

Isolated Capital Cities and Misgovernance: Theory and Evidence

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Motivation

Understanding Governance:

What constraints governments beyond “formal”
checks and balances?

Understudied Element: Spatial Distribution of Population

- Where you are matters for your political influence
- Spatial proximity to power increases political influence (Ades and Glaeser, 1995)
- Especially so when it comes to the threat of violence / insurrection

Governance x Isolation of the capital

Governance:

World Governance Indicators (1996-2010, avg.)

- Rule of Law
- Government Effectiveness
- Control of Corruption
- Voice and Accountability
- Regulatory Quality
- Political Stability

Governance x Isolation of the capital

Isolation of the capital city:

Average log distance of population to the capital
(Campante and Do 2010)

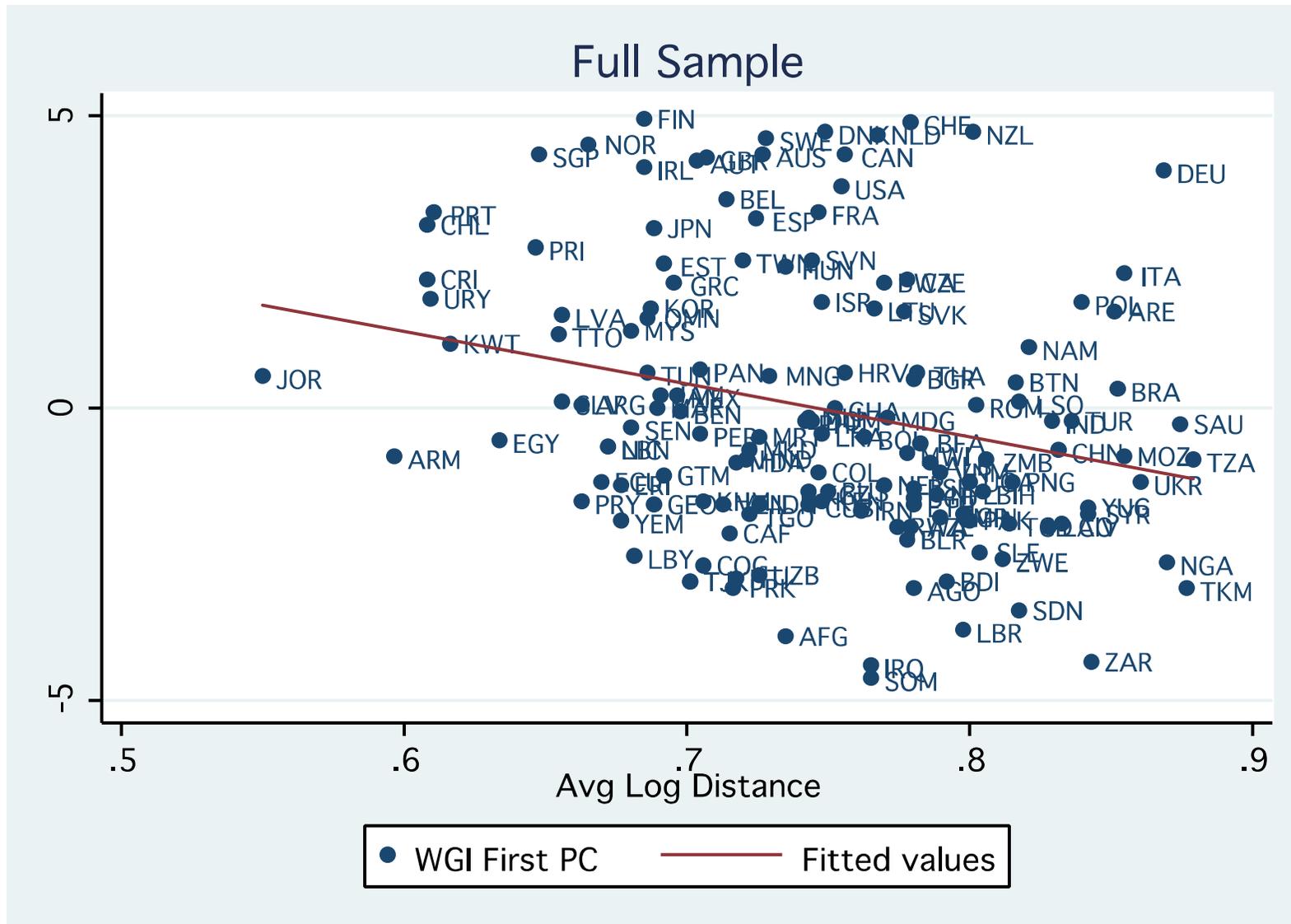
Measure satisfies

- Subgroup consistency
- Rank invariance
- Strict monotonicity
- robust to measurement approximations
- movements closer to the capital are more important

Our measure:

- We adopt the version normalizing by country size
- Data from *Gridded Population of the World* (1990), 5-km cells

Stylized Fact



Stylized fact:

Isolated Capital Cities are associated with worse governance.

Road map:

- Facts and motivation
- Theory about how the isolation of the capital city and governance interact under the threat of insurrections
- Empirical test of the predictions generated by the theory

Related Literature

- Political Implications of Spatial Distributions
 - Campante & Do (2012)
 - Isolated Capitals and Corruption across US states
- Endogenous Institutions & (Threat of) Political Violence
 - Guimaraes & Sheedy (2012)
 - Commitment requires sharing power

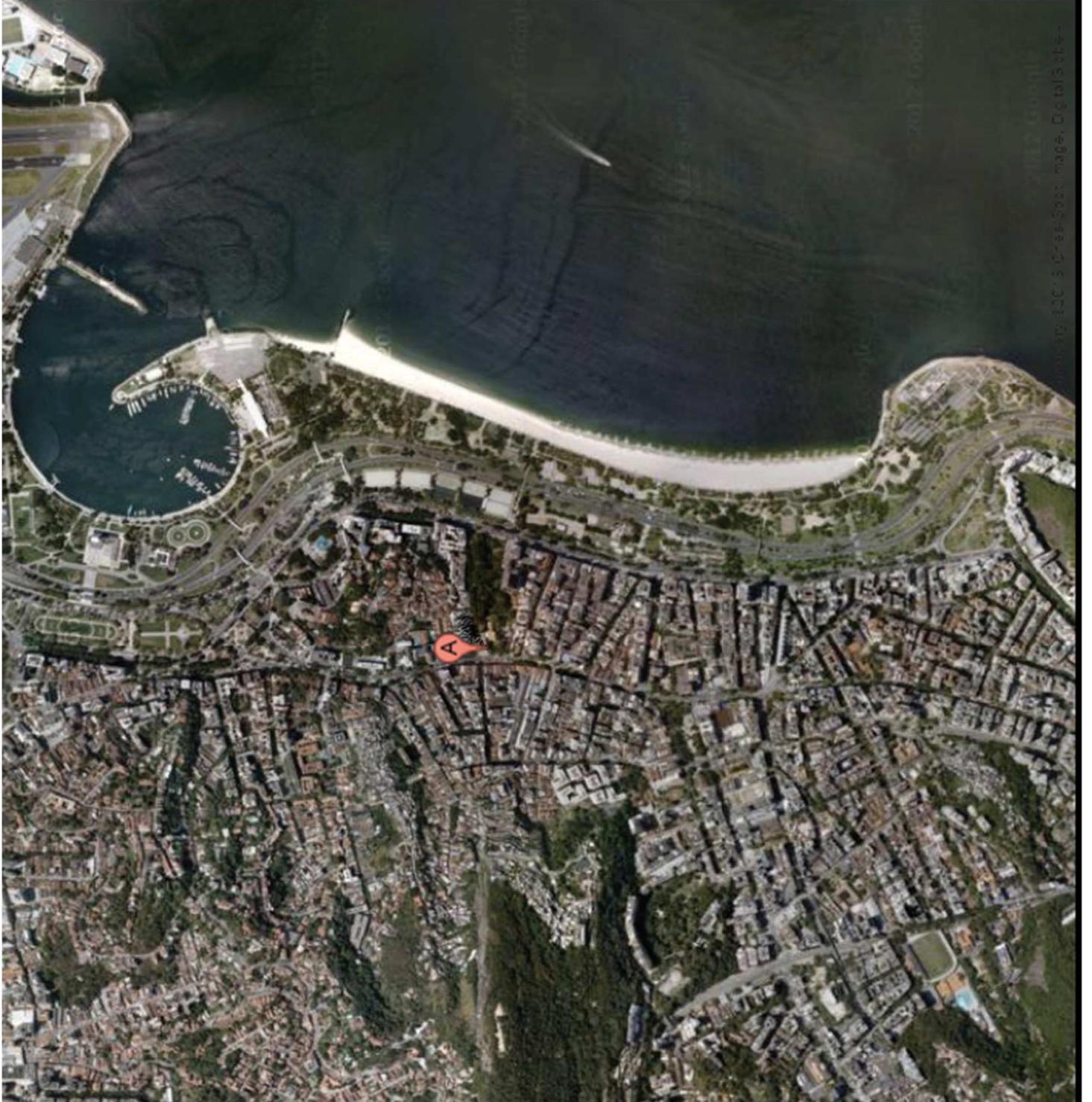
Motivation

Revolutions and Capital Cities

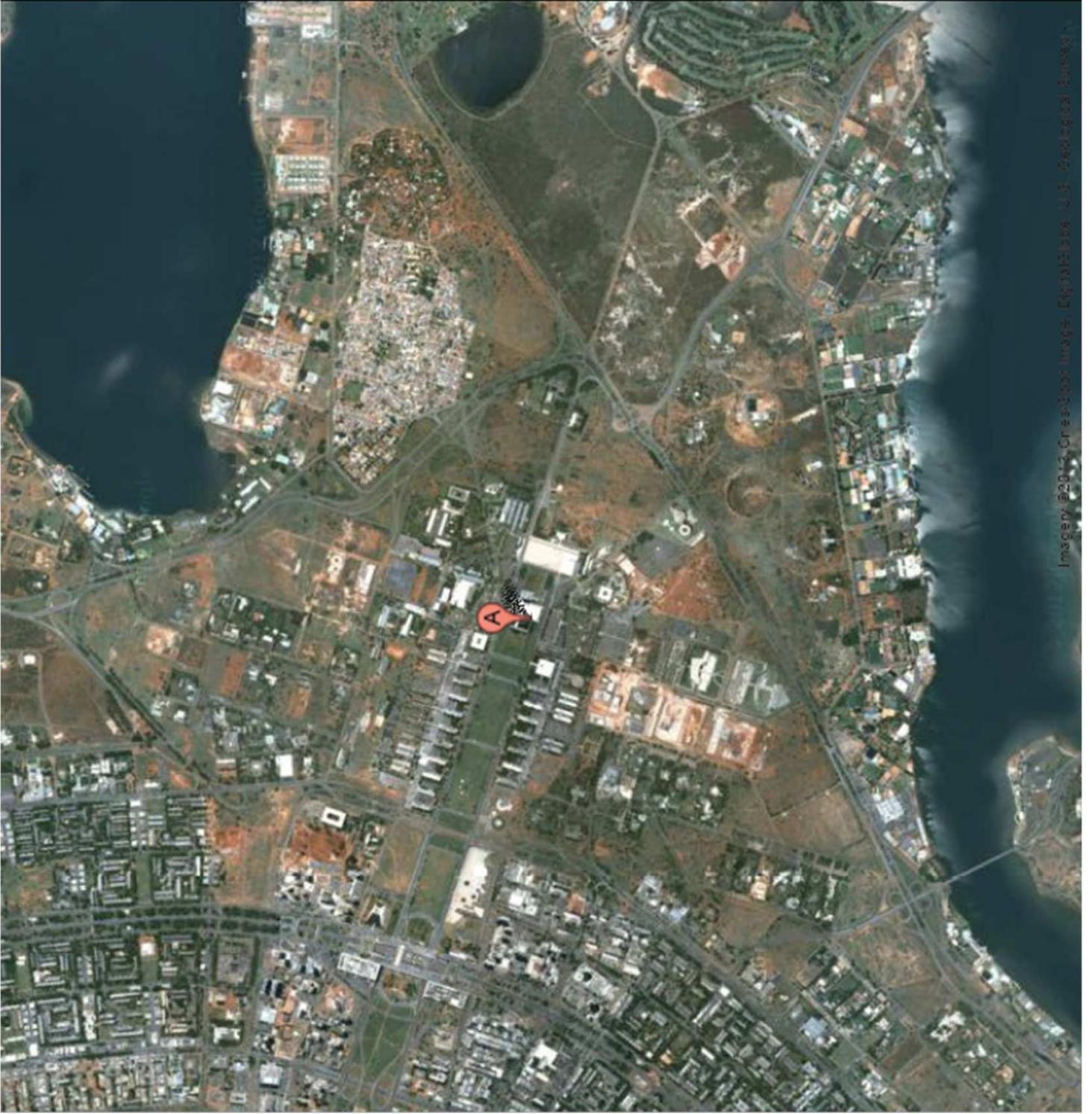
- As the capital goes, so goes the country...
- Historical example: 18th-19th century France
- Contemporaneous examples: Ukraine, Thailand

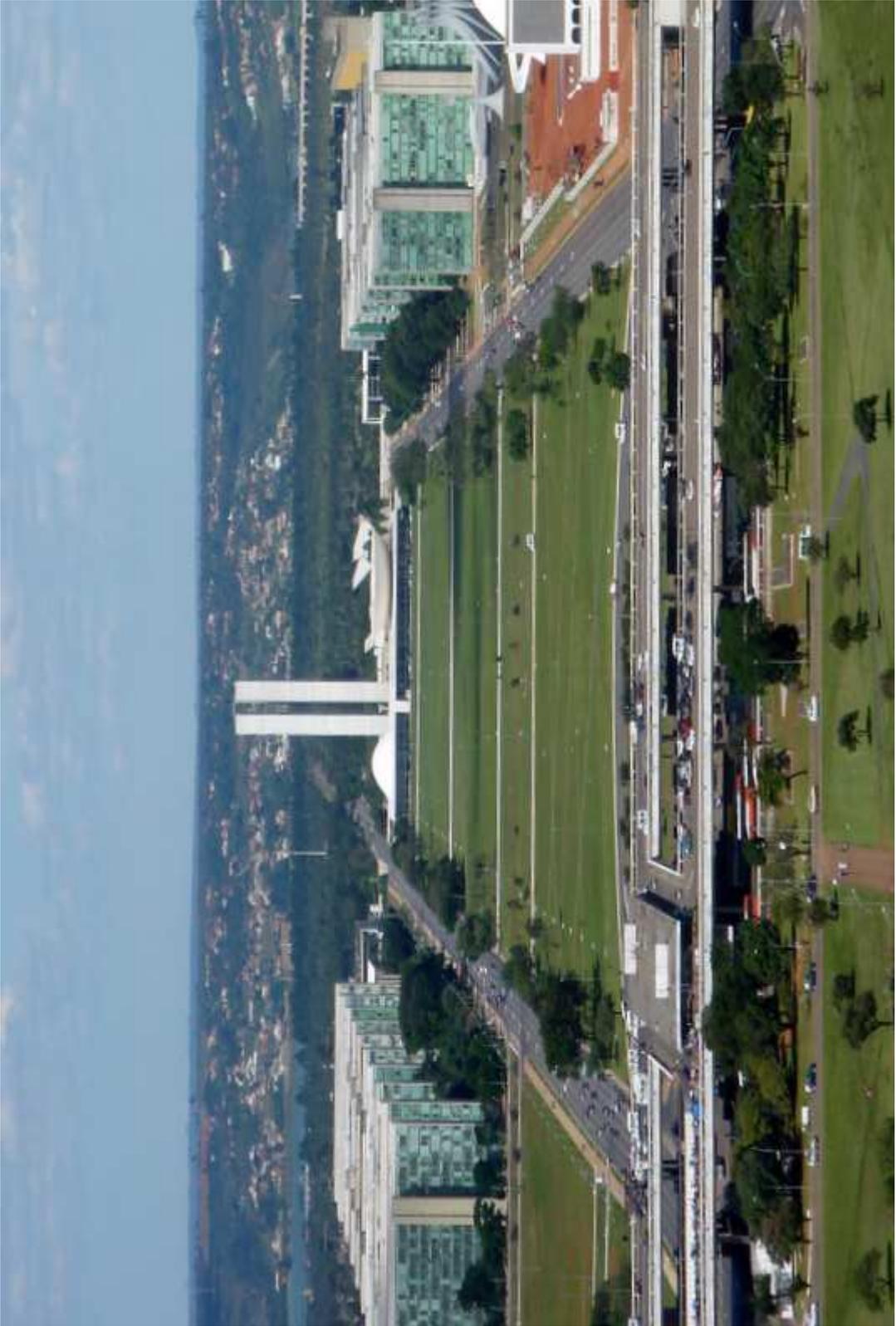
Guess who have figured that out? Incumbents!

- Many examples of proposed and undertaken relocations
 - Versailles, Brasilia, Naypyidaw



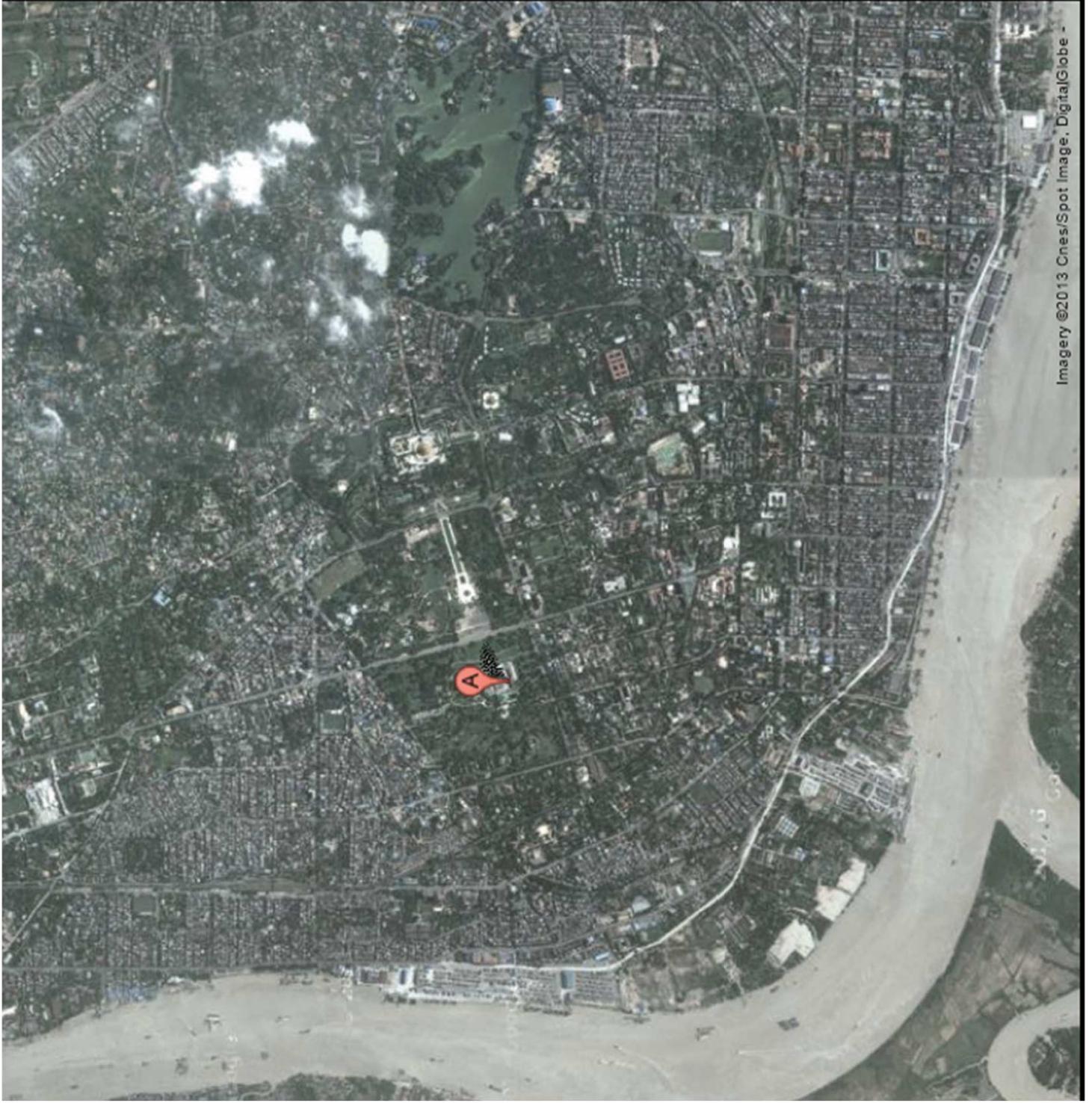






“Vast and empty, Burma’s new capital will not fall to an urban upheaval easily. It has no city centre, no confined public space where even a crowd of several thousand people could make a visual – let alone political – impression. Naypyitaw, then, is the ultimate insurance against regime change, a masterpiece of urban planning designed to defeat any putative colour revolution – not by tanks and water cannons, but by geometry and cartography. 320 kilometres to the south, Rangoon, with five million people, is home to one-tenth the country’s population. But even if that city were brought to a standstill by public protests and demonstrations, Burma’s military government – situated happily in the middle of paddy fields in the middle of nowhere – would remain unaffected.”

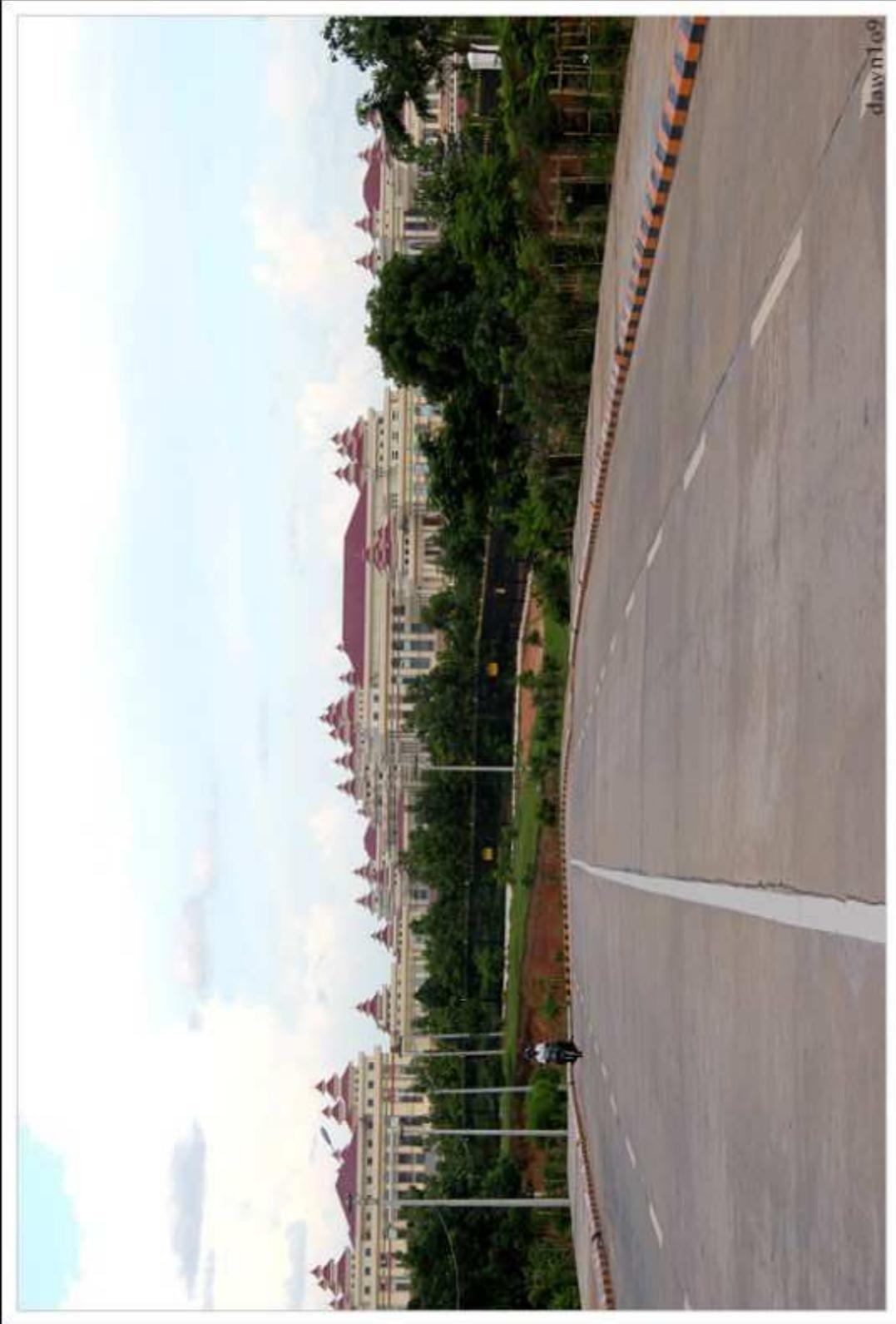
Varadarajan, S., 2007, “Dictatorship by Cartography, Geometry”



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Golf



dawn109

Motivation

Revolutions and Capital Cities

- As the capital goes, so goes the country...
- Historical example: 18th-19th century France
- Contemporaneous examples: Ukraine, Thailand

Guess who have figured that out? Incumbents!

- Many examples of proposed and undertaken relocations
 - Versailles, Brasilia, Naypyidaw
- In general, protection is an (explicit or disguised) goal
- Policies discouraging migration to cities are also common
 - Vietnam, China, Cambodia (under the Khmer Rouge)

Table 1. 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 metropolitan 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.

Model

We want a model to understand:

- the relationship between ***governance*** and ***isolation of the capital city***
- In the context of ***institutional choice*** by an ***incumbent elite***
- that can ***extract rents*** from its citizens but is constrained by the ***threat of insurrection***

Key assumption: those who are closer to the capital present a greater threat

Individuals

- Ex ante identical individuals
- Ex post individuals will be either:
 - Members of the incumbent army (measure \mathbf{a})
 - Civil authorities (if they exist, measure ξ)
 - Citizens in the capital city
 - Citizens in a “faraway” place
- Utility function:

$$u = \log(C) - F$$

where \mathbf{F} is fighting effort

elite
(measure \mathbf{p})

only 2 possible places

Technology

- Optimal fraction of workers in the faraway place: ℓ^*
- Aggregate production function:

$$Y = A(y^* - \phi(\Delta\ell))$$

- y^* : level of production if measure of workers in the faraway place (ℓ) is ℓ^*
- $\Delta\ell: \ell - \ell^*$
- $\phi(0) = 0, \phi'(0) = 0, \phi'' > 0$

Technology

$$Y = A(y^* - \phi(\Delta\ell))$$

- $A = 1$ if *home technology* is used
- $A = \beta$ if *market technology* is used
- Output produced with market technology can be expropriated if there are no civil authorities
 - Civil authorities provide checks and balances (assumption)
 - Market technology relies on institutions that protect property rights and enforce contracts
 - It requires a larger \mathbf{p}

The incumbent army chooses:

- ***Governance***
 - Will there be civil authorities providing checks and balances?
Good governance ($s = G$) vs Bad governance ($s = B$)
 - Constraint: all members of the elite have to get the same payoff
→ sharing power requires sharing rents
- ***Location of each citizen***
 - At the capital city or at “faraway”.
 - Meant to capture all policies that affect the distribution of population relative to the capital (e.g., location of the capital)
- ***Allocation of resources***
 - Transfers might be individual-specific
 - No exogenous restrictions on how citizens can be taxed

Institutional Context

We will consider two different contexts:

- ***Democracy***: Incumbents maximize average utility of citizens
 - Think of a probabilistic voting model
 - Incumbent army cannot “tear the Constitution” and set up an autocratic government
- ***Autocracy***: Incumbents maximize their own welfare
 - Rebellions constrain their choices

We do not model transitions between the two contexts, and democratic institutions are assumed.

Sequence of events

1. Incumbent army (random set, measure a) choose governance, location of citizens and transfers
2. There are opportunities for rebellions. In case of a successful rebellion, the rebel army takes power and we are back to (1).
3. Production takes place, either using home technology or market technology
 - In case of bad governance, agents that used market technology have their output stolen
4. Taxes are implemented, payoffs are received

Rebellions

- A Rebel army is a subset (measure a) of set of citizens.
- A rebellion is successful if:

$$\int_{\mathcal{R}} S(z) dz > \delta a$$

where

$$S(z) = \begin{cases} F(z) & \text{if } z \in \mathcal{C} \\ F(z) - T & \text{if } z \in \mathcal{F} \end{cases}$$

Crucial
assumption



and

$$F(z) = u_p^e - u(z).$$

- In equilibrium, there must be no successful rebellion.

Markovian Equilibrium

- Fighting effort depends on utility of the following incumbent army if the rebels take power
 - That depends on constraints they will face (rebellion threats), which depends on utility of further incumbent armies...
 - At each stage of this (off equilibrium path) process, elites are solving a maximization problem of the same form.
- We focus on Markovian equilibria: decisions depend only on current payoff-relevant variables
 - All elites at this (off equilibrium path) process make the same choices.

Case of Democracy

- Problem of the elite is simply to maximize output
- Optimal output is chosen (\mathbf{y}^*)
- Isolation of the capital city is pinned down by \mathbf{y}^* ...
- ... which is unrelated to the choice of governance

- Governance and isolation of capital city are ***uncorrelated***

Case of Autocracy

- Incumbents choose consumption of every worker, isolation of the capital and governance.
- They have to respect the budget constraint and the no-rebellion constraint.

$$\max_{C_w(\cdot), \Delta \ell, s} C_p$$

$$\text{s.t. } \int_{\mathcal{P}} C_p dz + \int_{\mathcal{W}} C_w(z) dz = Y,$$

$$\text{and } \int_{\mathcal{R}} S(z) dz \leq \delta a \text{ for all } \mathcal{R} \subset \mathcal{W} \text{ such that } P(\mathcal{R}) = a$$

Payoff equalization

- Payoffs of citizens at each location are equalized
- Citizens at the capital receive a larger payoff for having a lower cost of rebellion

$$C_{w,C} = C'_p e^{-\delta} \quad C_{w,F} = C'_p e^{-\delta-T}$$

- Intuition:
 - In equilibrium, a binding rebel army comprises individuals with the largest fighting strength
 - It is optimal to equalize fighting strength across citizens
 - That means keeping those with the same power equally disgruntled and exploiting the weaker ones

Maximization problem

- Payoff equalization and the budget constraint yield:

$$C_p = \frac{1}{p} \left(A(y^* - \phi(\Delta \ell)) - (1-p)(1 - [\ell^* + \Delta \ell])C'_p e^{-\delta} - (1-p)[\ell^* + \Delta \ell]C'_p e^{-\delta-T} \right)$$

- Incumbents take $\varepsilon C'_p$ even when making choices
- In equilibrium, $C'_p = C_p$

Isolation of the capital

Proposition 2 *Comparative statics for the choice of $\Delta\ell$:*

(i) For a given s , $\Delta\ell$ is increasing in T ;

(ii) For a given s , $\Delta\ell$ is increasing in ℓ^ ;*

(iii) For given parameters, $\Delta\ell$ is smaller when $s = G$.

- Good governance leads the elite to choose a less isolated capital.
- Good governance \rightarrow rents are less concentrated \rightarrow smaller benefit of extra protection for the elite

Governance

For given parameters:

- Good governance is chosen if \mathbf{T} is below a threshold
- Good governance is chosen if τ^* is below a threshold

The proof shows that:

- Larger \mathbf{T} (or τ^*) benefits the elite but especially so in case of bad governance

Intuition:

- Isolated capital: elite grabs a larger share of output
- Sharing rents is thus more costly for the elite

Capital city premium

- Capital City Premium depends positively on T
 - Payoff ratio: e^T
 - Those in faraway places are more exploited
 - Capital city premium is unaffected by τ^*
- Isolation of the capital depends positively on T
 - So they are positively correlated

Military spending

- Suppose the elite can spend in “guns” (g) to improve their chances in conflict: δ is increasing and concave in g
- Result: Military spending (g) is decreasing in τ^* and T
- Intuition: Military spending and capital isolation are substitutes
- If the capital is isolated, citizens are poorer, returns to increase power to exploit are smaller.

Empirical Evidence

Can the model account for the motivating stylized fact?

- Specific context: no relationship in democracies
- Which aspects of governance?
- Specific mechanism: power sharing
- Correlation with capital city premium
- Correlation with military spending

Basic Result

Table 2. Isolated Capital Cities and Misgovernance

	(1)	(2)
<hr/>		
Dep. Var.: WGI PC		
	Full Sample	
Avg Log Distance	-0.1513***	-0.1335**
	[0.054]	[0.050]
Avg Log Distance X Autocracy		
Basic Set of Controls	X	
Full Set of Controls		X
Observations	127	127
R-squared	0.830	0.838

Robust standard errors in brackets. Z-scores (normalized variables) reported.

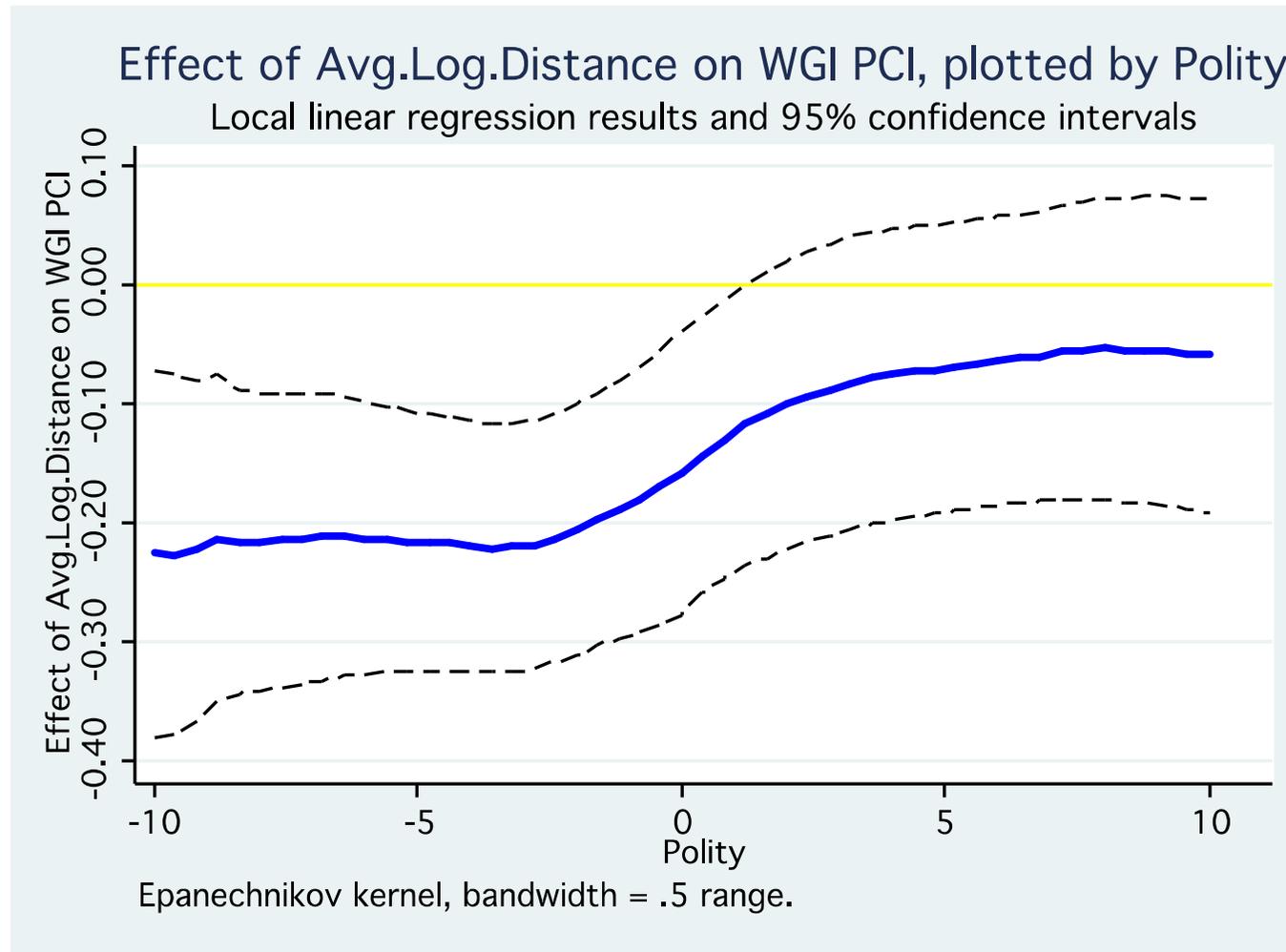
WGI PC: First Principal Component of Worldwide Governance Indicators measures (Rule of Law, Voice and Accountability, Government Effectiveness, Regulatory Quality, Control of Corruption, Political Stability).

Autocracies: Bottom tercile of Polity (≤ 0.4); Established Democracies: Polity > 9 .

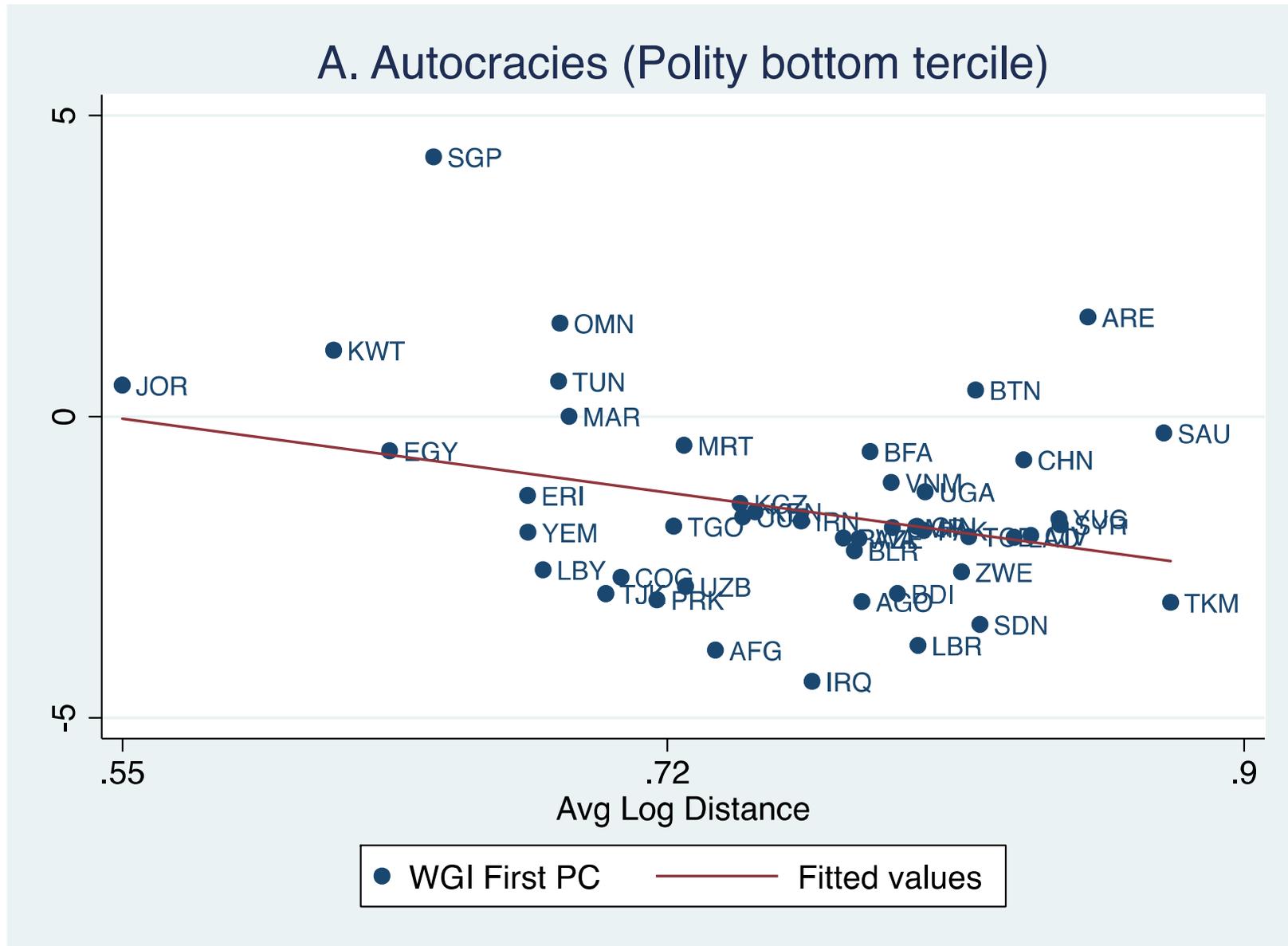
Basic Control variables: Log GDP per capita, Log Population, Urbanization, and Region and Legal Origin dummies. Full Set of Controls adds Majoritarian and Presidential system dummies, and Ethnic Fractionalization. Columns (7)-(8) also include Autocracy dummy as control variable.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Democracies vs Non-Democracies

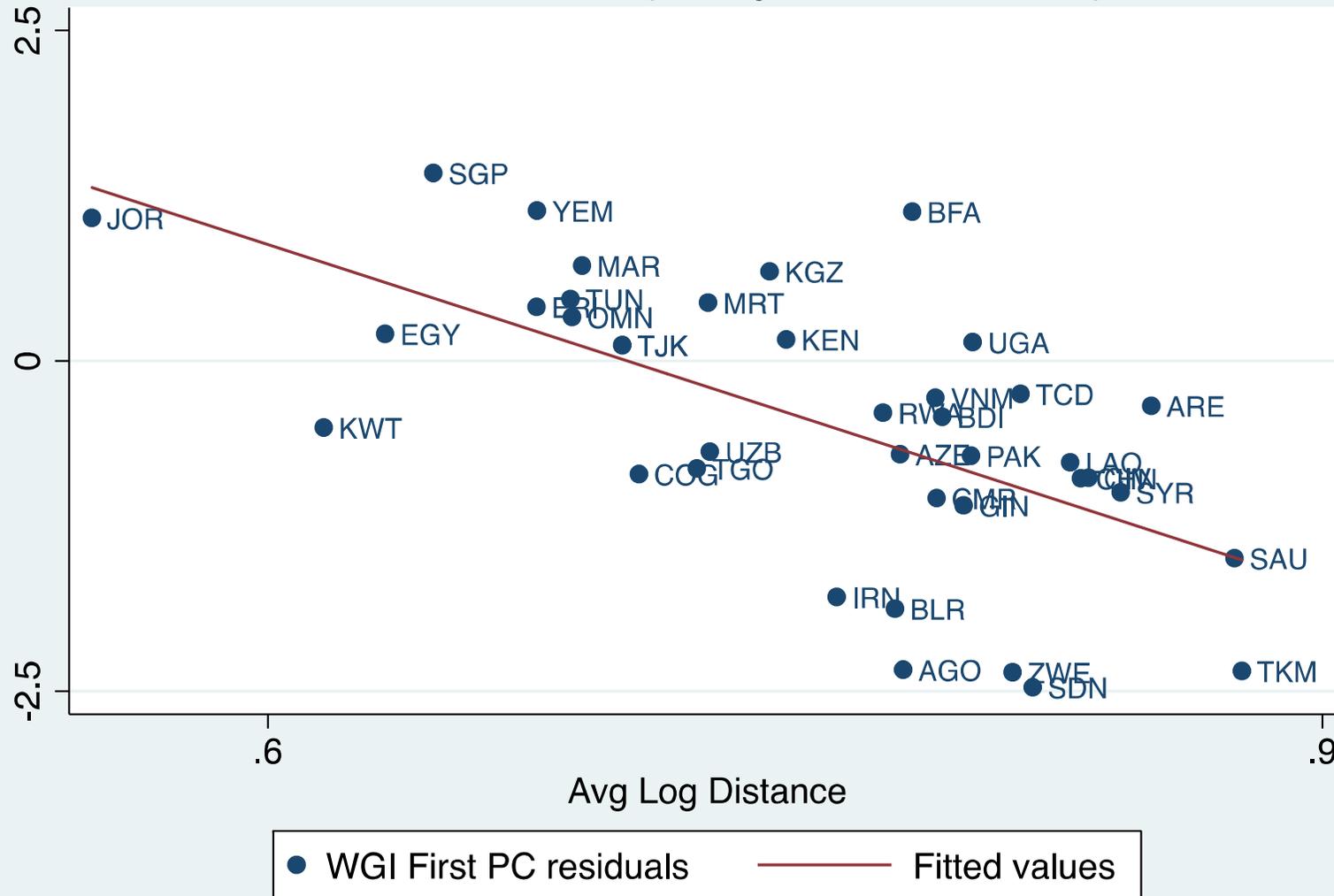


Democracies vs Non-Democracies

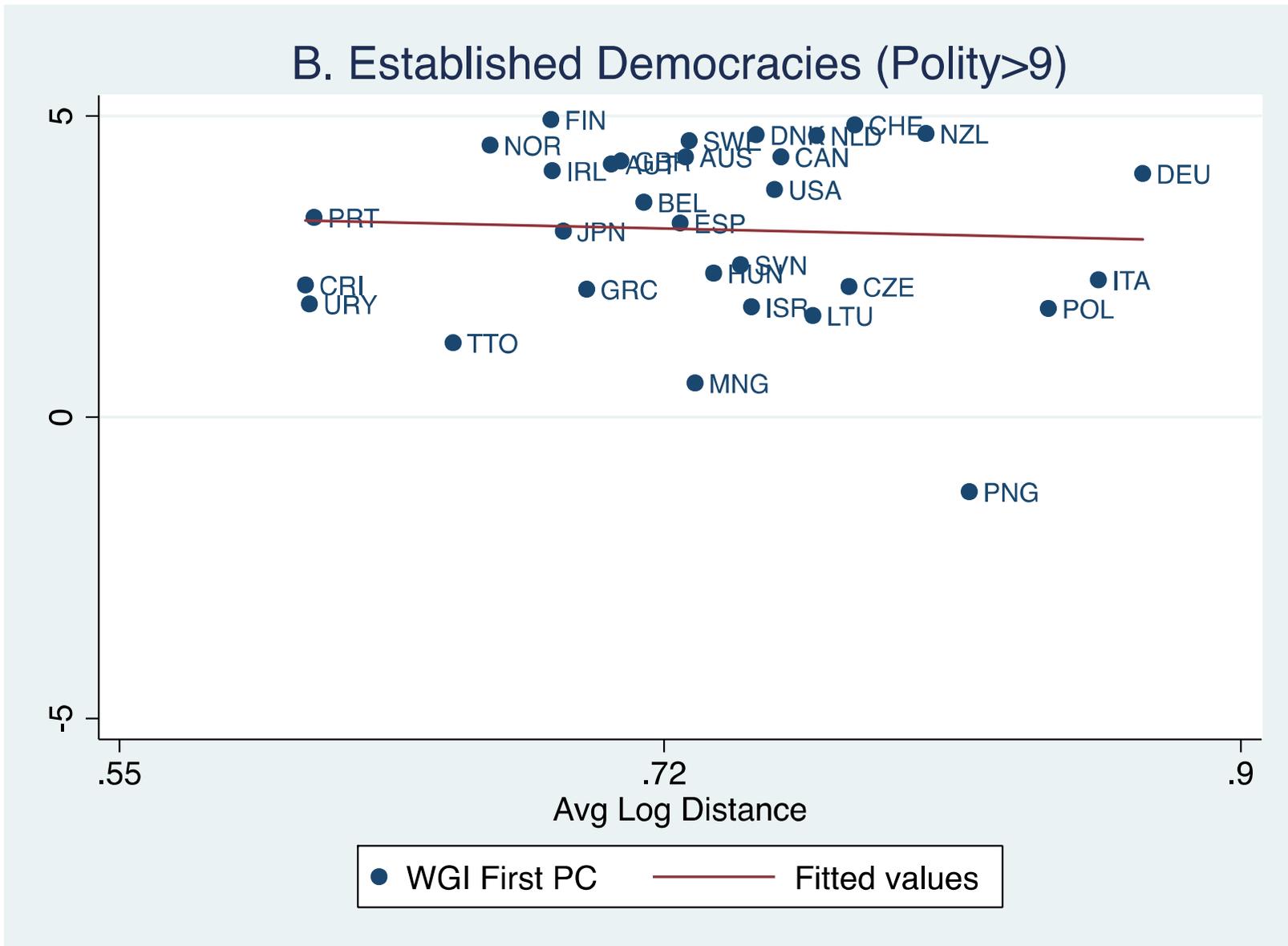


Democracies vs Non-Democracies

A. Autocracies (Polity bottom tercile)



Democracies vs Non-Democracies



Democracies vs Non-Democracies

Table 2. Isolated Capital Cities and Misgovernance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.: WGI PC								
	Full Sample		Autocracies		Establ. Democracies		Full Sample	
Avg Log Distance	-0.1513***	-0.1335**	-0.2605***	-0.3056***	-0.0646	-0.0249	-0.0500	-0.0504
	[0.054]	[0.050]	[0.069]	[0.058]	[0.121]	[0.133]	[0.061]	[0.061]
Avg Log Distance X Autocracy							-0.2335***	-0.2380***
							[0.081]	[0.082]
Basic Set of Controls	X		X		X		X	
Full Set of Controls		X		X		X		X
Observations	127	127	36	36	31	31	127	127
R-squared	0.830	0.838	0.848	0.883	0.881	0.896	0.873	0.874

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: Bottom tercile of Polity (≤ 0.4); Established Democracies: Polity > 9 .

Basic Control variables: 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.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Quantitatively: going from Nairobi (average isolation) to Khartoum (one s.d. above) explains about 40% of the difference in governance between Kenya (average governance among autocracies) and Sudan (one of the worst in the world)

Robustness

Table 3. Isolated Capital Cities and Misgovernance: Robustness

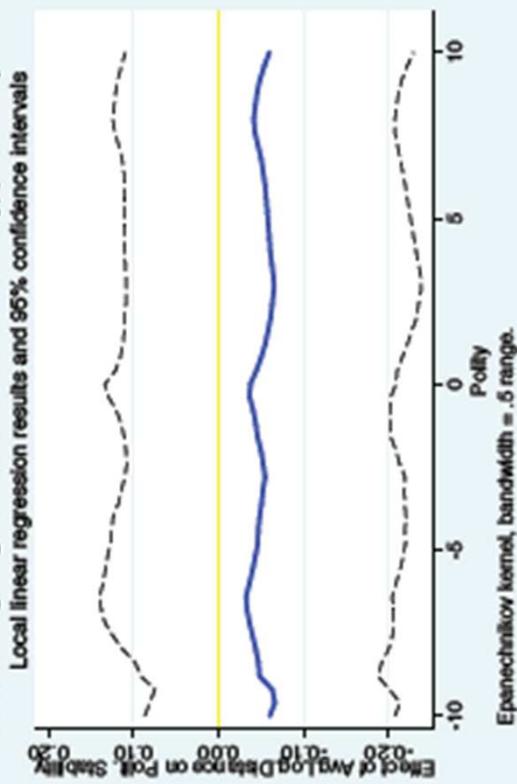
Dep. Var.:	(1) WGI PC	(2) WGI PC	(3) WGI PC	(4) WGI PC	(5) WGI PC	(6) WGI PC	(7) FH	(8) FH	(9)
	Autocracies	Democracies	Autocracies	Democracies	Autocracies	Democracies	Autocracies	Democracies	Full Sample
Avg Log Distance (unadj.)	-0.4358*** [0.128]	0.0667 [0.317]							
Distance Min. Isolation			-0.2145*** [0.071]	0.0220 [0.082]					
Capital Primacy					0.1323* [0.071]	-0.2012** [0.090]			
Avg Log Distance							-0.2009** [0.080]	0.0066 [0.025]	0.0030 [0.065]
Avg Log Distance X Autocracy									-0.2728*** [0.094]
Avg Log Distance (Other Largest)									-0.1471* [0.075]
Avg Log Distance (Other Largest) X Autocracy									0.0750 [0.116]
Observations	36	31	36	31	32	31	35	29	126
R-squared	0.855	0.898	0.852	0.896	0.863	0.915	0.611	0.891	0.881

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: Bottom tercile of Polity (≤ 0.4), except for Column (5) where the threshold is the median (≤ 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, for Columns (1)-(2) only; and Maximum Distance in the Country (Log of maximum distance (in km) between capital city and any point in the country), for Columns (3)-(4) only. Column (9) also includes Autocracy dummy as control variable.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

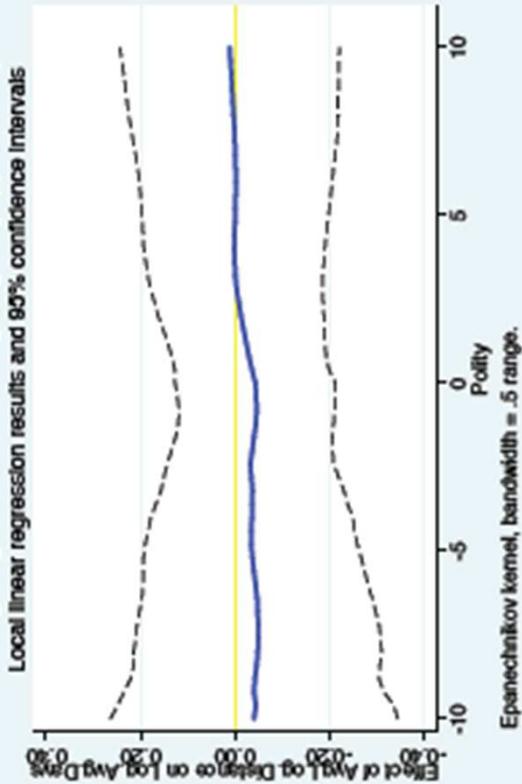
Panel A

Effect of Avg.Log.Distance on Polit. Stability, plotted by Polity



Panel B

Effect of Avg.Log.Distance on Log.Avg.Days, plotted by Polity



Power Sharing

Data: “Polity” score components (Polity IV), avg. 1975-2010

- Related to power sharing:
 - “**independence of executive authority**” (ExecutiveConstraints): “the extent of institutionalized constraints on the decision making powers of chief executives”, ranging from “unlimited authority” to “executive parity or subordination”
 - “**political competition and opposition**” (ParticipationCompetitiveness): “the extent to which alternative preferences for policy and leadership can be pursued in the political arena”, ranging from “repressed” to “competitive”
- Not so related:
 - “**executive recruitment**” (RecruitmentCompetitiveness and RecruitmentOpenness): whether there is access to executive positions through a regularized process.
 - Ex.: USSR had perfect score in *Openness*, simply because succession was not hereditary.

Power Sharing

**Table 5. Isolated Capital Cities and Power Sharing in Autocracies
(Polity below Median)**

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]
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: Below median Polity(≤ 6).

Control variables: Log GDP per capita, Log Population, Urbanization, Region and Legal Origin dummies, Majoritarian and Presidential system dummies, and Ethnic Fractionalization.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Power Sharing

Table 4. 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
<i>Average</i>				-0.50	-0.79
<i>p-value</i>				0.266	0.021

Excluding partial changes. For sources and notes, see Table 1. 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.

Additional Predictions

Table 6. Isolated Capital Cities, Capital Premium, and Military Expenditures

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
	Capital Premium	Capital Premium	Capital Premium	Military Budget	Military Budget	Military Budget
	Autocracies	Democracies	Full Sample	Autocracies	Democracies	Full Sample
Avg Log Distance	0.4158*** [0.141]	-0.1040 [0.209]	-0.0287 [0.148]	-0.3393*** [0.124]	-0.0150 [0.133]	0.0986 [0.116]
Avg Log Distance X Autocracy			0.4096** [0.197]			-0.3912** [0.169]
Interstate War				0.4441* [0.247]	0.6072** [0.235]	0.5975*** [0.192]
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: 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: dummy for involvement in interstate war between 1975 and 2007 (Correlates of War).

Autocracies: Polity (1975-2000) below median (≤ 3.1); Democracies: Polity (1975-2000) above median (> 3.1). Control variables: Log GDP per capita, Log Population, Urbanization, Majoritarian and Presidential system dummies, and Ethnic Fractionalization.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In Sum

- Isolated capitals are associated with misgovernance
 - Result does not hold in democracies.
- A model where those in power choose governance, location of citizens and taxes subject to the threat of rebellion is consistent with the evidence
- Spatial distribution is relevant for understanding institutions and governance