/explore?ds=d5bncppjof8f9_&met_y=sp_pop_totl&idim=country:MRT
&dl=en&hl=en&q=population+mauritania,
http://en.wikipedia.org/wiki/Rio_de_JaneiroPopulation_growth,
http://www.google.com/publicdata/explore?ds=d5bncppjof8f9_&met_y=sp_pop_totl&idim=country:BRA
&dl=en&hl=en&q=brazil+population,
http://www.kigalicity.gov.rw/spip.php?article4,
http://www.google.com/publicdata/explore?ds=d5bncppjof8f9_&met_y=sp_pop_totl&idim=country:RWA
&dl=en&hl=en&q=rwanda+population,
http://en.wikipedia.org/wiki/Sana'aDemographics,
http://www.google.com/publicdata/explore?ds=d5bncppjof8f9_&met_y=sp_pop_totl&idim=country:YEM
&dl=en&hl=en&q=population+yemen,
http://en.wikipedia.org/wiki/Demographics_of_Karachi,
http://en.wikipedia.org/wiki/Zomba,_Malawi,
http://en.wikipedia.org/wiki/LilongweDemographics,
http://www.google.com/publicdata/explore?ds=d5bncppjof8f9_&met_y=sp_pop_totl&idim=country:MWI
&dl=en&hl=en&q=malawi+population,
http://en.wikipedia.org/wiki/Yamoussoukro,
http : //en.wikipedia.org/wiki/Abidjan,
http : //en.wikipedia.org/wiki/File : Poblaci%C3%B3n_de_Santiago_de_Chile.svg,
http : //en.wikipedia.org/wiki/Demographics_of_Chile,
http : //en.wikipedia.org/wiki/Greater_Valpara%C3%ADso,
http : //www.onlinenigeria.com/links/lagosadv.asp?blurb = 322,
*http : //www.nbs.go.tz/takwimu/references/*2002*popcensus.pdf*(*p.*10),
http : //en.wikipedia.org/wiki/AlmatyDemographics,
*http : //en.wikipedia.org/wiki/AstanaPopulation.*2*FDemographics*,
http : //en.wikipedia.org/wiki/Demographics_of_Kazakhstan,
http : //www.statistics.gov.my/portal/index.php?option = *com_content&view* = *article&id* = 1215&*Itemid* =
89&*lang* = *en*,
*http : //www.britannica.com/EBchecked/topic/*651821*/Yangon*

D Online Appendix: Tables and Figures

Table A.1: Descriptive Statistics: Grid Cell Variables (Averages), Polity≤ 0

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sample	Cells in countries with Polity ≤ 0											
Conflict data	Ongoing conflict indicators						Conflict onset indicators					
Variables	N	Mean	Std. Dev.	Min	Max	Median	N	Mean	Std. Dev.	Min	Max	Median
Latitude	15,569	24.94	16.93	-27.25	55.75	27.75	33,479	34.96	27.11	-54.75	77.25	39.25
Infant mortality rate 2000	15,569	663.9	416.4	49	1,932	546.5	33,479	491.1	410.6	49	2,031	287
Share of mountain 2000	15,569	0.280	0.380	0	1	0.0128	33,479	0.267	0.375	0	1	0.000800
Log time to urban area	15,569	6.141	0.920	3.178	10.31	6.064	33,479	6.339	1.082	2.303	10.31	6.234
Log cell area	15,569	7.871	0.198	1.604	8.039	7.912	33,479	7.642	0.378	1.604	8.039	7.746
Averages over time:												
Log distance to capital	15,569	6.475	0.864	1.386	8.196	6.546	33,479	7.012	1.075	1.386	8.845	7.061
Temperature (°C)	15,569	17.20	9.773	-15.31	31.69	20.74	33,479	8.855	14.09	-23.20	31.52	8.341
Precipitation	15,569	535.6	495.5	72.46	3,944	322.3	33,479	540.9	472.9	69.40	4,716	401.5
Log GCP per capita	15,569	7.683	1.117	5.391	15.75	7.483	33,479	8.390	1.292	5.391	15.75	8.665
Log Population	15,569	9.888	2.211	0	16.18	9.972	33,479	8.633	2.840	0	16.54	8.904
By conflict type:			*Ongoing conflicts*						*Conflict onsets*			
Intrastate Conflict	15,569	0.131	0.237	0	0.950	0	33,479	8.84e-05	0.00174	0	0.109	0
Interstate Conflict	15,569	0.00209	0.0156	0	0.150	0	33,479	1.42e-06	0.000191	0	0.0308	0
Territory Conflict	15,569	0.0315	0.150	0	0.950	0	33,479	4.38e-05	0.00129	0	0.109	0
Gov. Conflict	15,569	0.103	0.196	0	0.950	0	33,479	5.27e-05	0.00126	0	0.0756	0
Intense Conflict	15,569	0.0581	0.141	0	0.850	0	33,479	2.21e-05	0.000761	0	0.0504	0
Less Intense Conflict	15,569	0.0742	0.171	0	0.900	0	33,479	7.23e-05	0.00158	0	0.109	0
Purely Intrastate Conf.	15,569	0.0984	0.203	0	0.950	0	33,479	7.68e-05	0.00162	0	0.109	0
Expanded Intrastate Conf.	15,569	0.0325	0.0844	0	0.500	0	33,479	1.16e-05	0.000535	0	0.0435	0

Table A.2: Descriptive Statistics: Grid Cell Variables (Averages), Polity> 0

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sample	Cells in countries with Polity > 0											
Conflict data	Ongoing conflict indicators						Conflict onset indicators					
Variables	N	Mean	Std. Dev.	Min	Max	Median	N	Mean	Std. Dev.	Min	Max	Median
Latitude	39,913	30.26	34.63	-55.25	77.25	44.25	21,385	19.95	34.02	-55.25	74.75	30.25
Infant mortality rate 2000	39,913	281.8	312.1	30	2,031	194	21,385	208.2	240.8	30	1,650	72
Share of mountain 2000	39,913	0.245	0.361	0	1	0	21,385	0.233	0.353	0	1	0
Log time to urban area	39,913	6.259	1.172	2.079	9.076	6.203	21,385	6.049	1.138	2.079	9.076	5.927
Log cell area	39,913	7.602	0.378	1.899	8.039	7.660	21,385	7.719	0.329	-0.0156	8.039	7.830
Averages over time:												
Log distance to capital	39,913	7.121	1.116	1.386	8.954	7.238	21,385	6.989	1.038	0.693	8.954	7.107
Temperature (°C)	39,913	8.714	13.45	-22.43	35.13	8.002	21,385	13.02	11.35	-22.77	34.48	15.06
Precipitation	39,913	703.6	570.8	74.71	8,987	502.8	21,385	854.1	648.5	78.57	9,379	637.4
Log GCP per capita	39,913	9.225	1.192	5.391	11.31	9.601	21,385	9.503	1.116	5.893	11.31	10.14
Log Population	39,913	7.887	3.252	0	16.65	7.966	21,385	8.077	3.515	0	16.65	8.304
			Ongoing conflicts						*Conflict onsets*			
Intrastate Conflict	39,913	0.0499	0.181	0	1	0	21,385	5.22e-05	0.00123	0	0.0641	0

Table A.3: Descriptive Statistics: Grid Cell Variables (Panel), Polity≤ 0

	(1)	(2)	(3)	(4)	(5)	(7)
Sample	(Cell, year) in countries with Polity ≤ 0					
Variables	N	Mean	Std. Dev.	Min	Max	Median
Precipitation	1,914,640	534.1	483.3	67	6,628	393.8
Temperature (°C)	1,914,640	8.064	14.00	-25.84	38.08	7.175
Log distance to capital	1,914,640	7.046	1.099	1.386	8.845	7.082
Log distance to border	1,914,640	5.661	1.450	0	7.987	5.808
By conflict type:						
Intrastate Conflict	1,914,640	9.35e-05	0.00967	0	1	0
Interstate Conflict	1,914,640	1.57e-06	0.00125	0	1	0
Territory Conflict	1,914,640	5.28e-05	0.00726	0	1	0
Gov. Conflict	1,914,640	5.38e-05	0.00733	0	1	0
Intense Conflict	1,914,640	2.45e-05	0.00495	0	1	0
Less Intense Conflict	1,914,640	7.68e-05	0.00876	0	1	0
Purely Intrastate Conf.	1,914,640	8.25e-05	0.00908	0	1	0
Expanded Intrastate Conf.	1,914,640	1.10e-05	0.00331	0	1	0

Table A.4: Changes in Distance to the Capital and Conflict: Excluding Groups of Countries

	(1)	(2)	(3)	(4)	(5)
		4 groups excluding:			
Sample	Polity ≤0	Former Soviet republics	Former Yugoslav republics	Capital-moving countries	Others
Dependent variable	Conflict *onset*				
Log Distance to Capital	-0.000353**	-0.000561*	-0.000318**	-0.000577***	-0.000345**
	[0.000154]	[0.000333]	[0.000149]	[0.000202]	[0.000162]
Full set controls	Yes	Yes	Yes	Yes	Yes
Cell FEs	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes
Observations	1,914,640	1,069,138	1,908,037	1,622,203	1,124,487
R-squared	0.037	0.038	0.037	0.036	0.035

Robust standard errors in brackets are clustered at country level. Each observation represents a grid cell times year. The dependent variable is the indicator of conflict onsets, averaged from 1946 to 2005 where conflict onset data are available. Column (1) shows the benchmark result in the sample of all countries where time-average polity 2 score is nonpositive. Samples in columns (2) to (5) are detailed in Table 5. Grid cell fixed effects and year fixed effects are included. Control variables include log distance to border, temperature, and precipitation. *** p<0.01, ** p<0.05, * p<0.1.

Table A.5: Isolated Capital Cities and Misgovernance: Additional Robustness

Dependent Variable: WGI PC	(1)	(2)	(3)	(4)	(5)	(6)
	Full Sample		Autocracies		Democracies	
Avg Log Distance	-0.0434	-0.0360	-0.0465	-0.0267	-0.2881***	0.0348
	[0.055]	[0.056]	[0.053]	[0.058]	[0.045]	[0.134]
Avg Log Distance X Autocracy	-0.1898**	-0.2180**	-0.2122**	-0.1957**		
	[0.087]	[0.085]	[0.083]	[0.090]		
Additional Controls	Schooling	Geographical	Density	All		
Full Set of Controls	X	X	X	X	X	X
Observations	113	120	127	109	36	31
R-squared	0.875	0.874	0.871	0.882	0.884	0.930

Robust standard errors in brackets. Z-scores (normalized variables) reported.
WGI PC: First Principal Component of Worldwide Governance Indicators measures (Rule of Law, Voice and Accountability, Government Effectiveness, Regulatory Quality, Control of Corruption, Political Stability).
Schooling: Total years of schooling in 1995; Geographical: island dummy, length of coastline, date of independence, and fuel and ore exports; Density: Population density.
Autocracies: Polity <=0; Established Democracies: Polity > 9.
Basic Control variables: Log GDP per capita, Log Population, Urbanization, and Region and Legal Origin dummies, Majoritarian and Presidential system dummies, and Ethnic Fractionalization. Columns (1)-(4) also include Autocracy dummy as control variable.

Table A.6: Individual Opinions and Distance to Capital Cities

Panel A: Corruption and Politics

	(1)	(2)	(3)	(4)	(5)	(6)
	Perceptions of Corruption				Views on politics:	
Dependent variable	President	Parliament	National Officials	1st Principal Component	People are treated unequally	Careful about what you say
Log Distance to Capital	0.0190**	0.0128**	0.0176***	0.0352***	0.0307***	0.0177**
	[0.00776]	[0.00523]	[0.00495]	[0.00828]	[0.00791]	[0.00689]
Log Distance to Largest Non-Capital City	-0.0357***	-0.0333***	-0.0217**	-0.0617***	0.00463	0.0163
	[0.0108]	[0.00952]	[0.0109]	[0.0174]	[0.0172]	[0.0141]
Full set controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,557	14,893	14,985	13,514	16,688	17,464
R-squared	0.238	0.202	0.181	0.254	0.129	0.183
Region FEs	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Placebo tests

	(1)	(2)	(3)	(4)	(5)	(6)
	Trust				Interest and Information	
Dependent variable	Trust your relatives?	Trust your neighbors?	Intra-ethnic-group trust	Inter-ethnic-group trust	Interest in public affairs	Know VP's name
Log Distance to Capital	0.000936	0.00995	0.00142	0.0157	-0.00858	-0.00078
	[0.0125]	[0.00993]	[0.00694]	[0.0111]	[0.00782]	[0.00228]
Log Distance to Largest Non-Capital City	0.00626	0.00310	0.0172	0.00218	-0.00684	0.0128
	[0.0151]	[0.0188]	[0.0155]	[0.0145]	[0.0147]	[0.00835]
Full set controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,129	17,099	17,052	16,895	18,032	17,115
R-squared	0.194	0.218	0.213	0.178	0.150	0.449
Region FEs	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in brackets are clustered at region level. Dependent variables in Panel A's columns (1) to (3), (5), and (6) are from AfroBarometer 3's questions Q56a, Q56b, Q56d, Q53D, Q53A respectively. Column (4) uses the first principal component of the dependent variables in columns (1) to (3). Dependent variables in Panel B's columns (1) to (8) are from AfroBarometer 3's questions Q84A-D, Q16, Q43C2, Q25, Q41 respectively. See Data descriptions for more details. Control variables include all control variabels used by Nunn and Wantchekon (2011): age, age squared, gender, urban, district's ethnic fractionalization, proportion of ethnic group in district, log of total historical slave export per land area, ethnic group average malaria ecology measure, total Catholic + Protestant missions per land area, dummy for historic contact with European explorers, dummy for historical into the colonial railway network, dummy for existence of city among ethnic group in 1400, pre-colonial jurisdictional hierarchies beyond the local community, and fixed effects for categories of the following variables: education level, occupation, religion, living conditionsm, pre-colonial settement patterns of ethnicity. In addition, region fixed effects are included. *** p<0.01, ** p<0.05, * p<0.1.

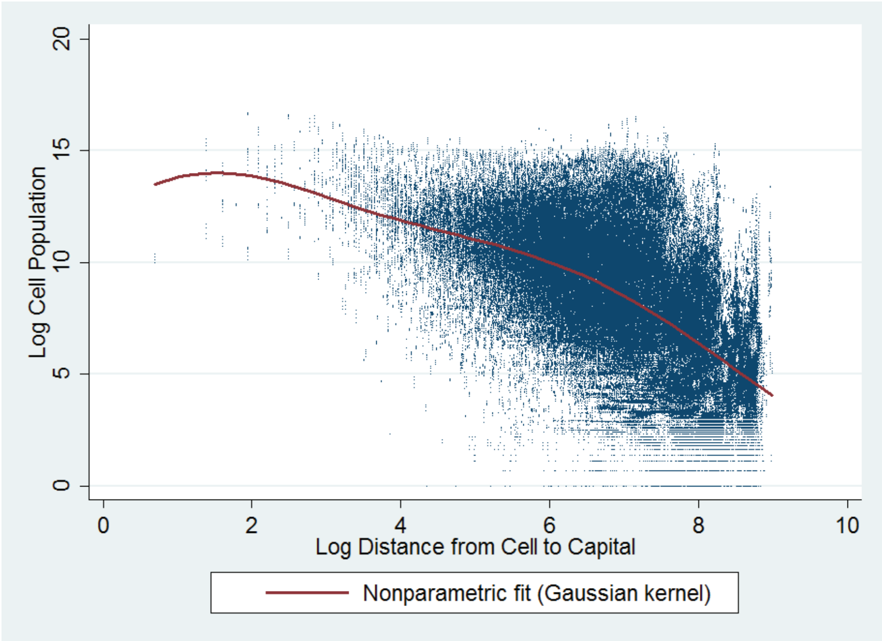


Figure A. 1: Log Cell Population and Log Distance to Capital

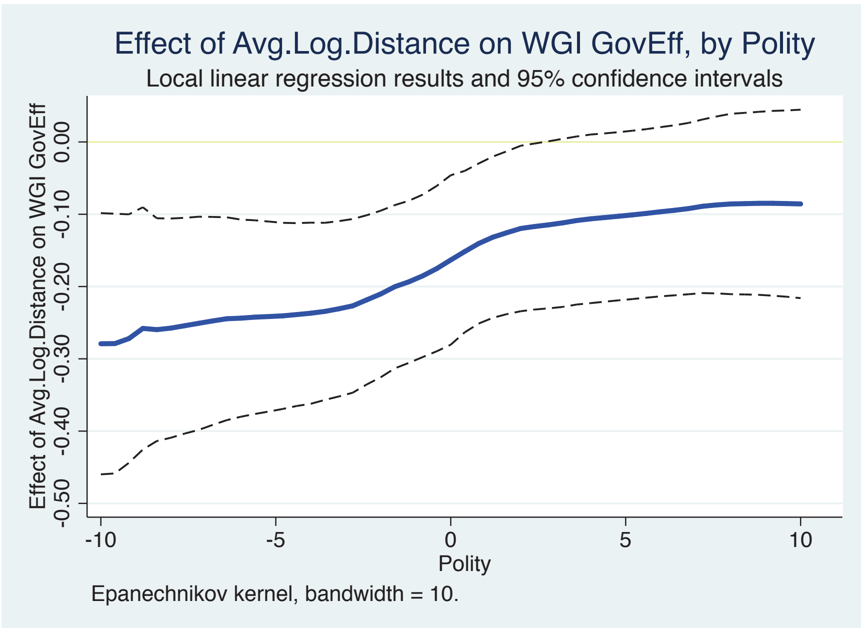
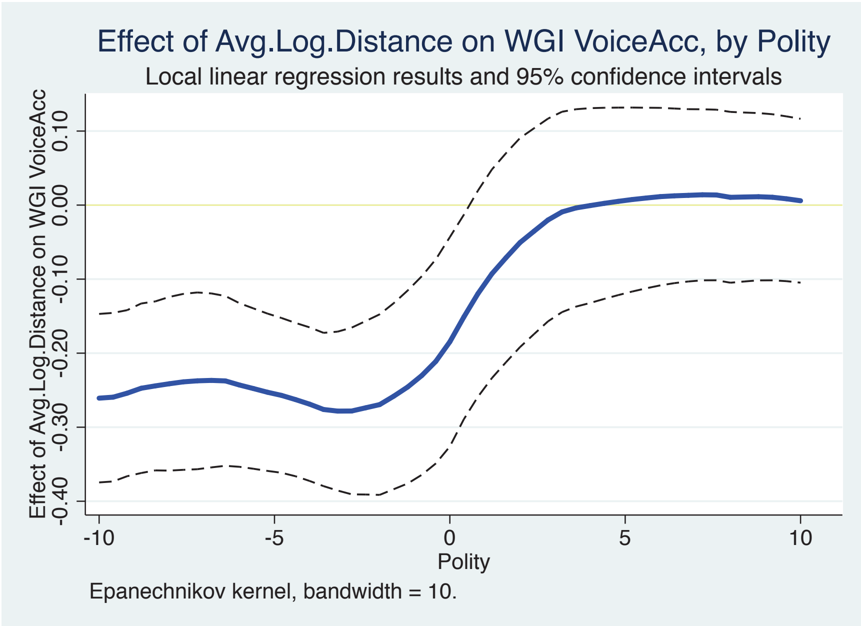


Figure A. 2: Average Log Distance and Government Effectiveness



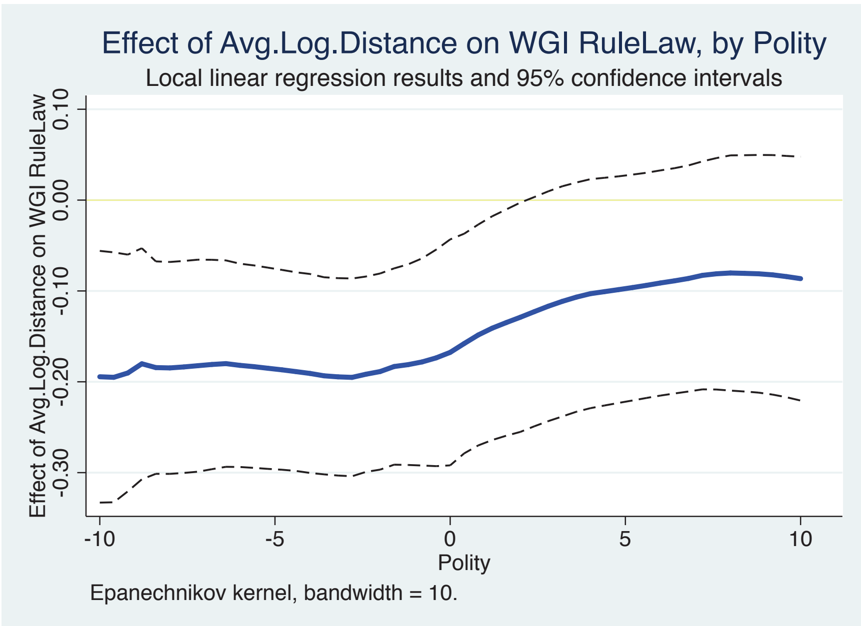
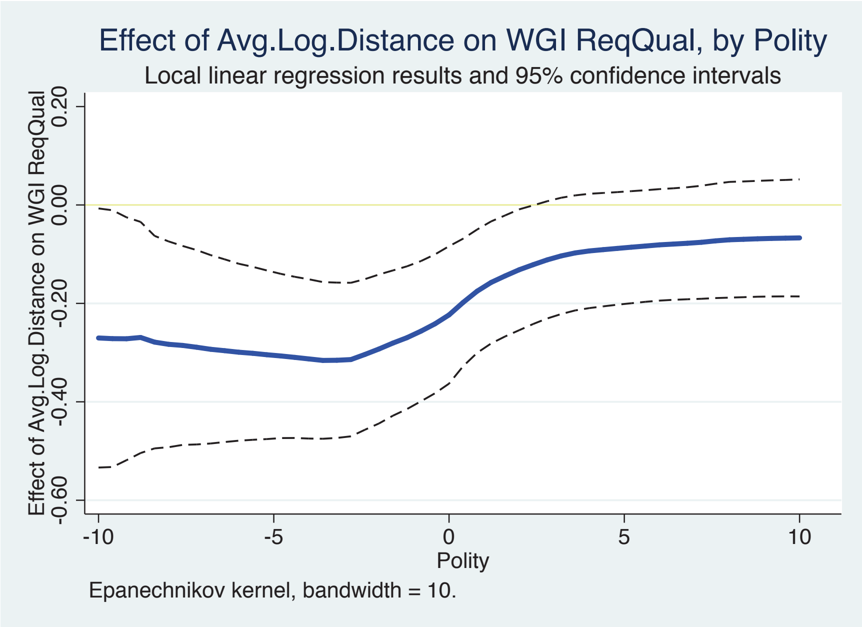


Figure A. 3: Average Log Distance, Voice & Accountability and Rule of Law



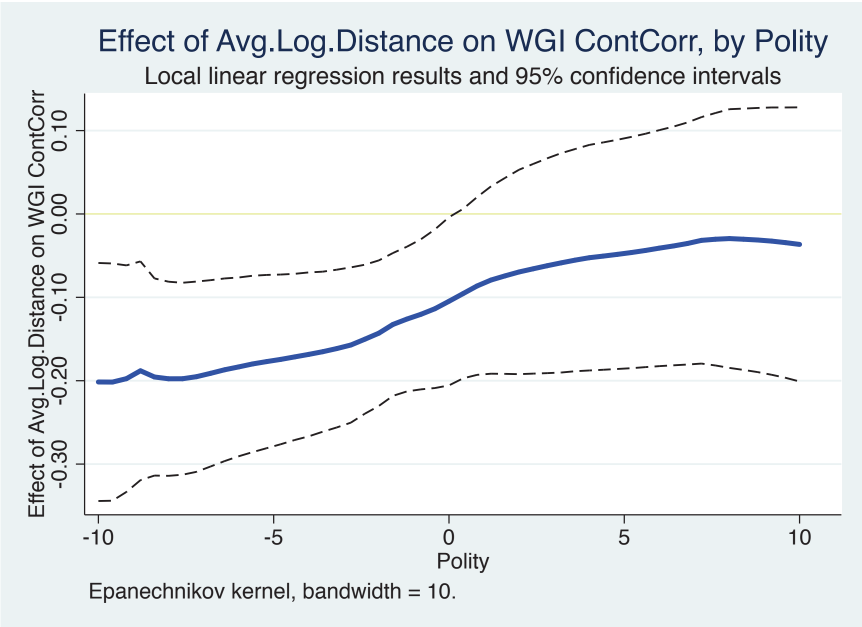


Figure A. 4: Average Log Distance, Government Effectiveness and Control of Corruption

Le LIEPP (Laboratoire interdisciplinaire d'évaluation des politiques publiques) est un laboratoire d'excellence (Labex). Ce projet est distingué par le jury scientifique international désigné par l'Agence nationale de la recherche (ANR). Il est financé dans le cadre des investissements d'avenir.

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