Erosion of State Power, Corruption Control, and Fiscal Capacity*

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Abstract

We model how corruption erodes state power, i.e., the state's ability to keep its apparatus under control in crises. Under a general assumption about fat-tailed risk of crisis, we show that given strong fiscal capacity, the head of the state will control local corruption at such a level that its power is secured; given weaker capacity, the state will over-tolerate corruption to retain officials, risking control in crises; moreover, a state may be trapped with too weak fiscal capacity, rampant corruption, and the state losing control in any real crisis, while having little incentive to invest in fiscal capacity. By developing historical narratives, we show that these theoretical results are consistent with experience from the Roman Empire, New Kingdom of Egypt, Ming China and many other powerful states in history.

Keywords: corruption; state apparatus; state authority; crisis.

JEL codes: D73; H12; N40.

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1 Introduction

Corruption is an important and pervasive phenomenon that gets much attention in political and economic research (Shleifer and Vishny, 1993, p. 599; Kreike and Jordan, 2004). Economic analysis emphasizes mostly the efficiency implications of corruption.[1] Political scientists have investigated how corruption affects the functioning of the political system and how it damages people's support for corrupt regimes.[2] Relatively little formal analysis has been devoted to how corruption erodes the power, authority, or control of the chain of command within the state apparatus.[3]

The literature on state capacity has, on the other hand, created interest in understanding better the functioning of the state apparatus.[4] It has focused on the capacity of the state to extract revenue and support markets, and on the incentives to invest in such capacity. Little attention has been paid to how corruption may lead to decay, and even collapse of state authority, and how this process can depend on the other dimensions of state capacity.

At the intersection of these two lines of research, we attempt in this paper to investigate three interconnected questions. First, how does corruption erode state power? Second, how can this erosion shape the control of local corruption by the head of the state apparatus? Finally, how can this mechanism be influenced by fiscal capacity, one of the most important economic dimensions of state capacity?

We build an applied-theoretical model where the head of the state, i.e., the Center, is endowed with a certain level of fiscal capacity to maintain the state apparatus on a daily basis, i.e., to retain a local official, who represents the lower-level members of the apparatus.

[1]For corruption's effects in "greasing the wheels" of the economy but more often in distorting resource allocation, preventing creative destruction, and increasing agency costs, see, for example, Leff (1964), Tullock (1967), Krueger (1974), Rose-Ackerman (1978), Lui (1985), Laffont and Tirole (1991), Shleifer and Vishny (1993), Mauro (1995), Acemoğlu and Verdier (1998, 2000), Tanzi and Davoodi (1998), Guriev (2004), Méndez and Sepúlveda (2006), Olken (2006), Bertrand et al. (2007), Fisman and Svensson (2007), Cai et al. (2011), Aghion et al. (2016), Colonnelli and Prem (2017), and Allen et al. (2018). See also surveys by Bardhan (1997), Tanzi (1998), Wei (1999), Jain (2001), Aidt (2003, 2009), Rose-Ackerman (1999, 2007), Svensson (2005), Olken and Pande (2012), and Rose-Ackerman and Palifka (2016).

[2]For the effects of corruption in politics, see for example Merton (1968), Huntington (1968), Waterbury (1973, 1976), and Heidenheimer et al. (1989). For the damaging impact of corruption on regime support and legitimacy, see for example Banfield, 1967, Etzioni-Halevy (1983), Della Porta (2000), Seligson (2002), Anderson and Tverdova (2003), Chang and Chu (2006), Gilley (2006), Morris and Klesner (2010), and Rothstein (2011). Guriev and Treisman (2018) show how in recent decades, instead of using mass repression, autocrats have increasingly been manipulating information to convince the public about their competence and win genuine popularity despite prevailing corruption in the state apparatus.

[3]Rose-Ackerman and Palifka (2016, p. 28) summarize the causes and consequences of corruption studied in the literature, and erosion of state power is not mentioned.

[4]For example, see Acemoğlu (2005), Besley and Persson (2008, 2009, 2010), Acemoğlu et al. (2011, 2015), Dincecco and Prado (2012), Padró i Miquel and Yared (2012), Dal Bó et al. (2013), Gennaioli and Voth (2015), Muralidharan et al. (2016), and the survey by Cingolani (2013).

We analyze how corrupt the Center would allow the local official to become. Our notion of corruption is primarily about the exchange of bribes and the building of crony relationships between a local official and firms or members of the population in the official's jurisdiction.[5] Our concept of state power, authority, and control relates to the Center's success in securing the obedience of the local official in times of *crisis,* which we define as those exceptional times when the Center needs urgent support from within the apparatus to implement well-coordinated responses. The crises that are the most relevant are 1) political – wars, secession, revolts, or revolutions – since they may threaten the survival of the incumbent or the regime itself (Tilly, 1990), 2) economic crises with a high risk of contagion, and 3) important natural catastrophes, which can inflict severe damages to society. We focus on this concept of state power because political philosophers and real-world practitioners of power have viewed the ability to respond to exceptional situations, i.e., crises, as a fundamental attribute of state power (e.g., Hobbes, 1651; Schmitt, 1921, 1922; Agamben, 2003; Lincoln, 1953).

In this model, we show that when local corruption creates local vested interests and a crisis striking the Center presents the local official an opportunity to secure these interests, corruption can push the local official to defy the Center's orders during the crisis. Thereby everyday corruption can break the chain of command along the state hierarchy in critical times. Answering the first question above, in this sense corruption can erode state power.

Answering the second question above, we show that under a general condition of fat-tailed risk of crisis, when the Center considers whether to tolerate less local corruption, its concern over the erosion of state power will dominate at the margin any economic sacrifice if there is, be it the Center's share of the generated corruption rents, or sometimes economic performance as well. Therefore, as long as the Center's fiscal capacity can maintain the state apparatus on a daily basis, the Center should follow an *endogenous lexicographic rule* when choosing its corruption tolerance: first, corruption must not exceed a critical threshold so that control is always secured in any possible crisis; second, given that the first condition is satisfied, the Center can tolerate corruption to a certain degree, raising its rents and possibly economic performance as much as possible.

Answering the third question above, we further show that whether the endogenous lexicographic rule is feasible critically depends on the Center's fiscal capacity. When the capacity is not sufficiently strong, the Center has to over-tolerate corruption to retain its subordinates, risking its control in crises. If the capacity is so weak that the over-tolerated corruption implies the Center losing control in any real crisis, any marginal increase in fiscal capacity

[5]For examples of the coverage of this type of corruption over clientelism, the administrative, police, military, judicial, and political realms, and state capture, see Ezrow and Frantz (2013, p. 257–273). We also discuss in Online Supplement A the applicability of our model to other types of corruption, such as diversion of funds or embezzlement.

will not help the Center regain its power. It is thus possible for the Center to have little incentive at the margin to invest in fiscal capacity.

Guided by these theoretical results, we develop historical narratives on corruption, state power, and fiscal capacity. Consistent with our model, we first find that the state's ability to react in times of crisis has repeatedly been eroded by corruption throughout history, as in the Roman Empire and many other powerful empires, precisely because corruption creates an incentive misalignment along the state hierarchy. As predicted by the endogenous lexicographic rule, we further find that in the history of the New Kingdom of Egypt and many other states, corruption was both pervasive and controlled at the same time, so that potential loss of control was preempted; in particular, rising concerns of a potential crisis could push the head of the state to crack down on corruption. Finally, we find that during the decline of the Ming China and a few other historical empires, the retention problem created by weak fiscal capacity caused over-tolerance of corruption, and there existed a trap of weak fiscal capacity, rampant corruption, and the Center losing political control in any real crisis, all as predicted by the role of fiscal capacity in our model.

Our results help clarify the relationship between corruption and a weak state: does corruption indicate or make a weak state? Our results imply that it is important to distinguish between a *fiscally* weak state and a *politically* weak state. In our model, a fiscally weak state has to over-tolerate corruption; at the same time, corruption may be largely present in a fiscally strong state, too, but it does so subject to such control so that the state remains politically strong. Therefore, on the one hand, corruption does not necessarily indicate a *fiscally* weak state; on the other hand, despite its corrosive nature, corruption makes the state *politically* weak only when the state is *fiscally* weak. Relatedly, Ma and Rubin (2019) develop a model for absolutist regimes where weak fiscal capacity and rampant corruption can emerge in equilibrium as a solution to the commitment problem created by the ruler's absolute power. We emphasize instead that the ruler's absolute power can be compromised in crises by everyday corruption, whereas the ruler's ability to restrain this effect is constrained by his fiscal capacity; in the extreme, too weak fiscal capacity will lead to too much corruption and a total loss of absolute power in any real crisis, which may in turn make the too weak fiscal capacity persistent.

The paper is organized as follows. Section 2 introduces and discusses the setup of the model. Section 3 analyzes the model and derives the theoretical results. Section 4 discusses the relevance of the theoretical results to history. Section 5 concludes.

2 Setup of the Model

The model is a sequential game. Figure 1 presents its extensive form. There are two players: the Center, representing the highest level of the state apparatus, and a local official, representing all officials at lower levels of the hierarchy.

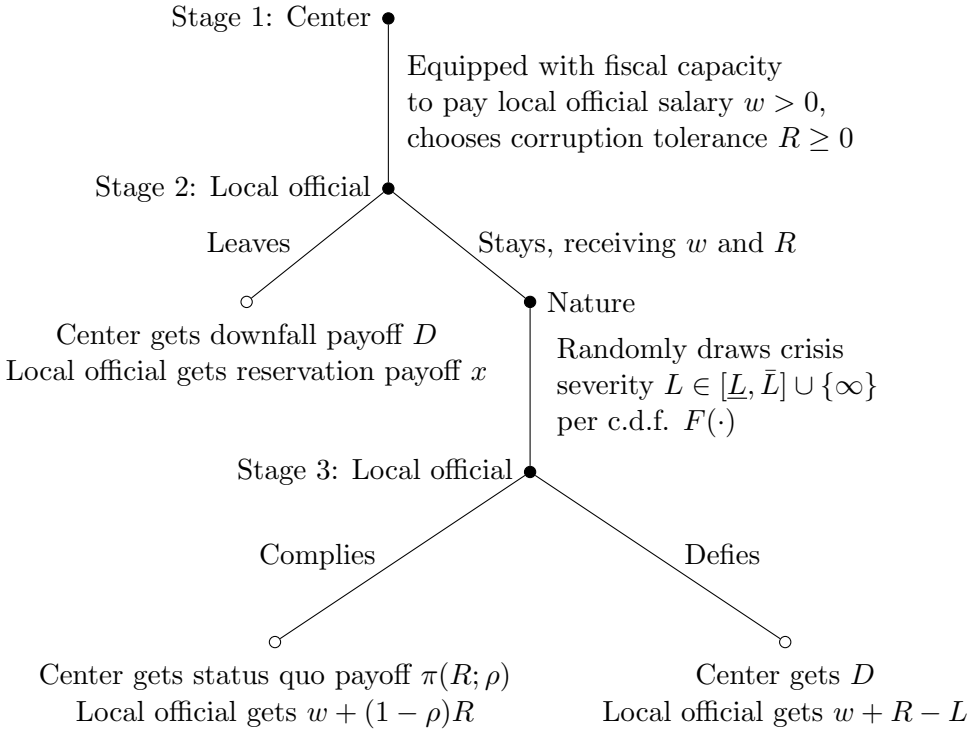

Figure 1: Extensive form of the game

At Stage 1, the Center chooses the level of rents $R \geq 0$ that it allows the local official to obtain through corruption in his jurisdiction. Besides this corruption tolerance, the Center is equipped with some fiscal capacity to pay an exogenous salary $w > 0$ to the local official.

At Stage 2, the local official chooses to leave or stay in the state hierarchy, and we assume that he will stay if indifferent. If he chooses to leave, the state apparatus will be short of staff and the Center will face its downfall. The game will then end, with the Center getting an exogenous payoff D for its downfall, while the local official gets an exogenous reservation payoff x.

If the local official chooses to stay, he will receive the salary $w > 0$ and also obtain the corruption rents. Nature will then randomly draw a crisis severity level L from an exogenous distribution. The crisis of this severity will then strike the Center, and the game will move into Stage 3.

At Stage 3, the local official chooses whether to comply with the orders from the Center

and help survive the crisis. We assume that he will defy if indifferent. If he does comply, the game will end with the status quo being maintained, in which the local official is assumed to share an exogenous share $\rho \in (0,1)$ of his obtained rents, ρR in total, with the Center. The eventual payoff of the local official is then $w + (1-\rho)R$. The Center is assumed to get a status quo payoff $\pi(R;\rho)$.

If the local official chooses to defy, the status quo will end and the local official will no longer have to share his rents with the Center. The realization of crisis severity L enters here as the loss that the local official suffers in this scenario. The eventual payoff of the local official is then $w + R - L$. Since the Center has lost control of the state apparatus, we assume that the Center eventually gets the downfall payoff D.

We assume that the players maximize their own expected payoffs. We also assume complete, perfect, and symmetric information. Therefore, we use backward induction when solving the model.

Before analyzing the model, we make a few remarks about the setup and interpretation of the model, along with three additional assumptions that help maintain realistic outcomes:

Crisis and its severity. First, the crisis severity L can be interpreted as the punishment that the Center can impose on the local official for his potential defiance, or as the collateral damage that the Center's downfall may inflict on the official. This is consistent with the idea that, when a crisis strikes the Center, the Center's ability to force the local official to comply and help survive the status quo is weakened; the more severe the crisis, the weaker this expected ability.[6]

Note that a smaller L in the model proxies a more severe crisis. Denoting L's cumulative distribution function and probability density as $F(\cdot)$ and $f(\cdot)$, respectively, we further specify the distribution of L as follows:

Assumption 1 (Distribution of crisis severity)**.** *When $L \leq \underline{L}$, $F(L) = 0$; when $\underline{L} < L < \bar{L}$, $F(L) \in (0,p)$ is differentiable and $f(L) > 0$ everywhere; when $\bar{L} \leq L < \infty$, $F(L) = p \in (0,1)$; when $L = \infty$, $F(L) = 1$.*

In other words, with probability $1-p$, no real crisis will strike and the Center will be infinitely capable of forcing the local official to obey and maintain the status quo; with probability p, however, a real crisis may occur; the most severe crisis possible is denoted by $\underline{L} \in (0,\infty)$, whereas the least severe crisis possible is denoted by $\bar{L} \in (\underline{L},\infty)$.

[6] In particular, since any punishment would be conditional on the Center's survival (e.g., Egorov and Sonin, 2011), the Center's enforcing ability is weakened in expectation during crises. This idea can also be micro-founded by the Rubinstein (1982) protocol where a crisis makes the Center become less patient, lose bargaining power, and, therefore, become weaker in forcing the local official to obey orders.

In the current setup, the distribution of L is exogenous to existing corruption; in Section 3.1, we show that our result is robust when the distribution of L is endogenous to the level of corruption R; in Online Supplement A, we extend the model by introducing, in case of defiance, an additional loss to the local official that is dependent on R, and we discuss the implications.[7] In the current setup, the crisis also does not affect the local official's salary or corruption rents; in Section 3.1, we show that our result is robust when allowing for such effects.

Rent-sharing arrangement. Second, the rent-sharing arrangement ρ in the status quo is assumed to be exogenous. We can interpret a higher ρ as either more obligations or effort that maintenance of the status quo would require from the local official, or a more corrupt or dominant Center in the status quo central–local relationship. In Online Supplement C, we analyze how ρ affects the Center's calculation and explore how the Center would choose ρ if it had the choice.

Status quo payoff. Third, the dependence of the Center's status quo payoff $\pi(R;\rho)$ on the prevalence of corruption R can come from various sources. First of all, the Center can value the performance of the economy because, for example, better economic performance can generate greater tax revenues or stronger popular support, and there are arguments for both corruption "greasing" and "sanding the wheels" of the economy (e.g., Leff, 1964; Shleifer and Vishny, 1993). Moreover, the Center can also value the rents ρR that it reaps from the local official. Since the reaped rents ρR also depend on ρ, the status quo payoff also depends on the rent-sharing arrangement ρ, which is a parameter in $\pi(R;\rho)$. To preserve generality, we assume $\pi(R;\rho)$ to be continuous and differentiable in R and ρ but leave the signs of the first-order derivatives $\pi_R(R;\rho)$ and $\pi_\rho(R;\rho)$ unspecified.[8] All results in the main text do not depend on these signs.

Downfall payoff. Fourth, we make two additional assumptions to make sure that the Center's downfall payoff is sufficiently low:

Assumption 2. $D < \inf_{R\geq 0} \pi(R;\rho)$.

[7] We keep the distribution of L exogenous in the current setup also because, first, the crisis severity in reality always has an exogenous component and, second, the exogeneity highlights in our model the essence of power: power fundamentally means that the person at the lower level of the hierarchy will comply with the higher level, *whatever* the situation may be. This *arbitrariness* of the situation is exactly captured by the exogeneity of L.

[8] If the Center's rent-seeking motive dominates its concern for economic performance, or if corruption is "greasing the wheels" of the economy so much, higher corruption tolerance will raise the status quo payoff.

This assumption narrows our focus to the scenarios in which the Center always prefers the status quo to downfall, which is reasonable. Assumption 2 itself does not imply that the Center will always prevent the eventuality of a downfall. This is because the Center's status quo payoff and survival probability could move in opposite directions when the corruption tolerance R changes, depending on the properties of the other parts of the model, i.e., $\pi(R;\rho)$, x, w, and $F(\cdot)$. It is thus a priori unclear whether the Center will prefer the status quo to be totally or only partially secured.

Assumption 3. $D < \left(\inf_{R\geq 0}\pi(R;\rho) - (1-p)\cdot\sup_{R\geq 0}\pi(R;\rho)\right)/p$.

Assumption 3 further narrows our focus to the cases in which the Center also always prefers the status quo to any situation where it will lose control in any real crisis, which is also reasonable. Assumption 3 does so because it is equivalent to $\inf_{R\geq 0}\pi(R;\rho) > p\cdot D + (1-p)\cdot\sup_{R\geq 0}\pi(R;\rho)$, where the left-hand side is the minimum that the status quo can provide, whereas the right-hand side is the maximum that the Center can expect if it will lose control in any real crisis. Like Assumption 2, this assumption itself does not imply that the Center will prefer the status quo to be totally or partially secured.

Fiscal capacity. Finally, the Center's fiscal capacity is modeled as its ability to pay and retain the local official without allowing him to take bribes. It is measured by the difference between the local official's reservation payoff x and salary w, i.e., $x - w \in (-\infty, \infty)$; the higher this difference, the weaker the capacity. In Section 3.4, we analyze the Center's incentive to invest in fiscal capacity. In Online Supplement E, we endogenize the salary w by defining fiscal capacity as a budget, subject to which the Center chooses the salary while the rest of which can be saved to serve as an additional, conditional incentive to enforce the local official's compliance during crises; all main results remain robust.[9]

3 Analysis of the Model

3.1 Stage 3

At this stage, having received the salary w and corruption rents R and learned the realization of the crisis severity L, the local official will defy if and only if

$$w + (1-\rho)R \leq w + R - L. \tag{1}$$

[9]One can argue that the level of corruption R can affect the Center's fiscal capacity through economic performance, which can be captured by $\pi(R;\rho)$. How this effect would complicate the Center's decision in Stage 1 would depend on the micro-foundation of $\pi(R;\rho)$. As we have kept $\pi(R;\rho)$ in the reduced form, we keep fiscal capacity exogenous to R.

This is equivalent to ρR being sufficiently big, or the crisis being sufficiently severe:

$$L \leq \rho R \equiv \hat{L}(R), \tag{2}$$

where $\hat{L}(R)$ is the critical threshold of the crisis severity at which the local official will switch between complying and defying.

A higher corruption tolerance R will thus raise the critical threshold $\hat{L}(R)$ because it increases the vested interests ρR for the local official to secure during any crisis. Given the distribution of L, this higher threshold suggests a higher likelihood $F(\hat{L}(R))$ of the local official's eventual defiance and a lower probability $1 - F(\hat{L}(R))$ for the Center to eventually keep control in the potential crisis. This is the corrosive effect of corruption on state power:

Proposition 1 (Corrosive corruption)**.** *There exist* $\underline{R} \equiv \underline{L}/\rho$ *and* $\bar{R} \equiv \bar{L}/\rho$ *such that when* $0 \leq R \leq \underline{R}$, $1-F(\hat{L}(R)) = 1$*; when* $\underline{R} \leq R \leq \bar{R}$, $1-F(\hat{L}(R))$ *continuously, strictly decreases from* 1 *to* $1-p$ *as* R *increases from* $\underline{R}$ *to* $\bar{R}$*; when* $\bar{R} \leq R < \infty$, $1 - F(\hat{L}(R)) = 1 - p$.

The proposition directly follows $\hat{L}(R) = \rho R$ and Assumption 1. The threshold $\underline{R}$ is the corruption level at which the Center just secures perfect control in any crisis, while the threshold $\bar{R}$ is the corruption level at which the Center just loses control in any real crisis. If corruption is limited ($R \in [0, \underline{R}]$), then the Center will never lose control in any crisis; if corruption is over-tolerated ($R \in [\underline{R}, \bar{R}]$), the Center starts to risk its crisis control and higher corruption will erode crisis control; if corruption is sufficiently over-tolerated ($R \in [\bar{R}, \infty)$), the Center will lose control in any real crisis and the status quo can be maintained only when no real crisis strikes.

Remarks. Although derived from a simple setting, Proposition 1 is robust to alternative settings. First, instead of rent-sharing, the status quo could require the local official to submit a fixed fee. In this setting, the probability that the local official will defy would still weakly increase with the corruption rents.[10]

Second, one can argue that corruption can shift the distribution of crisis severity in the wrong direction by creating more social discontent, or through other channels generating similar effects. In that case, the corruption rents would further decrease the probability of crisis control, but from an additional channel, and would not modify the thrust of our result.

Third, one can imagine that as the crisis shocks the regime, a more severe crisis could lower the local official's rents or affect his salary. In that case, as long as the post-crisis

[10]The defiance condition would become $w + R - \min\{M, R\} \leq w + R - L$, where M is the fixed fee. Then the focal probability would be $F(\min\{M, R\})$, which weakly increases with R.

and pre-crisis rents are positively correlated given the crisis severity, the corrosive effect of corruption will still hold.[11]

Finally, one can argue that during the collapse of the status quo the local official might lose a share of the corruption rents. As shown in Online Supplement A, the corrosive effect of corruption will hold, as long as this share is not too large. Online Supplement A further provides justifications for this condition.

3.2 Stage 2

Understanding his own Stage-3 decision as analyzed, the local official has to decide at Stage 2 whether to stay in the state hierarchy. He will stay if and only if

$$x \leq w + \mathbf{E}_L[\max\{(1-\rho)R, R-L\}] = w + R - \mathbf{E}_L[\min\{\rho R, L\}]. \tag{3}$$

If we denote the expected rents the local official will eventually gain after Stage 3 by $X(R) \equiv R - \mathbf{E}_L[\min\{\rho R, L\}]$, this condition is equivalent to

$$X(R) \geq x - w, \tag{4}$$

which means that the local official will stay if his expected rents cover the gap between his reservation payoff and salary.

The expected rents $X(R)$ has the following property:

Lemma 1 (Local official's expected rents)**.** *$X(R)$ strictly and continuously increase from 0 to ∞ as R increases from 0 to ∞.*

Proof. By the definition of $X(R)$ and Assumption 1, we have that when $R \in [0, \underline{R}]$, $X(R) = (1-\rho)R$; when $R \in (\underline{R}, \bar{R})$, $X(R) = R - \int_{\underline{L}}^{\rho R} L dF(L) - \rho R\left(1 - F(\rho R)\right)$ and $X'(R) = 1 - \rho\left(1 - F(\rho R)\right) > 0$; when $R \in [\bar{R}, \infty)$, $X(R) = \left(1 - (1-p)\rho\right)R - p \cdot \int_{\underline{L}}^{\bar{L}} L dF(L)$. The result then follows the fact that $\rho \in (0,1)$. □

This result is intuitive in the sense that the higher the rents R that the local official will have obtained before Stage 3, the higher the local official's expected rents $X(R)$ after Stage 3. We can then characterize Stage 2 as follows:

Lemma 2 (Scenarios depending on fiscal capacity)**.** *The model has two scenarios:*

[11] To see this point, suppose that the salary is $w(L)$, a function of the crisis severity L, and the post-crisis rents are $R'(R, L)$, a function of the pre-crisis rents R and the crisis severity L. The defiance condition would become $w(L) + (1-\rho)R'(R,L) \leq w(L) + R'(R,L) - L$, i.e., $R'(R,L) \geq L/\rho$. Therefore, if $R'(R,L)$ is increasing in R, then the local official will defy only when R is sufficiently high.

1. *when $x - w \leq 0$, the local official will always stay in the state apparatus at Stage 2 regardless of the Center's choice of $R \in [0, \infty)$;*

2. *when $x - w > 0$, the local official will stay if and only if $R \geq r$, where $r > 0$ uniquely solves $X(r) = x - w$ and increases with $x - w$.*

This lemma suggests that in Scenario 1 when the Center's fiscal capacity is sufficiently strong ($x - w \leq 0$), no gap between the reservation payoff and salary needs to be covered. The local official will thus always stay. In Scenario 2 when the Center's fiscal capacity is not as strong ($x - w > 0$), the Center will face a problem to retain the local official and its choice of corruption tolerance R will have to be sufficiently high ($R \geq r$).

3.3 Stage 1, Scenario 1 (No Retention Problem)

All the analysis above suggests that the Center's choice of corruption tolerance R creates central–local incentive misalignment in crises at Stage 3 and decides whether the expected rents $X(R)$ at Stage 2 can cover the gap between the local official's salary and reservation payoff. To understand the Center's choice of R, given Lemma 2, we first analyze Stage 1 in Scenario 1. By muting the retention problem at Stage 2, this scenario helps us isolate out the Center's concern about crisis control. After that we turn to Scenario 2, bringing the retention problem back and investigating the implications of weaker fiscal capacity.

In Scenario 1, the local official will always stay regardless of the Center's choice of R. The Center's program is then

$$\max_{R} \quad \big(1 - S(R)\big) \cdot D + S(R) \cdot \pi(R; \rho) = D + S(R) \cdot \big(\pi(R; \rho) - D\big), \quad \text{s.t.} \quad R \geq 0, \quad (5)$$

where the Center's political stability $S(R)$, i.e., the probability that it will survive at the end of the game, is

$$S(R) = 1 - F(\hat{L}(R)), \text{ in which } \hat{L}(R) = \rho R. \quad (6)$$

This program suggests that, given Assumption 2 ($\pi(R; \rho) > D$) and a sufficiently strong fiscal capacity ($x - w \leq 0$), the Center can face a trade-off: a higher R will lead to loss of control in some crises and, therefore, a lower political stability $S(R)$, but it can grant a higher status quo payoff $\pi(R; \rho)$ whenever $\pi_R(R; \rho) > 0$. This trade-off, if exists, is truly political–economic, since one side of the trade-off is political: making sure that the local official will comply with the Center, whatever the severity of the crisis would be; the other side is economic: it is about the payoff under the status quo.

We now derive the main result about the trade-off – a sufficient condition about the risk

distribution under which the political side will dominate the economic side, and the Center will thus choose a corruption tolerance that does not pose any risk to power at all:

Proposition 2 (No retention problem)**.** *If $x - w \leq 0$, and if, for any $L \in (\underline{L}, \bar{L})$,*

$$\frac{L \cdot f(L)}{1 - F(L)} \equiv \epsilon > \bar{\epsilon} \equiv \max_{R \in [\underline{R}, \bar{R}]} \frac{\pi_R(R; \rho) \cdot R}{\pi(R; \rho) - D}, \tag{7}$$

then the Center's optimal choice $R^* \in \arg\max_{R \in [0, \underline{R}]} \pi(R; \rho)$, which implies $R^* \leq \underline{R}$ and $S(R^*) = 1$.

Proof. First, by Assumptions 2 and 3 and Proposition 1, the Center must prefer any $R \in [0, \underline{R}]$ to any $R \in (\bar{R}, \infty)$, because the former would secure perfect crisis control and the latter would make the Center lose any crisis control. Second, by $\hat{L}(R) = \rho R$, the Center's expected payoff will be strictly decreasing over $R \in \big(\underline{R}, \bar{R}\big)$, if and only if the marginal gain from additional security brought by a slightly lower corruption tolerance dominates the marginal sacrifice, if there is any, in the status quo payoff, i.e., $-S'(R) \cdot \big(\pi(R; \rho) - D\big) > S(R) \cdot \pi_R(R; \rho)$. By $S(R) = 1 - F(\hat{L}(R))$, $\hat{L}(R) = \rho R$, and Assumption 2, this condition is equivalent to

$$\frac{f(\hat{L}(R)) \cdot \hat{L}(R)}{1 - F(\hat{L}(R))} > \frac{\pi_R(R; \rho) \cdot R}{\pi(R; \rho) - D}. \tag{8}$$

By $\epsilon > \bar{\epsilon}$, this condition holds. Therefore, the Center's expected payoff is strictly decreasing over $R \in (\underline{R}, \bar{R})$. Therefore, the optimal choice $R^* \in [0, \underline{R}]$ must hold. The proposition then follows. □

The key step in the proof is to recognize that when the crisis risk distribution is sufficiently fat-tailed or thick-ended ($\epsilon > \bar{\epsilon}$), a severe crisis is sufficiently likely at the margin, so the gain from any additional control by lowering the corruption tolerance will always dominate the marginal sacrifice, if there is any, in the status quo payoff. The Center will thus follow an *endogenous lexicographic rule* when choosing the corruption tolerance: perfect crisis control first, the status quo payoff second.

Remarks. Several remarks can be made about the endogenous lexicographic rule. First, it is *lexicographic,* since it specifies that the Center foremost maximizes control in crises; given that perfect control is secured, the Center then adjusts the corruption tolerance to maximize the status quo payoff.

Second, it is a decision *rule,* not a *preference* between power and the economic payoff in the status quo. In our model, there is only one thing that matters in the Center's preference,

which is the payoff. Power, control, and authority only have instrumental value because they can increase the Center's expected payoff.

Third, it is *endogenous*, different from the assumption of "power first" as an *axiom* for political agents and organizations (e.g., Downs, 1957; Roemer, 1985; Svolik, 2009). Instead, we provide a consequentialist justification for this assumption.

Fourth, the key condition for the endogenous lexicographic rule is the fat-tailed condition $\epsilon > \bar{\epsilon}$. Indeed, we show in Online Supplement B that unsecured control can be optimal if the risk of crisis is instead sufficiently thin-tailed; it is because the marginal sacrifice in the status quo payoff, if there is, will dominate the marginal gain of better control in crises.

Finally, the fat-tailed condition $\epsilon \equiv L \cdot f(L)/(1 - F(L)) > \bar{\epsilon}$ is hardly controversial and arguably general. It suggests that the Center's perceived probability of extremely bad situations does not decrease too quickly. This is consistent with the notion that "crises are difficult to learn about because they are by definition infrequent, low-probability events" (Taylor, 2009, p. 1243), often described by practitioners of power as "black swans" (e.g., People's Daily, 2019); it is also consistent with the common approach to modeling crises in the literature across disciplines.[12] Therefore, one can argue that, under sufficiently strong fiscal capacity that retention is not of great concern, the endogenous lexicographic rule is quite general.

Comparative statics. We now turn to comparative statics of Proposition 2. There are two important exogenous parameters in Proposition 2: the greatest possible severity of the crisis $\underline{L}$ and the rent-sharing arrangement ρ.

Corollary 1 (Additional crisis risk)**.** *Following Proposition 2, R^* is weakly increasing in $\underline{L}$.*

Proof. Proposition 2 implies $R^* \in \arg\max_{R \in [0, \underline{R}]} \pi(R; \rho)$, where the upper bound of the range $\underline{R} = \underline{L}/\rho$ is strictly increasing in $\underline{L}$. The corollary then follows. □

Corollary 1 predicts that when additional risk of crisis arises (lower $\underline{L}$), the Center may crack down on corruption (lower R^*). We will discuss the relevance of this prediction in Section 4.2.

[12] For examples, see Resnick (2007), Taleb (2007), Bremmer and Keat (2009), Taylor (2009), Weitzman (2009, 2011), Barro and Jin (2011), Pindyck (2011), Cooke et al. (2014), and Ackerman (2017). The fat-tailed condition is also consistent with the etymology of the word *crisis* – it comes from the Greek word *κρίσις,* which means *decision,* and describes "a state of affairs in which a decisive change for ... worse is imminent" (OED2, 1989). The measure we use for the tail fatness or end thickness, i.e., $\epsilon \equiv L \cdot f(L)/(1 - F(L))$, is asymptotically equivalent to the tail index in the literature (e.g., Cooke et al., 2014, p. 2) and can apply to the finite case (e.g., Aban et al., 2006). For example, suppose L follows a uniform distribution between $\underline{L}$ and $\bar{L}$. The condition $\epsilon > \bar{\epsilon}$ is thus equivalent to $\underline{L}/(\bar{L} - \underline{L}) > \bar{\epsilon}$, which means the distribution of the crisis severity is sufficiently heavy at the more severe end, consistent with the notion of catastrophic risk.

The comparative statics with respect to the rent-sharing arrangement ρ is generally ambiguous, however. This is because we have not specified the way that ρ comes into the status quo payoff $\pi(R;\rho)$. That said, the rent-sharing arrangement has a paradoxical role in the model: the Center's weakness in a crisis comes precisely from the rents that it would obtain under the status quo. In Online Supplement C, we discuss the paradoxical role, derive a clear-cut result of comparative statics given more restrictions on $\pi(R;\rho)$, and explore the Center's choice of the rent-sharing arrangement.

3.4 Stage 1, Scenario 2 (Weaker Fiscal Capacity)

Scenario 2 helps us investigate whether fiscal capacity could play a role in breaking Proposition 2, since the weaker fiscal capacity in this scenario makes retaining the local official a real challenge for the Center. In this scenario, by Lemma 2, the Center's program is

$$\max_{R} \quad \big(1 - S(R)\big) \cdot D + S(R) \cdot \pi(R;\rho), \quad \text{s.t.} \quad R \geq 0, \tag{9}$$

where

$$S(R) = \mathbf{1}_{R \geq r} \cdot \Big(1 - F(\hat{L}(R))\Big), \ \hat{L}(R) = \rho R, \text{ and } r > 0 \text{ uniquely solves } X(r) = x - w. \tag{10}$$

To solve the program, first note that if the Center's choice of R cannot retain the local official, the Center will face downfall for sure. Second, by Assumption 2, the Center will prefer any status quo to downfall. Third, if the local official does stay at Stage 2, the Center can for sure maintain the status quo at the end of Stage 3 if no real crisis strikes, which will happen with probability $1 - p > 0$. Therefore, the Center will prefer to retain the local official as long as it is feasible.

It is indeed feasible, by Lemma 2, because the Center can always choose $R \geq r$. The Center's program is thus reduced to

$$\max_{R} \quad \big(1 - S(R)\big) \cdot D + S(R) \cdot \pi(R;\rho), \quad \text{s.t.} \quad R \geq r, \tag{11}$$

where

$$S(R) = 1 - F(\hat{L}(R)), \text{ in which } \hat{L}(R) = \rho R. \tag{12}$$

The Center's optimal corruption tolerance then depends on its fiscal capacity:

Proposition 3 (Retention problem likely)**.** *If $x - w > 0$, and if, for any $L \in (\underline{L}, \bar{L})$, $\epsilon > \bar{\epsilon}$, then the Center's optimal choice R^* follows:*

- *when $0 < x - w < X(\underline{R})$, $R^* \in \arg\max_{R \in [r, \underline{R}]} \pi(R;\rho)$, which implies $S(R^*) = 1$;*

- *when* $X(\underline{R}) \leq x - w < X(\bar{r})$, $R^* = r$, *which implies* $S(R^*) = 1 - F(\rho R^*) \in (1-p, 1)$;
- *when* $x - w \geq X(\bar{r})$, $R^* \in \arg\max_{R \geq \max\{r, \bar{R}\}} \pi(R; \rho)$, *which implies* $S(R^*) = 1 - p$,

where $\bar{r} \equiv \bar{R}$, *if* $\pi(\bar{R}; \rho) \geq \sup_{R > \bar{R}} \pi(R; \rho)$; *if otherwise,* $\bar{r} \in (\underline{R}, \bar{R})$ *uniquely solves* $F(\rho\bar{r}) \cdot D + \big(1 - F(\rho\bar{r})\big) \cdot \pi(\bar{r}; \rho) = pD + (1-p) \cdot \sup_{R > \bar{R}} \pi(R; \rho)$.

We leave the proof of Proposition 3 to Appendix A and only discuss the intuition here. The fat-tailed risk of crisis, as in Proposition 2, still makes the Center care about crisis control before the status quo payoff. When the state is still fiscally sound ($x - w < X(\underline{R})$), some choice of the corruption tolerance that would secure perfect control can still secure retention, so the Center will still adopt the lexicographical rule in Proposition 2, only modifying it by first securing retention and crisis control simultaneously ($R^* \in \arg\max_{R \in [r, \underline{R}]} \pi(R; \rho)$).

Given a medium fiscal capacity ($X(\underline{R}) \leq x - w < X(\bar{r})$), however, any choice of the corruption tolerance that would secure perfect control would not allow retention, so the Center has to over-tolerate corruption, risking but still maximizing crisis control, i.e., choosing the corruption tolerance that is just sufficient to retain the official ($R^* = r$).

When the fiscal capacity is too weak ($x - w \geq X(\bar{r})$), to retain the local official, the Center has to over-tolerate corruption so much that it will lose control in any real crisis. The Center will then simply maximize the status quo payoff while making sure retention is achieved ($R^* \in \arg\max_{R \geq \max\{r, \bar{R}\}} \pi(R; \rho)$).

Incentive of fiscal capacity investment. As Proposition 3 implies that the retention problem given weak fiscal capacity may prevent the Center from securing perfect control in crisis, will the Center always have a strictly positive incentive to invest in fiscal capacity? Denoting the Center's expected payoff given his optimal choice of corruption tolerance R^* as V, the answer is as follows:

Corollary 2 (Weak-capacity trap)**.** *Following Proposition 3,*

- *if* $X(\underline{R}) \leq x - w < X(\bar{r})$, *then* $dS(R^*)/d(w-x) > 0$ *and* $dV/d(w-x) > 0$;
- *if* $x - w \geq X(\bar{r})$, *then* $dS(R^*)/d(w-x) = 0$; *further, if* $R^* > r$, *then* $dV/d(w-x) = 0$.

We leave the proof of Corollary 2 to Appendix B and only discuss the intuition here. Given a medium fiscal capacity ($X(\underline{R}) \leq x - w < X(\bar{r})$), strengthening fiscal capacity will allow the Center to tolerate a lower level of corruption for retention and, therefore, strengthen the Center's crisis control ($dS(R^*)/d(w-x) > 0$). Given the fat-tailed risk of crisis, this will make the Center better off overall ($dV/d(w-x) > 0$). The incentive for the Center to invest in fiscal capacity will thus be strictly positive.

If the fiscal capacity is too weak ($x - w \geq X(\bar{r})$), instead, the Center will lose control in any real crisis. Given that, since any marginal increase in fiscal capacity would not substantially strengthen the Center's crisis control, there is not any political incentive for fiscal capacity investment ($dS(R^*)/d(w-x) = 0$); as the Center has been maximizing only the status quo payoff, if doing so has led to so much corruption that the retention constraint is not even binding ($R^* > r$), then there will not be any economic incentive for fiscal capacity investment either. Therefore, the Center's total incentive to invest in fiscal capacity will be exactly zero ($dV/d(w-x) = 0$).

Corollary 2 predicts that the Center with a too weak fiscal capacity will not have any political incentive to invest in fiscal capacity, and lays out the condition under which there will not be any economic or overall incentive either. Whereas fiscally intermediate states would generally try to improve their fiscal capacity, a trap of too weak fiscal capacity and low political stability may appear. We will discuss the relevance of these implications in historical examples in Section 4.3.

4 Relevance of the Theory in History

On the relevance of the model in the contemporary world, we discuss in Online Supplement D how Corollary 1 above and Corollary S1 in Online Supplement C can help understand the observed correlation between personalistic rule and corruption; with recent cross-country panel-data we show in Li et al. (2019b) that corruption and political stability are correlated only when fiscal capacity is at an intermediate level, consistent with the implications of Propositions 2 and 3. In this section, we focus on the relevance of the model in history instead. When doing so, we discuss three sets of historical examples, corresponding to the three sets of theoretical results – the corrosive effect of corruption (Proposition 1), corruption controlled for perfect crisis control (Proposition 2 and Corollary 1), and the role of fiscal capacity (Proposition 3 and Corollary 2).

4.1 Corrosive Effect of Corruption

Proposition 1 predicts that corruption has such a corrosive effect that it will compromise the Center's authority over the state apparatus when it is urgently needed. It also outlines the mechanism for this effect: corruption creates vested interests for officials to secure despite the Center's call for service. A prominent example that is consistent with this prediction and the mechanism can be found in the decline of the Roman Empire.

Roman Empire. Citing Ammianus (c. 391), Jones (1964), and Rougé (1966), MacMullen (1988, p. 182) examines why in the mid-350s the Isaurians around southwestern Anatolia "were well established as a quite uncontrollable force" threatening the Empire. This was because when Roman officials were ordered to clean up the threat, these officials "were busy raking together their spoils from the subject population under them" (MacMullen, 1988, p. 182). Defying the Emperor's will to attack the Isaurians, "no one [official did] say [the Isaurians] nay," the officials "were not very aggressive," and they tried instead to secure their own interests (MacMullen, 1988, p. 182). In one infamous case, as told by Zosimus (c. 518) and Martindale (1980, p. 127–128) and cited by MacMullen (1988, p. 183), "the military Count Arbazacius, [who was] dispatched to the aid of villas and villages" but "wanting wealth and the pleasures of wealth," even "'shook down' the Isaurian leaders for a part of their plunder [and] relaxed his military efforts," earning him the nickname "Harpazacius" – "the grabber" – from his contemporaries. To secure their own interests, officials also frequently went further to fight against each other, i.e., "behind their own walls" (MacMullen, 1988, p. 182).

The corrosive effect of corruption was quite common within the Roman regular army on other frontiers. For example, MacMullen (1988) notices Ammianus (c. 391)'s record about a similar situation on the Persian frontier in 356. According to Ammianus (c. 391) and MacMullen (1988, p. 175), all the "lust for plunder" generated likewise lack of "discipline, energy, and courage" inside the regular Roman army.

This erosion of central authority was highlighted at the Battle of Adrianople in 378 between the Eastern Roman Emperor Valens and the Gothic rebels: as pointed out by MacMullen (1988, p. 185), "what ... appears most striking is the contrast between the supposed great forces available to Valens and his sorry performance in bringing them to bear." Consequently, Valens was killed at Adrianople, "marked among the most inauspicious of the Roman Calendar" (Gibbon, 1781, p. 613), and the defeat "set in motion the chain of events that would lead, nearly a century later, to the fall of the Western Roman Empire" (Barbero, 2008, p. 1). Both the mechanism and the consequences of the corrosive effect of corruption are consistent with Proposition 1.

Other examples. The same effect was commonplace among other historical empires. For example, in the Mamluk Sultanate of Egypt, senior Mamluks employed their junior protégés to seek rents from the civilian population, accumulating such great fortunes that their loyalty toward the Sultan was replaced by economic calculus (Petry, 1998, p. 468; Fukuyama, 2011, p. 209). As a result, the Mamluks often intentionally delayed answering the Sultan's call for service and helped challengers supplant the Sultan (Petry, 1998, p. 468). The

same causality from rent-seeking, creation of vested interests, to disloyalty applied to the relationship between the Janissaries and the Sultan in the Ottoman Empire (Itzkowitz, 1972, p. 89–92; Finer, 1997c, p. 1208; Fukuyama, 2011, p. 223–227). On late Valois France, Finer (1997c, p. 1309) argues that the rent-seeking behavior by the permanent civil service contributed to the "collapse" of "the entire edifice" of the king's power and its inability to respond to wars and resurgences. On British India, Pavarala (2004, p. 293, 295) observes that the trade interests of the East India Company were developed along with "the so-called 'Indian fortunes' made by East India Company officials," accompanied by "the struggle that marked most of the eighteenth century between the state [Center in London] and the Company for control over India." All these examples are consistent with Proposition 1.

4.2 Corruption Control and Political Stability

Despite the corrosive effect in Proposition 1, given the general fat-tailed condition for the risk of crisis, Proposition 2 predicts that whenever feasible, the Center will keep corruption checked to secure its crisis control. Indeed, as MacMullen (2015, p. 10–11) once remarked, "[a]lthough corruption has been pervasive in all times of history and even in the most powerful empires, more than often it has been under control and has not led to disastrous consequences comparable to the case of the Roman Empire." A fitting example can be found in the history of the New Kingdom of Egypt, i.e., the 18th–20th Dynasties of Egypt (16th–11th centuries BC).

New Kingdom of Egypt. Given its dictatorial state and command economy, corruption was pervasive in the New Kingdom (Finer, 1997a, p. 199). "[T]he courts were frequently prejudiced or corruptible" (Finer, 1997a, p. 199), and in well-documented cases the local officials' cumulation of vested interests through corruption could be "long-continued . . . for ten years" when private contractors "conspired with the clerks, administrators, and peasant-farmers" (Wilson, 1956, p. 279–280). Finer (1997a, p. 202–203, 208–209) observes that it was "inherent" to the New Kingdom's institution that corruption of this kind "dislocated the 'plan'," thereby depriving the central authority of access to certain important resources when needed, such as grains, ores, timbers, chariots, and corvées. All these observations are consistent with the corrosive effect of corruption depicted in Proposition 1.

It was thus remarkable that, despite being "a monument of . . . corruption," the New Kingdom "did endure, stably, for four centuries" (Finer, 1997a, p. 199). Only the Han Empire in the Chinese history was comparable to "virtually all these 370 years" when the New Kingdom "was governed stably and well," and "[n]either Persia nor Rome nor Byzantium could show such stability over so long a period" (Finer, 1997a, p. 179). In particular, despite

the fact that "the peasantry were all ... in a servile condition" (Finer, 1997a, p. 205), "[t]here were no civil disturbances ... or revolts ... that could not be handled by the police" until the end of the 20th Dynasty (Finer, 1997a, p. 198, 205). Even when Pharaoh Akhenaten was implementing his extremely unpopular religious revolution (1350s–1330s BC), "his rule was effective, the army obedient, ... without resistance of any kind as far as our information goes" (Finer, 1997a, p. 181). Even more remarkable was that this impressive stability was achieved despite the "infinite complexity" of the "tightly knit" Egyptian administration, where "a failure in one sector of the system [would weaken] another, and in turn another" (Finer, 1997a, p. 202, 207). Therefore, "[t]he system [would fall] apart" with "a multiplication of ... petty acts" (Finer, 1997a, p. 202, 207). This likely made the risk of crisis fat-tailed, satisfying the key condition of Proposition 2. Consistent with Proposition 2, the corrosive effect of corruption was thus kept well under control.

The control was secured by recurrent crackdowns on corruption (e.g., Wilson, 1956, p. 237–239, 241; Finer, 1997a, p. 184, 202; van Dijk, 2003, p. 284–285). A famous one was implemented by Horemheb, the last pharaoh of the 18th Dynasty. During his actual reign (1323–1295 BC), "a series of police regulations" were "directed against specific malpractices" and "administrative corruption," since "soldiers and officials had been lawlessly using their power to enrich themselves at the expense of common people" (Wilson, 1956, p. 237). The campaign was indeed intense: "[t]he punishments meted out [were] very harsh ... out of all proportion to the offenses," and the "very harsh and reactionary enactment [was] designed to check the deplorable dishonesty of government people" (Wilson, 1956, p. 238–239). Horemheb also conducted a "reorganization of the administrative machinery" and "put into the courts of law individuals of a reactionary type ... in order to control future abuses" (Wilson, 1956, p. 237).[13]

The circumstances of the crackdown further revealed the motives behind it. Since the reign of Akhenaten, the Hittites had risen and become a constant threat in the north (Wilson, 1956, p. 241; van Dijk, 2003, p. 270, 282–283, 287, 289), while military confrontations just before Horemheb's reign "failed to establish a new balance of power" (van Dijk, 2003, p. 282). The disastrous Egyptian defeat at Amqa (c. 1325 BC) still fresh (van Dijk, 2003, p. 283), Horemheb started his reign on the back foot, "preoccupied with the military situation in Egypt's northern territories" (van Dijk, 2003, p. 286, also 284–285; Wilson, 1956, p. 239). The internal situation did not help, either: "Akhenaten's reforms had left the country ... in ... an extremely negative ... state" (van Dijk, 2003, p. 282); from the end of Akhenaten's reign to the beginning of Horemheb's reign, Egpyt saw "chaos ... in the palace," "indecision,"

[13]For another example, see Wilson (1956, p. 241) on the anti-corruption campaign during the reign of Seti I (1290–1279 BC), the second pharaoh of the 19th Dynasty.

"dynastic confusion" (van Dijk, 2003, p. 282; Finer, 1997a, p. 179), and "the word of the king no longer had the same effectiveness in maintaining order" (Wilson, 1956, p. 242). What made things worse was that Horemheb "was of non-royal blood" and his "path to the throne had been beset with difficulties" with a few political enemies (van Dijk, 2003, p. 284–285). All these internal and external factors must have made Horemheb feel deeply about the rising risk of potential crises, which is the condition of Corollary 1.

As predicted by Corollary 1, the rising risk brought about the urgent need to "restore order and confidence within Egypt" through the anti-corruption campaign (Wilson, 1956, p. 236).[14] As Wilson (1956, p. 236, 242) comments, the "energetic measures" and "much harsher ... punishment than ... earlier enactments" were implemented because "Egypt had lost in security [and] self-confidence" and "had become nervously tense ... and exacting." The outcome of the campaign was also consistent with the prediction of Proposition 2 and Corollary 1: Horemheb's reign "appears to have been relatively uneventful" (van Dijk, 2003, p. 284), laying the foundation for what followed – when he died childless, the aged, non-royal prince regent succeeded as Rameses I and soon after his son succeeded as Seti I (van Dijk, 2003, p. 286), with which began the Ramesside period (19th–20th Dynasties), "a new era which would bring back Egypt's imperial glory" (Wilson, 1956, p. 240). Both Rameses I and Seti I "stepped into the kingship without undue trouble" (Wilson, 1956, p. 239), and "the Ramessid pharaohs considered Horemheb as the true founder of the dynasty" (van Dijk, 2003, p. 286).

Other examples. Besides the New Kingdom of Egypt, examples of historical states surviving despite pervasive corruption can be found in the history of the British Empire, India, Russia, and China (Shlapentokh, 2013; MacMullen, 2015, p. 11), consistent with Proposition 2.

Furthermore, several episodes in the history of Russia and the Soviet Union are particularly relevant to Corollary 1's prediction that additional risk of crisis can push the Center to crack down on corruption. In the Imperial era, when the Tsar was under pressure during the Russo–Japanese War, the state "drastically increased the punishment for bribing" (Shlapentokh, 2013, p. 151), consistent with Corollary 1. Under the Soviet rule, during Brezhnev's era, "irregularities," including corruption, "in the Central Asian republics [were] clearly widespread" so that they had "seriously eroded Moscow's ability to enforce directives" and created "de facto autonomy" (Critchlow, 1988, p. 143–144), consistent with Proposition 1. Not much was done about the problem under Brezhnev, but when Moscow faced increasing

[14] Given the state's dominance in the Egyptian economy (Finer, 1997a, p. 199), one may argue that the Center's status quo payoff was likely to be increasing in corruption in the case. This would further make the predicted impact of a lower $\underline{L}$ on R^* in Corollary 1 strictly negative.

economic, social, and demographic challenges in the post-Brezhnev era (Staples, 1993), Yuri Andropov started cracking down on corruption in the Central Asian republics as "a bid . . . to recapture maverick party and state organs in the republics from partial control" (Critchlow, 1988, p. 142), consistent with Corollary 1.[15] Consistent with Proposition 2 and Corollary 1, all these anti-corruption measures were able to bring stability, however temporarily, back to the state.

Other more recent examples can be found in the recurrent anti-corruption campaigns in the contemporary history of China. In a well-known speech shortly after the start of the most recent campaign since 2012, Xi Jinping asserted that "the gravest danger that challenges the Party comes from corruption within the Party," precisely because "when power seeks rents, people within the system hook up with people outside, group by vested interests, and challenge the leadership of the Party" (Xi, 2014). Since then he has pushed the narrative that "the major risks in the political, ideological, economic, scientific and technological, social, international-relation, and party-building realms" faced by the party was one of the primary motives behind the campaign (e.g., Xi, 2017; People's Daily, 2019). Taken at face value, the assertion and narrative are consistent with Proposition 1 and Corollary 1, respectively.[16] For earlier periods, Jiang and Xu (2015) recognize that between 1988 and 2014 "[a]nticorruption enforcement [was] tightened in years when there were significant economic/political events that have, or could have instigated considerable popular unrest." They also provide time-series evidence that higher intensity of anti-corruption enforcement was correlated with lower economic growth and higher inflation in the previous year, which they interpret as signs of greater social pressure and higher risk of political instability. All these observations are consistent with Corollary 1.[17]

4.3 Role of Fiscal Capacity

Although Proposition 2 implies that the state power should be fully shielded from the corrosive effect of corruption, in "a handful of examples in human history" corruption was "as consequential as in the case of the Roman Empire" (MacMullen, 2015, p. 10). As suggested by Proposition 3, one prominent reason for the Center to deviate from the lexicographic rule and over-tolerate corruption is the retention problem created by weak fiscal capacity. The

[15] In Brezhnev's Soviet Union, corruption "in many cases . . . [was] necessary for even the meagre levels of growth enjoyed by the state economy" (Clark, 1993, p. 278), making the comparative statics in Corollary 1 hold strictly.

[16] For more theoretical and empirical analyses on the motivations behind Xi's anti-corruption campaign, see for example Francois et al. (2016), Lu and Lorentzen (2018), Xi et al. (2018), and Li et al. (2019a).

[17] If we understand the Chinese economy as in Bai et al. (2014, 2020) and Li et al. (2019a) where corruption "greases the wheels," the comparative statics in Corollary 1 will again hold strictly.

mechanism was at work in the decline of the Ming dynasty in the Chinese history.

Ming China. During the 15th–17th centuries, as "more and more illegalities . . . came to be taken for granted, . . . gross corruption . . . became endemic [and] prevalent" among civil and military officials in the Ming dynasty (Finer, 1997b, p. 842, 847). The problem was so severe that when Grand Secretariat Zhang Juzheng tried to reform the administrative system in the 1570s, he "made himself a personal enemy of an entire empire" (Huang, 1981, p. 71). As a result, facing the Manchurian threat and domestic rebellions, the state "could not mobilize [its] resources . . . fast enough," and the Ming armies "were beaten . . . again and again" and "failed to crush" the enemies (Finer, 1997b, p. 845). The corrosive effect of corruption in Proposition 1 was not under the proper control that is implied by Proposition 2.

Consistent with Proposition 3, corruption in this period was connived at to solve the retention problem of the state. As Finer (1997b, p. 841) points out, a primary reason for the over-tolerance of corruption was that "mandarins were grossly underpaid." "[B]ecause emoluments for the bureaucracy authorized by the dynasty were fixed at very low levels" (Huang, 1981, p. 3), "[o]fficials made ends meet and tried to meet the debt" accumulated in the course of the civil service exam "by accepting extra payments which were outside the law" (Finer, 1997b, p. 842). On the instrumental role of corruption in solving the retention problem, Finer (1997b, p. 842) argues that "[n]ot to have [corruption over-tolerated] would have rocked the entire civil service, and the civil service was the government; . . . if the system worked poorly, without corruption it could not have worked at all."

Consistent with Proposition 3, again, the origin of the retention problem was the state's weak fiscal capacity at that time. Huang (1974) documents the difficulties in the fiscal arrangement in detail; Finer (1997b, p. 842) states that "the fiscal service [was] seriously flawed"; Finer (1997b, p. 844) further shows that the fiscal "difficulties were intensified by the dynasty's misunderstanding of currency." Eventually, the low taxation "led directly to the extra-legal and illegal fees and surtaxes merging into plain corruption" (Finer, 1997b, p. 842).

It is also noticeable that "the administration of the empire got by [and] 'satisficed'" because the Ming dynasty "was . . . very lucky" – "[f]or over 250 years they faced few foreign threats" (Finer, 1997b, p. 845, 853); once the Manchurian pressure mounted, it quickly "succumbed . . . between . . . its Manchu enemies [and] peasant and bandit revolts" (Finer, 1997b, p. 845). Therefore, the Ming state must have been in the realm of the too weak fiscal capacity in Proposition 3, where the Center would fail once a real crisis strikes. Not only that, according to Huang (2006, p. 76–78, 87, 144, 147), the Center was indeed aware of

the difficulties that the response to a real crisis would impose upon the "thoroughly decrepit army" and "the inelastic and cumbersome fiscal system" (Finer, 1997b, p. 853).

Despite this awareness, in general, "officials ... did not live on their regular pay" (Huang, 1981, p. 3), "the so-called pay and salaries were no more than pocket money for their recipients" (Huang, 1974, p. 275), and it was a "custom" that "central government officials relied for their living expenses on the 'gifts' of provincial officials" (Huang, 1981, p. 3; 1974, p. 276); "the tax burden ... was light and indeed on a number of occasions was actually reduced" (Finer, 1997b, p. 853); at the same time, "the economy was flourishing, particularly in the sixteenth century" (Finer, 1997b, p. 853). All these observations hint that the Center must have been managing the empire, including its personnel, corruption, taxation, and economy, in a way that the retention constraint and the likely loss of crisis control in any real crisis were of great concern only *overall,* not so much *at the margin.*

For this scenario, Corollary 2 predicts not only little political incentive but also little overall incentive for the Center to invest in fiscal capacity. This is consistent with the lack of initiative in the Ming state to improve its "seriously flawed" fiscal arrangement: it was "persisted in ... for well over 200 years" (Finer, 1997b, p. 842–843) and had "remained a strait-jacket until the mid-sixteenth century, after which some piecemeal alterations were made," but most parts "went without any substantial revision" (Finer, 1997b, p. 843). The censorial department "did indeed report on the maladministration in the fiscal services ... but ... the most that happened was the disgrace of an offending individual, not the reform of an ineffective institution" (Finer, 1997b, p. 848). The Ming state was thus trapped with its too weak fiscal capacity, eventually caught in "the financial crisis at the end of the dynasty which contributed so much to its downfall" (Finer, 1997b, p. 845).

Other examples. Supported by the data from Ch'ü (1962), Finer (1997c, p. 1157–1159) describes the same mechanism from weak fiscal capacity to over-tolerance of corruption through the retention problem during the decay of the Qing dynasty starting from the late 18th century, leading to the royal court's failure to respond to invasions and rebellions. Will (2004, p. 30–31) points out that this mechanism can date back to even the Song dynasty (960–1279). Beyond China, Finer (1997b, p. 736) documents that in the Mamluk Sultanate of Egypt, the "growth of bribery and corruption was to supplement the state revenue which had now become insufficient" to support the state, especially when the pressure from the Ottoman Empire was rising. In turn, basing himself on the account by Rycaut (1668), Finer (1997c, p. 1208) shows that the fiscal difficulty–corruption channel manifested itself again during the decline of the Ottoman Empire. All these declines of great empires are consistent with Proposition 3. Not only that, in all the cases, fiscal difficulties and pervasive corruption

"further enfeebled the kingship," i.e., weakened the control of the Center; this would start a "vicious circle" leading to even greater fiscal difficulties, more pervasive corruption, and eventually "worse ... dilapidation and dismemberment" of the state (Finer, 1997a, p. 209), consistent with Corollary 2 on the possible trap of weak fiscal capacity, rampant corruption, and the Center's loss of political control in any real crisis.

5 Conclusion

In this paper we focus on the corrosive effect of corruption on power within the state apparatus. We build a model to analyze its implications and the role of fiscal capacity in the Center's dealing with the erosion.

We demonstrate that when deciding how much corruption to tolerate at the lower level in the hierarchy, if the risk of crisis is fat-tailed, then the Center's concern about too much corruption threatening its control over the state apparatus during crises will dominate any other economic concerns. The Center should thus follow an endogenous lexicographic rule, choosing a corruption tolerance that will secure perfect control in crises first.

This lexicographic rule is, however, not always feasible, and weak fiscal capacity can be a major reason behind the over-tolerance of corruption. Created by too weak capacity, a total loss of control in any real crisis could in turn make the Center have little incentive at the margin to invest in fiscal capacity. Historical narratives from ancient to modern history are developed and consistent with all the theoretical results.

Our analysis displays a close relationship between the *economic* dimension of state capacity in *normal times,* for example, the state's ability to extract revenue from the population, reap rents from its affiliates, and properly pay these affiliates, and the *political* dimension of state capacity during *states of exception,* which requires absolute compliance of the state apparatus to respond to crises. Corruption is at the core of this relationship. We hope that our effort could open new avenues to understand the evolution of corruption and different dimensions of state capacity over time and across space.

Appendix

A Proof of Proposition 3

Proof. First, consider the case in which $0 < r < \underline{R}$. By the proof of Proposition 2, $R = \underline{R}$ dominates any $R \in (\underline{R}, \bar{R}]$ because the objective function is strictly decreasing in this range. By Assumption 3, $R = \underline{R}$, which would guarantee crisis control, dominates any $R \geq \bar{R}$,

which would induce a total loss of crisis control. Therefore, the Center will choose $R^* \in \arg\max_{R\in[r,\underline{R}]} \pi(R;\rho)$, so $S(R^*) = 1$.

Second, consider the case in which $r \in [\underline{R}, \bar{R})$. By the proof of Proposition 2, again, $R = r$ dominates any $R \in (r, \bar{R}]$ because the objective function is strictly decreasing in this range. The Center will then choose $R = r$ instead of any $R \geq \bar{R}$, if and only if $F(\rho r) \cdot D + \big(1 - F(\rho r)\big) \cdot \pi(r;\rho) \geq pD + (1-p) \cdot \sup_{R>\bar{R}} \pi(R;\rho)$.

Now examine this condition. Its right-hand side is a constant; the left-hand side is strictly decreasing for $r \in [\underline{R}, \bar{R})$, and it is equal to $\pi(\underline{R};\rho)$ at $r = \underline{R}$, and $pD + (1-p)\,\pi(\bar{R};\rho)$ at $r = \bar{R}$, respectively; also, by Assumption 3, we have $\pi(\underline{R};\rho) > pD + (1-p) \cdot \sup_{R>\bar{R}} \pi(R;\rho)$. Therefore, if $\pi(\bar{R};\rho) \geq \sup_{R>\bar{R}} \pi(R;\rho)$, the condition will hold for any $r \in [\underline{R}, \bar{R})$, and the Center will choose $R^* = r \in [\underline{R}, \bar{R})$, implying $S(R^*) = 1 - F(\rho r)$. If $\pi(\bar{R};\rho) < \sup_{R>\bar{R}} \pi(R;\rho)$, instead, then there exists a unique $\bar{r} \in (\underline{R}, \bar{R})$ such that $F(\rho\bar{r}) \cdot D + \big(1 - F(\rho\bar{r})\big) \cdot \pi(\bar{r};\rho) = pD + (1-p) \cdot \sup_{R>\bar{R}} \pi(R;\rho)$; the Center will thus choose $R^* = r$ and induce $S(R^*) = 1 - F(\rho r)$, if $r \in [\underline{R}, \bar{r}]$, and $R^* \in \arg\max_{R\geq\bar{R}} \pi(R;\rho)$ and induce $S(R^*) = 1 - p$, if $r \in (\bar{r}, \bar{R})$, respectively.

Finally, consider the case in which $r \geq \bar{R}$. When $R \geq r$, the objective function becomes $pD + (1-p)\,\pi(R;\rho)$. The Center will then choose $R^* \in \arg\max_{R\geq r} \pi(R;\rho)$. Since $r \geq \bar{R}$, $S^*(R) = 1 - p$.

The proposition then follows by collecting the three cases, regrouping the last two cases by $R^* = r$ and $R^* \in \arg\max_{R\geq\max\{r,\bar{R}\}} \pi(R;\rho)$, and recalling Lemma 2 that $r > 0$ uniquely solves $X(r) = x - w$ and Lemma 1 that $X(r)$ is strictly increasing. □

B Proof of Corollary 2

Proof. If $X(\underline{R}) \leq x - w < X(\bar{r})$, then $S(R^*) = S(r)$, where $S'(r) < 0$, and $V = S(r) \cdot \pi(r,\rho) + (1 - S(r)) \cdot D$. By Lemma 1, we have $X'(r) > 0$; by Lemma 2, we have $dr/d(w-x) = -1/X'(r) < 0$; by $\epsilon > \bar{\epsilon}$ and the proofs of Propositions 2 and 3, $dV/dr < 0$. Therefore, $dS(R^*)/d(w-x) = dS(r)/d(w-x) = S'(r) \cdot dr/d(w-x) > 0$ and $dV/d(w-x) = (dV/dr) \cdot (dr/d(w-x)) > 0$.

If $x - w \geq X(\bar{r})$ instead, then $S(R^*) = 1 - p$, so $dS(R^*)/d(w-x) = 0$. Also, in this case $V = (1-p) \cdot \max_{R\geq\max\{r,\bar{R}\}} \pi(R,\rho) + pD$. Therefore, if $R^* > r$, then V will not depend on r or $w - x$, i.e., $dV/d(w-x) = 0$. □

References

Aban, Inmaculada B., Mark M. Meerschaert, and Anna K. Panorska. 2006. Parameter estimation for the truncated Pareto distribution. *Journal of the American Statistical Association* **101**: 270–277.

Acemoğlu, Kamer Daron. 2005. Politics and economics in weak and strong states. *Journal of Monetary Economics* **52**: 1199–1226.

Acemoğlu, Kamer Daron, Camilo Garcia-Jimeno, and James A. Robinson. 2015. State capacity and economic development: A network approach. *American Economic Review* **105**: 2364–2409.

Acemoğlu, Kamer Daron, Davide Ticchi, and Andrea Vindigni. 2011. Emergence and persistence of inefficient states. *Journal of the European Economic Association* **9**: 177–208.

Acemoğlu, Kamer Daron, and Thierry Verdier. 1998. Property rights, corruption and the allocation of talent: A general equilibrium approach. *Economic Journal* **108**: 1381–1403.

Acemoğlu, Kamer Daron, and Thierry Verdier. 2000. The choice between market failures and corruption. *American Economic Review* **90**: 194–211.

Ackerman, Frank. 2017. *Worst-Case Economics: Extreme Events in Climate and Finance*. London: Anthem Press.

Agamben, Giorgio. 2003. *Stato di Eccezione*. Torino: Bollati Boringhieri.

Aghion, Philippe, Ufuk Akcigit, Julia Cagé, and William R. Kerr. 2016. Taxation, corruption, and growth. *European Economic Review* **86**: 24–51.

Aidt, Toke S. 2003. Economic analysis of corruption: A survey. *Economic Journal* **113**: F632–F652.

Aidt, Toke S. 2009. Corruption, institutions, and economic development. *Oxford Review of Economic Policy* **25**: 271–291.

Allen, Franklin, Jun Qian, and Lin Shen. 2018. Corruption and competition. Working paper, Center for Economic and Policy Research.

Ammianus, Marcellinus. c. 391. *Res Gestae*.

Anderson, Christopher J., and Yuliya V. Tverdova. 2003. Corruption, political allegiances, and attitudes toward government in contemporary democracies. *American Journal of Political Science* **47**: 91–109.

Bai, Chong-En, Chang-Tai Hsieh, and Zheng Michael Song. 2014. Crony capitalism with Chinese characteristics. Working paper, May 2014.

Bai, Chong-En, Chang-Tai Hsieh, and Zheng Michael Song. 2020. Special deals with Chinese characteristics. In Eichenbaum, Martin S., Erik Hurst, and Jonathan A. Parker (eds.) *NBER Macroeconomics Annual 2019*. Chicago: University of Chicago Press, 341–379.

Banfield, Edward C. 1967. *The Moral Basis of a Backward Society*. New York: Free Press.

Barbero, Alessandro. 2008. *The Day of the Barbarians: The Battle That Led to the Fall of the Roman Empire*. New York: Walker & Company. Translated by John Cullen from *9 Agosto 378: Il Giorno dei Barbari*. 2005. Roma: Giuseppe Laterza & Figli.

Bardhan, Pranab. 1997. Corruption and development: A review of issues. *Journal of Economic Literature* **35**: 1320–1346.

Barro, Robert J., and Tao Jin. 2011. On the size distribution of macroeconomic disasters. *Econometrica* **79**: 1567–1589.

Bertrand, Marianne, Simeon Djankov, Rema Hanna, and Sendhil Mullainathan. 2007. Obtaining a driver's license in India: An experimental approach to studying corruption. *Quarterly Journal of Economics* **122**: 1639–1676.

Besley, Timothy, and Torsten Persson. 2008. Wars and state capacity. *Journal of the European Economic Association* **6**: 522–530.

Besley, Timothy, and Torsten Persson. 2009. The origins of state capacity: Property rights, taxation, and politics. *American Economic Review* **99**: 1218–1244.

Besley, Timothy, and Torsten Persson. 2010. State capacity, conflict, and development. *Econometrica* **78**: 1–34.

Bremmer, Ian, and Preston Keat. 2009. *The Fat Tail: The Power of Political Knowledge in an Uncertain World*. New York: Oxford University Press.

Cai, Hongbin, Hanming Fang, and Lixin Colin Xu. 2011. Eat, drink, firms, government: An investigation of corruption from the entertainment and travel costs of Chinese firms. *Journal of Law and Economics* **54**: 55–78.

Chang, Eric C. C., and Yun-han Chu. 2006. Corruption and trust: Exceptionalism in Asian democracies? *Journal of Politics* **68**: 259–271.

Ch'ü, T'ung-tsu. 1962. *Local Government in China under the Ch'ing*. Cambridge: Harvard University Press.

Cingolani, Luciana. 2013. The state of state capacity: A review of concepts, evidence and measures. Working paper, United Nations University–Maastricht Economic and Social Research Institute on Innovation and Technology.

Clark, William A. 1993. Crime and punishment in Soviet officialdom, 1965–90. *Europe–Asia Studies* **45**: 259–279.

Colonnelli, Emanuele, and Mounu Prem. 2017. Corruption and firms: Evidence from randomized audits in Brazil. Working paper.

Cooke, Roger M., Daan Nieboer, and Jolanta Misiewicz. 2014. *Fat-Tailed Distributions: Data, Diagnostics and Dependence*. London: John Wiley & Sons, Inc.

Critchlow, James. 1988. 'Corruption', nationalism, and the native elites in Soviet Central Asia. *Journal of Communist Studies* **4**: 142–161.

Dal Bó, Ernesto, Frederico Finan, and Martín A. Rossi. 2013. Strengthening state capabilities: The role of financial incentives in the call to public service. *Quarterly Journal of Economics* **128**: 1169–1218.

Della Porta, Donatella. 2000. Social capital, beliefs in government, and political corruption. In Pharr, Susan J., and Robert D. Putnam (eds.) *Disaffected Democracies: What's Troubling the Trilateral Countries*. Princeton: Princeton University Press, 202–228.

Dincecco, Mark, and Mauricio Prado. 2012. Warfare, fiscal capacity, and performance. *Journal of Economic Growth* **17**: 171–203.

Downs, Anthony. 1957. An economic theory of political action in a democracy. *Journal of Political Economy* **65**: 135–150.

Egorov, Georgy, and Konstantin Sonin. 2011. Dictators and their viziers: Endogenizing the loyalty–competence trade-off. *Journal of the European Economic Association* **9**: 903–930.

Etzioni-Halevy, Eva. 1983. *Bureaucracy and Democracy: A Political Dilemma*. Boston: Routledge.

Ezrow, Natasha M., and Erica Frantz. 2013. *Failed States and Institutional Decay: Understanding Instability and Poverty in the Developing World*. New York: Bloomsbury.

Finer, Samuel Edward. 1997a. *The History of Government from the Earliest Times, Volume I: Ancient Monarchies and Empires*. New York: Oxford University Press.

Finer, Samuel Edward. 1997b. *The History of Government from the Earliest Times, Volume II: The Intermediate Ages*. New York: Oxford University Press.

Finer, Samuel Edward. 1997c. *The History of Government from the Earliest Times, Volume III: Empires, Monarchies, and the Modern State*. New York: Oxford University Press.

Fisman, Raymond, and Jakob Svensson. 2007. Are corruption and taxation really harmful to growth? Firm level evidence. *Journal of Development Economics* **83**: 63–75.

Francois, Patrick, Francesco Trebbi, and Kairong Xiao. 2016. Factions in nondemocracies: Theory and evidence from the Chinese Communist Party. National Bureau of Economic Research Working Paper No. 22775.

Fukuyama, Francis. 2011. *The Origins of Political Order: From Prehuman Times to the French Revolution*. New York: Farrar, Straus and Giroux.

Gennaioli, Nicola, and Hans-Joachim Voth. 2015. State capacity and military conflict. *Review of Economic Studies* **82**: 1409–1448.

Gibbon, Edward. 1781. *The History of the Decline and Fall of the Roman Empire: Volume the Second*. London: William Strahan and Thomas Cadell.

Gilley, Bruce. 2006. The determinants of state legitimacy: Results for 72 countries. *International Political Science Review* **27**: 47–71.

Guriev, Sergei. 2004. Red tape and corruption. *Journal of Development Economics* **73**: 489–504.

Guriev, Sergei, and Daniel Treisman. 2018. Informational autocrats. Working paper.

Heidenheimer, Arnold J., Michael Johnston, and Victor T. Le Vine (eds.). 1989. *Political Corruption: A Handbook*. New Brunswick: Transaction Publishers.

Hobbes, Thomas. 1651. *Leviathan or the Matter, Forme and Power of a Common-wealth Ecclesiasticall and Civil*. London: Andrew Crooke.

Huang, Ray. 1974. *Taxation and Governmental Finance in Sixteenth-Century Ming China*. Cambridge: Cambridge University Press.

Huang, Ray. 1981. *1587, a Year of No Significance: The Ming Dynasty in Decline*. New Haven: Yale University Press.

Huang, Ray. 2006. *1587, a Year of No Significance: The Ming Dynasty in Decline*. Beijing: Zhonghua Book Company, updated memorial edition.

Huntington, Samuel P. 1968. *Political Order in Changing Societies*. New Haven: Yale University Press.

Itzkowitz, Norman. 1972. *Ottoman Empire and Islamic Tradition*. Chicago: University of Chicago Press, Phoenix 1980 edition.

Jain, Arvind K. 2001. Corruption: A review. *Journal of Economic Surveys* **15**: 71–121.

Jiang, Junyan, and Yan Xu. 2015. Popularity and power: The political logic of anticorruption in authoritarian regimes. Working paper.

Jones, Arnold Hugh Martin. 1964. *The Later Roman Empire, 284–602: A Social Economic and Administrative Survey*. Oxford: Basil Blackwell.

Kreike, Emmanuel, and William Chester Jordan (eds.). 2004. *Corrupt Histories*. Rochester: University of Rochester Press.

Krueger, Anne O. 1974. The political economy of the rent-seeking society. *American Economic Review* **64**: 291–303.

Laffont, Jean-Jacques, and Jean Tirole. 1991. The politics of government decision-making: A theory of regulatory capture. *Quarterly Journal of Economics* **106**: 1089–1127.

Leff, Nathaniel H. 1964. Economic development through bureaucratic corruption. *American Behavioral Scientist* **8**: 8–14.

Li, Weijia, Gérard Roland, and Yang Xie. 2019a. Crony capitalism, the party-state, and political boundaries of corruption. Working paper, University of California, Riverside.

Li, Weijia, Gérard Roland, and Yang Xie. 2019b. Erosion of state power, corruption control, and political stability. Working paper, University of California, Riverside.

Lincoln, Abraham. 1953. Message to Congress in special session, July 4, 1861. In Basler, Roy P., Marion Dolores Pratt, and Lloyd A. Dunlap (eds.) *The Collected Works of Abraham Lincoln, Volume 4*. New Brunswick: Rutgers University Press, 422–441.

Lu, Xi, and Peter L. Lorentzen. 2018. Personal ties, meritocracy, and China's anti-corruption campaign. Working paper.

Lui, Francis T. 1985. An equilibrium queuing model of bribery. *Journal of Political Economy* **93**: 760–781.

Ma, Debin, and Jared Rubin. 2019. The paradox of power: Principal-agent problems and administrative capacity in Imperial China (and other absolutist regimes). *Journal of Comparative Economics* **47**: 277–294.

MacMullen, Ramsay. 1988. *Corruption and the Decline of Rome*. New Haven: Yale University Press.

MacMullen, Ramsay. 2015. *Corruption and the Decline of Rome*, chapter "Preface for the Chinese Translation". Beijing: China Fangzheng Press, 1–12. Translated by Houliang Lü from *Corruption and the Decline of Rome.* 1988. New Haven: Yale University Press.

Martindale, John Robert. 1980. *Prosopography of the Later Roman Empire: Volume II, A.D. 395–527*. London: Cambridge University Press.

Mauro, Paolo. 1995. Corruption and growth. *Quarterly Journal of Economics* **110**: 681–712.

Méndez, Fabio, and Facundo Sepúlveda. 2006. Corruption, growth and political regimes: Cross country evidence. *European Journal of Political Economy* **22**: 82–98.

Merton, Robert King. 1968. *Social Theory and Social Structure*. New York: Free Press.

Morris, Stephen D., and Joseph L. Klesner. 2010. Corruption and trust: Theoretical considerations and evidence from Mexico. *Comparative Political Studies* **43**: 1258–1285.

Muralidharan, Karthik, Paul Niehaus, and Sandip Sukhtankar. 2016. Building state capacity: Evidence from biometric smartcards in India. *American Economic Review* **106**: 2895–2929.

OED2. 1989. crisis, n. In Simpson, John Andrew, and Edmund S. C. Weiner (eds.) *The Oxford English Dictionary, Second Edition*. Oxford: Oxford University Press.

Olken, Benjamin A. 2006. Corruption and the costs of redistribution: Micro evidence from Indonesia. *Journal of Public Economics* **90**: 853–870.

Olken, Benjamin A., and Rohini Pande. 2012. Corruption in developing countries. *Annual Review of Economics* **4**: 479–509.

Padró i Miquel, Gerard, and Pierre Yared. 2012. The political economy of indirect control. *Quarterly Journal of Economics* **127**: 947–1015.

Pavarala, Vinod. 2004. Cultures of corruption and the corruption of culture: The East India Company and the Hastings impeachment. In Kreike, Emmanuel, and William Chester Jordan (eds.) *Corrupt Histories*. Rochester: University of Rochester Press, 291–336.

People's Daily. 2019. Strengthen the ability of prevention and control, focus on preventing and resolving major risks, and maintain sustained and healthy economic development and social stability. Pages 1–2, January 22, 2019.

Petry, Carl F. 1998. The military institution and innovation in the late Mamlūk period. In Petry, Carl F. (ed.) *The Cambridge History of Egypt, Volume I: Islamic Egypt, 640–1517*. Cambridge: Cambridge University Press, 462–489.

Pindyck, Robert S. 2011. Fat tails, thin tails, and climate change policy. *Review of Environmental Economics and Policy* **5**: 258–274.

Resnick, Sidney I. 2007. *Heavy-tail Phenomena: Probabilistic and Statistical Modeling*. New York: Springer.

Roemer, John E. 1985. Rationalizing revolutionary ideology. *Econometrica* **53**: 85–108.

Rose-Ackerman, Susan. 1978. *Corruption: A Study in Political Economy*. New York: Academic Press.

Rose-Ackerman, Susan. 1999. *Corruption and Government: Causes, Consequences, and Reform*. New York: Cambridge University Press.

Rose-Ackerman, Susan (ed.). 2007. *International Handbook on the Economics of Corruption*. Cheltenham: Edward Elgar.

Rose-Ackerman, Susan, and Bonnie J. Palifka. 2016. *Corruption and Government: Causes, Consequences, and Reform*. New York: Cambridge University Press, 2nd edition.

Rothstein, Bo. 2011. *The Quality of Government: Corruption, Social Trust, and Inequality in International Perspective*. Chicago: University of Chicago Press.

Rougé, Jean. 1966. L'histoire Auguste et l'Iaurie au IVe siècle. *Revue des Études Anciennes* **68**: 282–315.

Rubinstein, Ariel. 1982. Perfect equilibrium in a bargaining model. *Econometrica* **50**: 97–109.

Rycaut, Paul. 1668. *The Present State of the Ottoman Empire.* London: John Starkey and Henry Brome.

Schmitt, Carl. 1921. *Die Diktatur: Von den Anfängen des Modernen Souveränitätsgedankens bis zum Proletarischen Klassenkampf.* Leipzig: Duncker & Humblot.

Schmitt, Carl. 1922. *Politische Theologie: Vier Kapitel zur Lehre von der Souveränität.* Berlin: Duncker & Humblot.

Seligson, Mitchell A. 2002. The impact of corruption on regime legitimacy: A comparative study of four Latin American countries. *Journal of Politics* **64**: 408–433.

Shlapentokh, Vladimir Emmanuilovich. 2013. Corruption, the power of state and big business in Soviet and post-Soviet regimes. *Communist and Post-Communist Studies* **46**: 147–158.

Shleifer, Andrei, and Robert W. Vishny. 1993. Corruption. *Quarterly Journal of Economics* **108**: 599–617.

Staples, John. 1993. Soviet use of corruption purges as a control mechanism: The Uzbekistan case. *Past Imperfect* **2**: 29–48.

Svensson, Jakob. 2005. Eight questions about corruption. *Journal of Economic Perspectives* **19**: 19–42.

Svolik, Milan W. 2009. Power sharing and leadership dynamics in authoritarian regimes. *American Journal of Political Science* **53**: 477–494.

Taleb, Nassim Nicholas. 2007. *The Black Swan: The Impact of the Highly Improbable.* New York: Random House.

Tanzi, Vito. 1998. Corruption around the world: Causes, consequences, scope, and cures. *IMF Staff Papers* **45**: 559–594.

Tanzi, Vito, and Hamid Davoodi. 1998. Corruption, public investment, and growth. In Shibata, Hirofumi, and Toshihiro Ihori (eds.) *The Welfare State, Public Investment, and Growth: Selected Papers from the 53rd Congress of the International Institute of Public Finance*, chapter 4. Berlin: Springer-Verlag, 41–60.

Taylor, M. Scott. 2009. Environmental crises: Past, present, and future. *Canadian Journal of Economics* **42**: 1240–1275.

Tilly, Charles. 1990. *Coercion, Capital, and European States, AD 990–1990.* Cambridge: Basil Blackwell.

Tullock, Gordon. 1967. The welfare costs of tariffs, monopolies, and theft. *Economic Inquiry* **5**: 224–232.

van Dijk, Jacobus. 2003. The Amarna Period and the Later New Kingdom (*c.*1352–1069 BC). In Shaw, Ian (ed.) *The Oxford History of Ancient Egypt*, chapter 10. Oxford: Oxford University Press, 265–307.

Waterbury, John. 1973. Endemic and planned corruption in a monarchical regime. *World Politics* **25**: 533–555.

Waterbury, John. 1976. Corruption, political stability and development: Comparative evidence from Egypt and Morocco. *Government and Opposition* **11**: 426–445.

Wei, Shang-Jin. 1999. Corruption in economic development: Beneficial grease, minor annoyance, or major obstacle? World Bank Policy Research Working Paper No. 2048.

Weitzman, Martin L. 2009. On modeling and interpreting the economics of catastrophic climate change. *Review of Economics and Statistics* **91**: 1–19.

Weitzman, Martin L. 2011. Fat-tailed uncertainty in the economics of catastrophic climate change. *Review of Environmental Economics and Policy* **5**: 275–292.

Will, Pierre-Étienne. 2004. Officials and money in late imperial China: State finances, private expectations, and the problem of corruption in a changing environment. In Kreike, Emmanuel, and William Chester Jordan (eds.) *Corrupt Histories*. Rochester: University of Rochester Press, 29–82.

Wilson, John A. 1956. *The Culture of Ancient Egypt*. Chicago: University of Chicago Press.

Xi, Jinping. 2014. Speech in the Central Leading Group for Inspection Work's report to the Standing Committee of the Central Political Bureau of the Communist Party of China on the Central Inspection Groups' second-round inspections in 2014. October 16, 2014.

Xi, Jinping. 2017. Report to the 19th National Congress of the Communist Party of China by Xi Jinping on behalf of the 18th Central Committee of the Party. October 18, 2017.

Xi, Tianyang, Yang Yao, and Qian Zhang. 2018. Dilemmas of autocratic governance: Theory and evidence from the anti-corruption campaign in China. Working paper.

Zosimus. c. 518. *Historia Nova*.

Online Supplements to "Erosion of State Power, Corruption Control, and Fiscal Capacity"

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A Endogenous Enforcement of the Status Quo

We can extend Stage 3 of our model by introducing a second component in the Center's ability to enforce the status quo that is endogenous to corruption R. We model it as $sR \geq 0$, representing the rents that the local official will eventually lose after he defies the Center. This component can either be a punishment from the Center or some collateral damage.[1] The share $s \in [0, 1]$ is assumed exogenous, so sR is exogenous at Stage 3; since R is eventually determined by the Center at Stage 1, sR is eventually endogenous in the model. The total loss that the local official will bear in case of defiance is then $L + sR > 0$. The defiance condition for the official then becomes $w + (1 - \rho)R \leq w + (1 - s)R - L$, i.e., $L \leq (\rho - s)R \equiv \hat{L}(R)$.

Following this extension, all results from the model will hold, with ρ replaced by $\rho - s$, as long as we assume that the share of the rents that the local official will lose in case of his defiance and the ending of the status quo is relatively small, i.e., $s < \rho$. Our model in the main text is a special case in which $s \equiv 0$. If $s \geq \rho$ otherwise, given $R \geq 0$ and $L > 0$, the local official would never defy in any crisis, and corruption would then have no impact on the Center's crisis control at all – the model will become trivial.

We further provide two justifications for the assumption $s < \rho$. First, if we expect the Center to lose its political power when the status quo cannot be maintained, it would then

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[1] As suggested by one of the referees, s may be decreasing in the monitoring cost of the Center, which is in turn increasing in the geographical distance between the local official and the Center. It then follows that corruption in more distant localities can be more corrosive to the central authority. We thank the referee for the suggestion.

become extremely difficult for the Center to still be able to punish the local official at that time (e.g., Egorov and Sonin, 2011). This means that s can be small and even zero.

Second, given that our focus of corruption is on bribes and other exchanges of interests through relational building in the local official's jurisdiction, the local official's control over the rent generation process can be relatively independent of the status quo, and the Center can be especially weak to expropriate the rents in a crisis. The local official can then still keep most of the rents when the status quo ends, suggesting that s can be relatively small.

This second justification also links to two remarks on the interpretation of the corruption and rents in our model. First, it is applicable to a less extent to corruption such as embezzlement and diversion of public funds, because these rent-generation processes can be highly dependent on the status quo, and the ending of the status quo can destroy the source of the rents, suggesting a relatively high s.

Second, one might want to interpret R as the local tax revenue in a formal fiscal arrangement, but this interpretation is not applicable. Since the fiscal arrangement is formal, the Center would still have the legitimacy, if not more legitimacy, to exert sufficient control over local tax revenue during a crisis, so s can be high. This distinguishes our model of corruption tolerance from fiscal decentralization.[2]

B Unsecured Control under Thin-tailed Risk

Proposition S1. *Assume $x - w \leq 0$ and $\pi_R(R;\rho) > 0$ over $R \in [0, \underline{R}]$. If there exists $\underline{R}' \in (\underline{R}, \bar{R})$ such that, for any $L \in (\underline{L}, \rho\underline{R}')$,*

$$\epsilon < \underline{\epsilon} \equiv \min_{R \in [\underline{R}, \underline{R}']} \frac{\pi_R(R;\rho) \cdot R}{\pi(R;\rho) - D}, \tag{1}$$

then the Center's optimal choice $R^* \in [\underline{R}', \bar{R})$, which implies $R^* > \underline{R}$ and $S(R^*) < 1$.

Proof. By Assumptions 2 and 3, $R = \underline{R}$ dominates any $R \geq \bar{R}$. By $\pi_R(R;\rho) > 0$ over $R \in [0, \underline{R}]$, $R = \underline{R}$ dominates any $R \in [0, \underline{R})$. Therefore, $R = \underline{R}$ dominates any $R \in [0, \underline{R}) \cup [\bar{R}, \infty)$. As in the proof of Proposition 2, by $\epsilon < \underline{\epsilon}$ for any $L \in (\underline{L}, \rho\underline{R}')$, the Center's expected payoff is strictly increasing over $R \in [\underline{R}, \underline{R}']$. Then any $R \in [0, \underline{R}') \cup [\bar{R}, \infty)$ cannot be the optimal choice. The proposition then follows. □

[2] Another difference between our model and the literature on fiscal decentralization is that this literature often involves central–local information asymmetry and externality of local policies (e.g., Qian and Roland, 1998), which are not necessary for our result.

C Paradoxical Role of the Rent-sharing Arrangement

Now consider the impact of the rent-sharing arrangement ρ in the model. As discussed, a higher ρ proxies a more corrupt Center and a more dominant Center in the central–local relationship in the status quo. Its role in the Center's political–economic trade-off can be counterintuitive. On the one hand, although not modeled explicitly, the more dominant the Center is (higher ρ), the more rents it can reap from the local official (higher ρR), and the higher the status quo payoff of the Center. On the other hand, our analysis of Stage 3 shows that precisely because the Center can reap more rents from the local official (higher ρR), the local official has more vested interests to secure in a crisis. The local official is more likely to defy the Center and end the status quo (higher $F(\hat{L}(R))$ and lower $S(R)$), and the Center has to control local corruption more tightly to secure perfect control (lower $\underline{R}$). Therefore, this paradoxical role of ρ presents a fundamental conflict between crisis control and payoffs in normal times.

Since for any given range of the corruption tolerance, ρ could affect the tolerance that would maximizes the status quo payoff within the range, the impact of the rent-sharing arrangement on the Center's choice of the corruption tolerance is generally ambiguous. A clear-cut result can be derived, however, when we focus on the case where $\pi_R(R;\rho) > 0$, i.e. the Center's rent-seeking motive dominates or corruption "greases the wheels of the economy" so much that higher corruption raises the Center's status quo payoff. This is because under this condition, the Center will always tolerate corruption to the perfect-control limit:

Corollary S1. *Following Proposition 2, if $\pi_R(R;\rho) > 0$ over $R \in [0, \underline{R}]$ so that $R^* = \underline{R} = \underline{L}/\rho$, then R^* will strictly decrease with ρ.*

Given Corollary S1, what would the Center do, if it could choose not only R but also ρ? Here we provide a result when local corruption "greases the wheels" of the economy:

Corollary S2. *Following Proposition 2 and assuming $\pi(R;\rho) \equiv y(R) + \rho R$ over $R \in [0, \underline{R}]$ with $y'(R) > 0$, the Center's optimal choice of the rent-sharing arrangement is $\rho^* = \varrho > 0$, where ϱ is infinitesimal.*

Proof. First note that $\pi(R;\rho) \equiv y(R) + \rho R$ and $y'(R) > 0$ suggest $\pi_R(R;\rho) = y'(R) + \rho > 0$. Proposition 2 then suggests that, given $\rho > 0$, the optimal choice of $R^* = \underline{R} = \underline{L}/\rho$, securing control in crises. Given this choice, the Center is then maximizing $\pi(R^*;\rho) = y\left(\underline{L}/\rho\right) + \underline{L}$ by choosing $\rho \in (0,1)$. Given $y'(R) > 0$, the Center would then like to maximize $\underline{L}/\rho$. The result then follows. □

The intuition of Corollary S2 is as follows. If corruption "greases the wheels" of the economy, then the Center's status quo payoff will increase with corruption, which leads to

an optimal choice of corruption tolerance that is always just what is needed to secure crisis control. This corruption tolerance suggests that the rents that the Center can reap are limited to exactly $\underline{L}$, so that the Center maximizes its expected payoff as if it maximizes only the economic performance. To do that, the Center should choose a sharing scheme to tolerate corruption as much as possible. The Center then prefers to discipline itself and to decentralize corruption: this would allow more corruption at the local level, simultaneously maximizing the Center's status quo payoff and securing perfect control in case of a crisis.

D Personalistic Rule and Corruption

Corollaries 1 and S1 can shed light on the relationship between personalistic rule and corruption. In recent years the world has seen a rising trend of personalistic regimes (e.g., Kendall-Taylor et al., 2017; Geddes et al., 2018). The common view is that corruption is more severe in these regimes compared to other types of non-democratic regimes and in democracies (e.g., Chang and Golden, 2010); in Li et al. (2019), we confirm this view using cross-country panel-data that cover 134 countries over 1996–2010.

This correlation is apparently intuitive, since a personalistic ruler often finds it less constrained or more necessary to tolerate officials' corruption in exchange for their support (e.g., Bueno de Mesquita et al., 2003; Chang and Golden, 2010). This understanding ignores, however, a predominant feature of personalistic rule: personalistic rulers often place their personal associates, e.g., family members, close friends, and loyalists, in the state apparatus (e.g., Kendall-Taylor et al., 2017; Frantz et al., 2018; Geddes et al., 2018), and these officials who are personally tied to the ruler are usually especially corrupt. As pointed out by Frantz et al. (2018, p. 4), "[s]uch personnel choices ... link the fates of those in the ... apparatus with that of the leader." Considering this, if the primary purpose of tolerating corruption is to buy support, should not the ruler tolerate less, not more, corruption when the officials are personally tied or intrinsically more loyal to the ruler and, therefore, easier for the ruler to retain?

Corollaries 1 and S1 explain the complementarity between personalistic rule and corruption. When the local official is personally tied to the ruler, the Center has arguably more personal leverage and, therefore, a stronger ability to force the local official to comply, suggesting a greater $\underline{L}$. One can also interpret ρ as the net share of rents that the local official will gain by defying, and a local official who is personally tied to the ruler can be assumed to incur an additional loss of rents when the ruler loses power, suggesting a smaller ρ.[3] As seen above, a smaller ρ suggests that any given level of corruption R becomes less corrosive

[3]In Online Supplement A, this effect is explicitly modeled.

to the Center's control, since ρR becomes smaller; a greater $\underline{L}$ also suggests that, given any ρR, the critical threshold of these interests for the Center to just start losing control in crises becomes higher. Both effects imply that, while still covering the worst possible crisis, given a state-dominant economy or rent-seeking-dominant politics, the Center can now tolerate more corruption R^*. In other words, personalistic rule tolerates more corruption because corruption poses a lesser threat to personalistic rule.

E Endogenous Salary with Fiscal Capacity as a Budget

In the main text, the Center's fiscal capacity is measured by the gap between the exogenous salary w of the local official and her exogenous reservation payoff x. In this section, we endogenize the salary by defining fiscal capacity as a budget, subject to which the Center chooses the salary, while the rest of the budget will serve as an additional, conditional incentive to enforce the local official's compliance during the crisis.

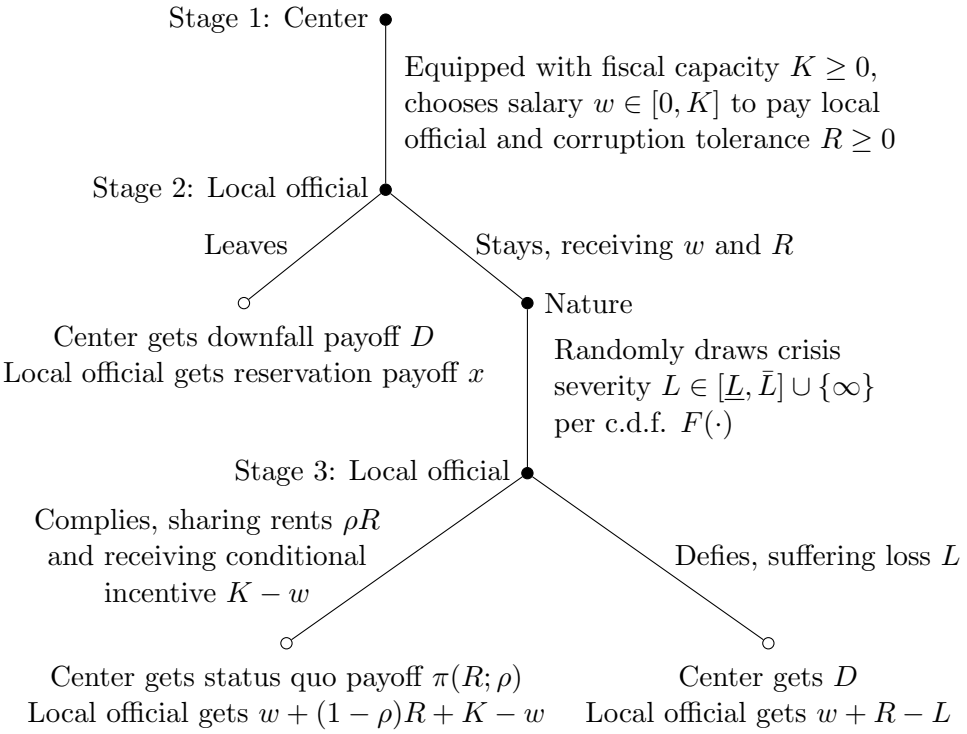

Figure 1: Endogenous salary with fiscal capacity as a budget

Figure 1 presents the setting: at Stage 1, before the crisis, the Center is equipped with a fiscal capacity $K \geq 0$ instead and chooses not only the corruption tolerance $R \geq 0$ but also the salary $w \in [0, K]$; nothing changes at Stage 2; at Stage 3, during the crisis, the local

official will receive $K - w$ in addition if and only if she complies. As we show below, analysis of the extension suggests that the results in the main text remain robust.

E.1 Stage 3

The local official will defy if and only if

$$w + (1 - \rho)R + K - w \leq w + R - L, \tag{2}$$

i.e.,

$$L \leq \rho R + w - K \equiv \hat{L}(R, w). \tag{3}$$

Now observe the critical threshold $\hat{L}(R, w)$. First, it is increasing in R, since a higher corruption tolerance increases the vested interest for the local official to secure during a crisis, as in the main text.

Second, different from the main text, the threshold is now also increasing in the salary w. This is because the more the Center pays the local official the salary w before the crisis i.e., unconditionally on her compliance during the crisis, the less of the fiscal capacity can serve as the conditional incentive $K - w$ to enforce her compliance during the crisis.

E.2 Stage 2

The local official will stay if and only if her expected payoff from staying covers the reservation payoff, i.e.,

$$\begin{aligned} x &\leq \mathbf{E}_L[w + \max\{(1 - \rho)R + K - w, w + R - L\}] \\ &= K + R - \mathbf{E}_L[\min\{\rho R, L - w + K\}] \equiv X(R, w), \end{aligned} \tag{4}$$

which we call the retention condition, where $X(R, w)$ denotes the local official's expected payoff for staying.

Now observe the expected payoff $X(R, w)$. First, it is still increasing in R, i.e., corruption helps retain the local official, as in the main text.

Second, a new feature emerges that $X(R, w)$ is also increasing in w, i.e., the local official is more willing to stay if more of her payoff is unconditional on her compliance during the crisis. This implies that the Center will face a trade-off when choosing the salary: a higher salary helps retain the local official but leaves less resources for enforcement of her compliance after the retention.

E.3 Stage 1

The Center's program is

$$\max_{R,\, w} \quad \big(1 - S(R,w)\big) \cdot D + S(R,w) \cdot \pi(R;\rho), \tag{5}$$

where

$$R \geq 0, \quad 0 \leq w \leq K, \quad S(R,w) = \mathbf{1}_{X(R,w)\geq x} \cdot \left(1 - F\left(\hat{L}(R,w)\right)\right), \tag{6}$$

in which

$$\hat{L}(R,w) = \rho R + w - K, \quad X(R,w) = K + R - \mathbf{E}_L[\min\{\rho R, L - w + K\}]. \tag{7}$$

To solve the program, we first consider the Center's choice of w while taking R as given:

Lemma S1. *Given the corruption tolerance R, the Center's optimal choice of the salary $w^*(R)$ follows:*

- *if $X(R,0) > x$, $w^*(R) = 0$;*
- *if $X(R,0) \leq x$ and $X(R,K) \geq x$, $w^*(R) \in [0,K]$ uniquely solves*

$$X(R, w^*(R)) = x; \tag{8}$$

- *if $X(R,K) < x$, $w^*(R)$ can be any $w \in [0,K]$.*

Proof. Under Assumption 2 in the main text and given the fact that $\pi(R;\rho)$ does not depend on w, the Center's program to choose w given R is reduced to

$$\max_{w} \quad S(R,w), \tag{9}$$

where

$$0 \leq w \leq K, \quad S(R,w) = \mathbf{1}_{X(R,w)\geq x} \cdot \left(1 - F\left(\hat{L}(R,w)\right)\right), \tag{10}$$

in which

$$\hat{L}(R,w) = \rho R + w - K, \quad X(R,w) = K + R - \mathbf{E}_L[\min\{\rho R, L - w + K\}]. \tag{11}$$

Since $\hat{L}(R,w)$ is strictly increasing in w, the solution follows. □

The intuition of Lemma S1 is as follows. Given the corruption tolerance R, the Center would like to first retain the local official $X(R,w) \geq x$; given she is retained, the Center

would like to make the salary as small as possible so that the conditional incentive to enforce compliance during the crisis can be as large as possible. Therefore, if a zero salary can already retain the local official ($X(R,0) > x$), then a zero salary will be given and all the fiscal capacity will be used for the conditional incentive; if some positive salary has to be paid to retain the local official, it will be paid at the level that would just suffice to retain but not more ($X(R, w^*(R)) = x$); if using up the fiscal capacity for salary cannot retain the local official (if $X(R,K) < x$), then the salary does not matter to the Center.

Given Lemma S1, the Center's program to choose R and w can be reduced to a choice of R, followed by the optimal choice of $w^*(R)$:

$$\max_R \quad \left(1 - S(R, w^*(R))\right) \cdot D + S\left(R, w^*(R)\right) \cdot \pi(R;\rho), \tag{12}$$

where

$$R \geq 0, \quad S\left(R, w^*(R)\right) \equiv \mathbf{1}_{X(R,w^*(R))\geq x} \cdot \left(1 - F\left(\hat{L}\left(R, w^*(R)\right)\right)\right), \tag{13}$$

in which

$$\begin{aligned} &\hat{L}(R, w^*(R)) \equiv \rho R + w^*(R) - K, \\ &X(R, w^*(R)) \equiv K + R - \mathbf{E}_L[\min\{\rho R, L - w^*(R) + K\}, \\ &\qquad w^*(R) \text{ as in Lemma S1.} \end{aligned} \tag{14}$$

By Assumptions 1 and 2 in the main text, the Center will prefer to retain the local official whenever it is feasible. This moves us to examine the property of $X(R, w^*(R))$ and, thus, the retention condition $X(R, w^*(R)) \geq x$:

Proposition S2. *The model with an endogenous salary has two scenarios:*

1. *when $K \geq x$, $X(R, w^*(R)) \geq x$ holds for any $R \geq 0$, i.e., the local official will always stay in the state apparatus at Stage 2 regardless of the Center's choice of $R \geq 0$;*

2. *when $K < x$, $X(R, w^*(R)) \geq x$ will hold, i.e., the local official will stay, if and only if $R \geq r_K$, where $r_K > 0$ uniquely solves*

$$X(r_K, K) = x \tag{15}$$

and is decreasing in K and increasing in x.

Proof. By Lemma S1, we have three cases:

- if $X(R,0) > x$, then $w^*(R) = 0$, so $X(R, w^*(R)) = X(R,0) > x$;

- if $X(R,0) \leq x$ and $X(R,K) \geq x$, then $X(R,w^*(R)) = x$;
- if $X(R,K) < x$, then $w^*(R) \in [0,K]$, so $X(R,0) \leq X(R,w^*(R)) \leq X(R,K) < x$.

Therefore, the retention condition $X(R,w^*(R)) \geq x$ is equivalent to

$$X(R,K) \equiv K + R - \mathbf{E}_L[\min\{\rho R, L\}] \geq x. \tag{16}$$

Note that $X(R,K)$ strictly and continuously increases from K to ∞ as R increases from 0 to ∞, and it is strictly increasing in K. The proposition then follows. □

We now analyze the two scenarios separately, as we do in the main text.

E.3.1 Scenario 1 (No Retention Problem)

In this scenario, the fiscal capacity is sufficiently strong ($K \geq x$). We first characterize $w^*(R)$ in this scenario:

Lemma S2. *If $K \geq x$, then for any $R \geq 0$, $w^*(R) = 0$.*

Proof. Consider the two cases:

- when $x < K$: for any $R \geq 0$,

$$X(R,0) = K + R - \mathbf{E}_L[\min\{\rho R, L + K\}] > x + (1-\rho)R \geq x, \tag{17}$$

  so $w^*(R) = 0$ by Lemma S1;

- when $x = K$: for any $R > 0$,

$$X(R,0) = K + R - \mathbf{E}_L[\min\{\rho R, L + K\}] \geq x + (1-\rho)R > x, \tag{18}$$

  so $w^*(R) = 0$, too; for $R = 0$, $X(0,0) = K = x$, i.e., $w = 0$ solves $X(0,w) = x$, which implies $w^*(0) = 0$ by Lemma S1.

The lemma is then proven. □

Lemma S2 suggests that in Scenario 1 the fiscal capacity is so strong ($K \geq x$) that the Center can always guarantee retention ($X(R,w^*(R)) \geq x$) by optimally reserving all the capacity for the conditional incentive ($w^*(R) = 0$). The Center's program is thus reduced to

$$\max_R \quad \big(1 - S(R,0)\big) \cdot D + S(R,0) \cdot \pi(R;\rho), \tag{19}$$

where

$$R \geq 0, S(R,0) = 1 - F\left(\hat{L}(R,0)\right), \tag{20}$$

in which

$$\hat{L}(R,0) = \rho R - K. \tag{21}$$

We can then derive a corresponding result to Proposition 2 in the main text, involving a similar fat-tailed condition for the crisis severity:

Proposition S3. *If $K \geq x$, and if, for any $L \in (\underline{L}, \bar{L})$,*

$$\frac{L \cdot f(L)}{1 - F(L)} \equiv \epsilon > \bar{\bar{\epsilon}} \equiv \max_{R \in [\underline{\underline{R}}, \bar{\bar{R}}]} \frac{\pi_R(R;\rho) \cdot R}{\pi(R;\rho) - D}, \tag{22}$$

where

$$\underline{\underline{R}} \equiv (\underline{L} + K)/\rho, \quad \bar{\bar{R}} \equiv (\bar{L} + K)/\rho, \tag{23}$$

then the Center's optimal choice $R^* \in \arg\max_{R \in [0, \underline{\underline{R}}]} \pi(R;\rho)$, which implies $R^* \leq \underline{\underline{R}}$ and $S(R^*) = 1$.

Proof. First note that, similar to Proposition 1 in the main text, $\hat{L}(R,0)$ and $S(R,0)$ satisfy:

- when $0 \leq R \leq \underline{\underline{R}} \equiv (\underline{L} + K)/\rho$, $\hat{L}(R,0) \leq \underline{L}$, so $S(R,0) = 1$;
- when $\underline{\underline{R}} \leq R \leq \bar{\bar{R}} \equiv (\bar{L} + K)/\rho$, $\hat{L}(R,0) \in [\underline{L}, \bar{L}]$, so $S(R,0) = 1 - F\left(\hat{L}(R,0)\right)$ continuously, strictly decreases from 1 to $1 - p$ as R increases from $\underline{\underline{R}}$ to $\bar{\bar{R}}$;
- when $\bar{\bar{R}} \leq R < \infty$, $\hat{L}(R,0) \geq \bar{L}$, so $S(R,0) = 1 - p$.

Second, by Assumptions 2 and 3 in the main text, the Center must prefer any $R \in [0, \underline{\underline{R}}]$ to any $R \in (\bar{\bar{R}}, \infty)$, because the former would secure perfect crisis control while the latter would make the Center lose any crisis control.

Third, the Center's expected payoff will be strictly decreasing over $R \in \left(\underline{\underline{R}}, \bar{\bar{R}}\right)$, if and only if the marginal gain from additional security brought by a slightly lower corruption tolerance dominates the marginal sacrifice in the status quo payoff, i.e.,

$$-\frac{dS(R,0)}{dR} \cdot \left(\pi(R;\rho) - D\right) > S(R,0) \cdot \pi_R(R;\rho). \tag{24}$$

By $S(R,0) = 1 - F(\hat{L}(R,0))$, $\hat{L}(R,0) = \rho R - K$, and Assumption 2 in the main text, this condition is equivalent to

$$\frac{f(\hat{L}(R,0)) \cdot \left(\hat{L}(R,0) + K\right)}{1 - F(\hat{L}(R,0))} > \frac{\pi_R(R;\rho) \cdot R}{\pi(R;\rho) - D}. \tag{25}$$

Note the left-hand side

$$\frac{f(\hat{L}(R,0)) \cdot \left(\hat{L}(R,0) + K\right)}{1 - F(\hat{L}(R,0))} \geq \frac{f(\hat{L}(R,0)) \cdot \hat{L}(R,0)}{1 - F(\hat{L}(R,0))} \equiv \epsilon, \tag{26}$$

while the right-hand side

$$\frac{\pi_R(R;\rho) \cdot R}{\pi(R;\rho) - D} \leq \max_{R \in [\underline{\underline{R}}, \bar{\bar{R}}]} \frac{\pi_R(R;\rho) \cdot R}{\pi(R;\rho) - D} \equiv \bar{\bar{\epsilon}}. \tag{27}$$

Therefore, the condition can be guaranteed by $\epsilon > \bar{\bar{\epsilon}}$.

Therefore, if $\epsilon > \bar{\bar{\epsilon}}$, the Center's optimal choice $R^* \in [0, \underline{\underline{R}}]$, and $S^*(R^*, w^*(R^*)) = 1$. The proposition then follows. □

Corollaries similar to Corollaries 1, S1, and S2 would then follow Proposition S3.

E.3.2 Scenario 2 (Weaker Fiscal Capacity)

In this scenario, the fiscal capacity is weaker ($K < x$) so that the retention problem can be solved if and only if $R \geq r_K$. As the Center will prefer to retain the local official as long as it is possible, which is indeed possible as the Center can always choose $R \geq r_K$, the Center's program is reduced to

$$\max_R \quad \left(1 - S(R, w^*(R))\right) \cdot D + S(R, w^*(R)) \cdot \pi(R;\rho), \tag{28}$$

where

$$R \geq r_K, \quad S(R, w^*(R)) \equiv 1 - F\left(\hat{L}(R, w^*(R))\right), \tag{29}$$

in which

$$\hat{L}(R, w^*(R)) \equiv \rho R + w^*(R) - K. \tag{30}$$

To solve the program, we first examine $w^*(R)$ over $R \geq r_K$:

Lemma S3. *If $K < x$, then $w^*(R)$ follows:*

- *if $R \geq r_0$, then $w^*(R) = 0$, which implies $\hat{L}(R, w^*(R)) = \rho R - K$, the same as in Scenario 1;*
- *if $r_K \leq R \leq r_0$, then $w^*(R) \in [0, K]$ uniquely solves $X(R, w^*(R)) = x$, which implies $\hat{L}(R, w^*(R)) \equiv \rho R + w^*(R) - K \in [\rho R - K, \rho R]$,*

where $r_0 > r_K$ uniquely solves

$$X(r_0, 0) = x \tag{31}$$

and is strictly decreasing in K and strictly increasing in x.

Proof. By Proposition S2, $R \geq r_K$ implies $X(R, K) \geq x$, which implies by Lemma S1,

- $w^*(R) = 0$ if $X(R, 0) > x$;
- $w^*(R)$ solves $X(R, w^*(R)) = x$, if $X(R, 0) \leq x$.

Note that $X(R, 0)$ continuously and strictly increases from $K < x$ to ∞ as R increases from 0 to infinity, so there exists $r_0 > 0$ uniquely solves $X(r_0, 0) = x$.

Now examine r_0. By Proposition S2, $X(r_K, K) = x$; also by the definition of $X(R, K)$, $X(R, K) \geq X(R, 0)$ and $X(R, 0)$ is strictly increasing in R; therefore, $r_0 > r_K$. By $X(R, 0)$ strictly increasing in R and K, r_0 is strictly decreasing in K and strictly increasing in x. The lemma is then proven. □

Lemma S3 suggests that the Center will need to pay the local official some positive salary for retention if and only if she has not chosen a too high corruption tolerance. This suggests that it is possible for a higher corruption tolerance to help the Center with crisis control, because it will save some fiscal capacity for the conditional incentive during the crisis. At the same time, we have known that a higher corruption tolerance increases the vested interest for the local official to secure during the crisis. We thus need to examine which effect would dominate:

Lemma S4. *The critical threshold of the crisis severity $\hat{L}(R, w^*(R))$ is strictly decreasing over $R \in [r_K, r_0]$, and, therefore, the Center's stability $S(R, w^*(R))$ is weakly increasing over $R \in [r_K, r_0]$.*

Proof. Over $R \in [r_K, r_0]$, the derivative of $\hat{L}(R, w^*(R))$ with respect to R is

$$\frac{d\hat{L}(R, w^*(R))}{dR} = \rho + \frac{dw^*(R)}{dR}. \tag{32}$$

Differentiating $X(R, w^*(R)) = x$, i.e.,

$$K + R - \mathbf{E}_L[\min\{\rho R, L - w^*(R) + K\}] = x, \tag{33}$$

we have

$$dR + F\left(\hat{L}(R, w^*(R))\right) \cdot dw^*(R) - \left(1 - F\left(\hat{L}(R, w^*(R))\right)\right) \rho \cdot dR = 0, \tag{34}$$

i.e.,

$$\frac{dw^*(R)}{dR} = -\frac{1-\left(1-F\left(\hat{L}(R,w^*(R))\right)\right)\rho}{F\left(\hat{L}(R,w^*(R))\right)}. \tag{35}$$

Therefore,

$$\frac{d\hat{L}(R,w^*(R))}{dR} = -\frac{1-\rho}{F\left(\hat{L}(R,w^*(R))\right)} < 0. \tag{36}$$

This implies

$$\begin{aligned}\frac{dS(R,w^*(R))}{dR} &= -f\left(\hat{L}(R,w^*(R))\right)\cdot\frac{d\hat{L}(R,w^*(R))}{dR}\\ &= \frac{(1-\rho)\cdot f\left(\hat{L}(R,w^*(R))\right)}{F\left(\hat{L}(R,w^*(R))\right)} \geq 0.\end{aligned} \tag{37}$$

The lemma is then proven. □

Lemma S4 suggests that it is possible for a higher corruption tolerance strengthens the Center's crisis control, but this happens only when the Center is relying on some positive salary to retain the local official. The intuition is as follows: given the salary w, an additional unit of corruption rents will raise the local official's vested interest to secure during any crisis by ρ, increasing the critical threshold $\hat{L}$ by ρ; it will also increase the local official's expected payoff from staying by $(1-\rho)\cdot\left(1-F(\hat{L})\right)+F(\hat{L}) = 1-\rho\left(1-F(\hat{L})\right)$, which means the salary needed for retention is decreased by $\left(1-\rho\left(1-F(\hat{L})\right)\right)/F(\hat{L})$, and this decrease will increase the conditional incentive for crisis control and, therefore, decrease the critical threshold $\hat{L}$ by the same amount. The total effect is then a decrease of $\left(1-\rho\left(1-F(\hat{L})\right)\right)/F(\hat{L})-\rho = (1-\rho)/F(\hat{L})$ in $\hat{L}$, which will translate into an increase of $(1-\rho)\,f(\hat{L})/F(\hat{L})$ or no increase in stability, depending on whether $\hat{L}\in[\underline{L},\bar{L}]$.

That said, this new feature will not change the fact that, if the crisis severity is sufficiently fat-tailed, then the concern of stability will dominate in the Center's choice. This is backed by the following result:

Lemma S5. *If $K<x$, and if, for any $L\in(\underline{L},\bar{L})$,*

$$\frac{L\cdot f(L)}{1-F(L)} \equiv \epsilon > \bar{\bar{\epsilon}}' \equiv \frac{\rho}{1-\rho}\cdot\max_{R\in[r_K,r_0]}\left\{0,-\frac{\pi_R(R;\rho)\cdot R}{\pi(R;\rho)-D}\right\}, \tag{38}$$

then the Center's objective function is strictly increasing over $R\in[r_K,r_0]$ that induces

$\hat{L}(R, w^*(R)) \in (\underline{L}, \bar{L})$.

Proof. For any $R \in [r_K, r_0]$ that induces $\hat{L}(R, w^*(R)) \in (\underline{L}, \bar{L})$, the Center's objective function is increasing in R if and only if

$$-\frac{dS(R, w^*(R))}{dR} \cdot \big(\pi(R;\rho) - D\big) < S(R, w^*(R)) \cdot \pi_R(R;\rho). \tag{39}$$

Note

$$S(R, w^*(R)) = 1 - F\left(\hat{L}(R, w^*(R))\right), \tag{40}$$

$$\frac{dS(R, w^*(R))}{dR} = \frac{(1-\rho) \cdot f\left(\hat{L}(R, w^*(R))\right)}{F\left(\hat{L}(R, w^*(R))\right)}, \tag{41}$$

and

$$\hat{L}(R, w^*(R)) = \rho R + w^*(R) - K, \tag{42}$$

so the condition is equivalent to

$$\frac{f\left(\hat{L}(R, w^*(R))\right) \cdot \hat{L}(R, w^*(R))}{1 - F\left(\hat{L}(R, w^*(R))\right)} > -\frac{\pi_R(R;\rho)}{\pi(R;\rho) - D} \cdot \frac{\big(\rho R + w^*(R) - K\big) \cdot F\left(\hat{L}(R, w^*(R))\right)}{1-\rho}. \tag{43}$$

Note left-hand side is ϵ; the right-hand side

$$\begin{aligned} &-\frac{\pi_R(R;\rho)}{\pi(R;\rho) - D} \cdot \frac{\big(\rho R + w^*(R) - K\big) \cdot F\left(\hat{L}(R, w^*(R))\right)}{1-\rho} \\ &\leq \frac{\rho}{1-\rho} \cdot \max_{R \in [r_K, r_0]} \left\{0, -\frac{\pi_R(R;\rho) \cdot R}{\pi(R;\rho) - D}\right\} \equiv \bar{\bar{\epsilon}}'. \end{aligned} \tag{44}$$

The proposition then follows. □

Lemma S5 implies that with the new feature, the Center's objective function and the stability still go in the same direction. This means that the lexicographical rule, which puts stability in front of the status quo payoff, still holds. We are now ready to present the solution to the Center's program, corresponding to Proposition 3 in the main text:

Proposition S4. *If $K < x$, and if for any $L \in (\underline{L}, \bar{L})$, $\epsilon > \bar{\bar{\epsilon}} \equiv \max\{\bar{\epsilon}, \bar{\epsilon}'\}$, then the Center's optimal choice R^* follows:*

- *when $\hat{L}(r_0, 0) \leq \underline{L}$, i.e., $r_0 \leq \underline{\underline{R}}$, $R^* \in \arg\max_{R \in [\underline{r}, \underline{\underline{R}}]} \pi(R;\rho)$, which implies $X(R^*, w^*(R^*)) \geq x$) and $S(R^*, w^*(R^*)) = 1$;*

- *when* $\underline{L} \leq \hat{L}(r_0, 0) \leq \bar{L}$*, i.e.,* $\underline{\underline{R}} \leq r_0 \leq \bar{\bar{r}}$*,* $R^* = r_0$*, which implies* $X(R^*, w^*(R^*)) \geq x$ *and* $S(R^*, w^*(R^*)) = S(r_0, 0)$*;*

- *when* $\hat{L}(r_0, 0) \geq \bar{L}$*, i.e.,* $r_0 \geq \bar{\bar{r}}$*,* $R^* \in \arg\max_{R \geq \bar{\bar{R}}'} \pi(R; \rho)$*, which implies* $X(R^*, w^*(R^*)) \geq x$ *and* $S(R^*, w^*(R^*)) = 1 - p$*,*

where,

- *if* $\hat{L}(r_K, K) \leq \underline{L}$*,* $\underline{\bar{r}} \equiv r_K$*; if otherwise,* $\underline{\bar{r}} \in [r_K, r_0]$ *uniquely solves*

$$\hat{L}(\underline{\bar{r}}, w^*(\underline{\bar{r}})) = \underline{L}; \tag{45}$$

- *if* $\pi(\bar{\bar{R}}; \rho) \geq \sup_{R \geq \bar{\bar{R}}} \{\pi(R; \rho)\}$*,* $\bar{\bar{r}} \equiv \bar{\bar{R}}$ *and* $\bar{\bar{R}}' \equiv r_K$*; if otherwise,* $\bar{\bar{r}} \in (\underline{\underline{R}}, \bar{\bar{R}})$ *uniquely solves*

$$\big(1 - S(\bar{\bar{r}}, 0)\big) \cdot D + S(\bar{\bar{r}}, 0) \cdot \pi(\bar{\bar{r}}; \rho) = pD + (1 - p) \cdot \sup_{R > \bar{\bar{R}}} \pi(R; \rho) \tag{46}$$

  and $\bar{\bar{R}}' \equiv \bar{\bar{R}}$*.*

Proof. First, note that by $\epsilon > \max\{\bar{\epsilon}, \bar{\epsilon}'\} \equiv \bar{\bar{\epsilon}}$, the Center's objective function is strictly increasing over $R \in [r_K, r_0]$ such that $\hat{L}(R, w^*(R)) \in [\underline{L}, \bar{L}]$, and is strictly decreasing over $R \geq r_0$ such that $\hat{L}(R, w^*(R)) \in [\underline{L}, \bar{L}]$.

We have now four thresholds of the corruption tolerance:

- r_K, at which the Center can just retain the local official, while optimally using all the fiscal capacity for the salary; the corresponding threshold for the crisis severity is $\hat{L}(r_K, K)$;

- $r_0 > r_K$, at which the Center can just retain the local official, while optimally not paying her any salary; the corresponding threshold for the crisis severity is $\hat{L}(r_0, 0) \leq \hat{L}(r_K, K)$;

  when $r_K \leq R \leq r_0$, the Center can retain the local official, while optimally paying her some salary;

- $\underline{\underline{R}} = (\underline{L} + K)/\rho$, at which the Center can just secure control in any real crises, while optimally not paying the local official any salary; the corresponding threshold for the crisis severity is $\underline{L}$

- $\bar{\bar{R}} = (\bar{L} + K)/\rho > \underline{\underline{R}}$, at which the Center cannot secure any control in any real crises, while optimally not paying the local official any salary; the corresponding threshold for the crisis severity is $\bar{L}$;

when $\underline{\underline{R}} \leq R \leq \bar{\bar{R}}$, the Center can secure control in some crises, while optimally not paying the local official any salary.

Given all these, the solution to the Center's program then depends on how $[\hat{L}(r_0, 0), \hat{L}(r_K, K)]$ and $[\underline{L}, \bar{L}]$ overlap with each other:

- $\hat{L}(r_0, 0) \leq \underline{L}$, i.e., $r_0 \leq \underline{\underline{R}}$:
  - $\hat{L}(r_0, 0) \leq \hat{L}(r_K, K) \leq \underline{L} \leq \bar{L}$: The Center will choose $R^* \in \arg\max_{R \in [r_K, \underline{\underline{R}}]} \pi(R; \rho)$, i.e., retaining the local official first, satisfied with always perfect crisis control second, and maximizing the status quo payoff finally. This implies $S^*(R^*, w^*(R^*)) = 1$.
  - $\hat{L}(r_0, 0) \leq \underline{L} \leq \hat{L}(r_K, K) \leq \bar{L}$ or $\hat{L}(r_0, 0) \leq \underline{L} \leq \bar{L} \leq \hat{L}(r_K, K)$: The Center will choose $R^* \in \arg\max_{R \in [r', \underline{\underline{R}}]} \pi(R; \rho)$, where $r' \in [r_K, r_0]$ uniquely solves $\hat{L}(r', w^*(r')) = \underline{L}$, i.e., retaining the local official first, securing perfect control second, and maximizing the status quo payoff finally. This implies $S^*(R^*, w^*(R^*)) = 1$.
- $\underline{L} \leq \hat{L}(r_0, 0) \leq \bar{L}$, i.e., $\underline{\underline{R}} \leq r_0 \leq \bar{\bar{R}}$:
  - $\underline{L} \leq \hat{L}(r_0, 0) \leq \hat{L}(r_K, K) \leq \bar{L}$ or $\underline{L} \leq \hat{L}(r_0, 0) \leq \bar{L} \leq \hat{L}(r_K, K)$: The Center will compare $R^* = r_0 \geq r_K$, i.e., $\pi(r_0; \rho) \cdot S(r_0, 0) + D \cdot \big(1 - S(r_0; 0)\big)$, versus the best outcome when losing all crisis control, i.e., $\max_{R \geq \bar{\bar{R}}} \big\{\pi(R; \rho)\big\} \cdot (1 - p) + D \cdot p$.
    - If $\pi(\bar{\bar{R}}; \rho) \geq \sup_{R \geq \bar{\bar{R}}} \big\{\pi(R; \rho)\big\}$, then $R^* = r_0$. This implies $S^*(R^*, w^*(R^*)) = S(r_0, 0)$.
    - If $\pi(\bar{\bar{R}}; \rho) < \sup_{R \geq \bar{\bar{R}}} \big\{\pi(R; \rho)\big\}$, then there exists a unique $\bar{\bar{r}} \in (\underline{\underline{R}}, \bar{\bar{R}})$ such that

$$\big(1 - S(\bar{\bar{r}}, 0)\big) \cdot D + S(\bar{\bar{r}}, 0) \cdot \pi(\bar{\bar{r}}; \rho) = pD + (1 - p) \cdot \sup_{R > \bar{\bar{R}}} \pi(R; \rho), \tag{47}$$

      and the Center will choose $R^* = r_0$ and induce $S^*(R^*, w^*(R^*)) = S(r_0, 0)$, if $r_0 \in [\underline{\underline{R}}, \bar{\bar{r}}]$, and will choose $R^* \in \arg\max_{R \geq \bar{\bar{R}}} \pi(R; \rho)$ and induce $S^*(R^*, w^*(R^*)) = 1 - p$, if $r_0 \in (\bar{\bar{r}}, \bar{\bar{R}})$, respectively.
- $\hat{L}(r_0, 0) \geq \bar{L}$, i.e., $r_0 \geq \bar{\bar{R}}$:
  - $\underline{L} \leq \bar{L} \leq \hat{L}(r_0, 0) \leq \hat{L}(r_K, K)$: The Center will choose $R^* \in \arg\max_{R \in [r_K, \infty)} \pi(R; \rho)$, i.e., retaining the local official first, having to give up crisis control second, and maximizing the status quo payoff finally. This implies $S^*(R^*, w^*(R^*)) = 1 - p$.

The proposition then follows us regrouping the cases by S^* and R^*. □

Note $\hat{L}(r_0, 0) = \rho r_0 - K$, while r_0 is decreasing in K by Lemma S3, so $\hat{L}(r_0, 0)$ is strictly decreasing in K. Thus, the three cases in Proposition S4 correspond to three cases along which the fiscal capacity K decreases. A corollary similar to Corollary 2 would then follow.

References

Bueno de Mesquita, Bruce, Alastair Smith, James D. Morrow, and Randolph M. Siverson. 2003. *The Logic of Political Survival*. Cambridge: MIT Press.

Chang, Eric C. C., and Miriam A. Golden. 2010. Sources of corruption in authoritarian regimes. *Social Science Quarterly* **91**: 1–20.

Egorov, Georgy, and Konstantin Sonin. 2011. Dictators and their viziers: Endogenizing the loyalty–competence trade-off. *Journal of the European Economic Association* **9**: 903–930.

Frantz, Erica, Andrea Kendall-Taylor, Joseph Wright, and Xu Xu. 2018. Personalization of power and repression in dictatorships. Working paper, Pennsylvania State University.

Geddes, Barbara, Joseph Wright, and Erica Frantz. 2018. *How Dictatorships Work: Power, Personalization, and Collapse*. New York: Cambridge University Press.

Kendall-Taylor, Andrea, Erica Frantz, and Joseph Wright. 2017. The global rise of personalized politics: It's not just dictators anymore. *The Washington Quarterly* **40**: 7–19.

Li, Weijia, Gérard Roland, and Yang Xie. 2019. Erosion of state power, corruption control, and political stability. Working paper, University of California, Riverside.

Qian, Yingyi, and Gérard Roland. 1998. Federalism and the soft budget constraint. *American Economic Review* **88**: 1143–1162.