Governing Local Bureaucracy in a Centralized State

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Abstract

We develop a model of dynamic moral hazard to study the local governance in a centralized state. In each period, a principal chooses a mode of governance, deciding whether to delegate local affairs to an agent with better expertise, whether to supervise the agent, or to take over local affairs; while the agent chooses whether to exert effort or slack in carefully managing local affairs. A trilemma arises as the principal cannot overcome the three inefficiencies at the same time: loss of local expertise, rent-seeking behavior, and slacking. The relationship eventually evolves into recurrent centralization, or recurrent unsupervised delegation, or perpetuated slacking. Albeit inefficient ex post, the equilibrium is consistent with ex ante optimal administration. The underpinning of these results is moral hazard in local agency and a centralized state's lack of commitment in how to govern its local affairs. Our theory sheds light on broader scenarios of agency problems in a centralized state.

1. Introduction

Successful states maintain successful local governance (Myerson, 2024). The reliance on local bureaucrats to govern is particularly salient for vast centralized states, empires for instance.[1] Such a reliance implies two distinct goals a centralized state seeks to achieve in administering its local politics, namely, leveraging local expertise and preventing local bureaucrats from abusing their power (Burbank and Cooper, 2021). Specifically, the inefficiency of centralization (Ostrom, 2008; Tullock, 1987) requires the state to delegate power to local bureaucrats, thus exploiting their expertise and maintaining local responsiveness (Grindle, 2009; Scott, 2020). Meanwhile, delegation also creates opportunities for local bureaucrats to abuse their power (Asthana, 2012; Zhou, 2022), leading to outcomes that the central government dreads—corruption, rebellion, and various other forms of insubordination (Burbank and Cooper, 2021; Finer, 1997) that we summarize as "rent-seeking."[2] Hence, it is also necessary for the central government to supervise the local bureaucrats, thereby deterring their rent-seeking behaviors.[3] Therefore, it is a conventional wisdom that supervised delegation should be the normal mode of local governance in a centralized state. The local bureaucrats should be delegated the power to manage local affairs and they should be supervised.

Despite this intuition, we often observe instances where central states deliberately diverge from supervised delegation. In the Roman Empire, after centuries of delegated governance in Egypt (Bureth, 1965; Capponi, 2005), the central state began to take a more interventionist stance, characterized by centralization attempts, in the third century (Adams, 2006, 2010; Jones, 1986). Historians have noted the varying center-provincial relations in Ottoman Empire, which was documented to experience alternating phases of centralization and devolution (Darwin, 2008). In the 17th and 18th centuries, the Court of Directors of the English East India Company granted its employees the rights to private trade that might erode its monopoly privileges (Erikson, 2014). In modern China, the past decades have witnessed the co-existence of inefficient centralizing and delegation that caused rampant rent-seeking (Landry, 2008; Zhou, 2016, 2022). Following these examples, a natural question arises: why and when would a centralized state adopt those seemingly

[1] Empires were featured by its internal heterogeneity (Burbank and Cooper, 2021; Finer, 1997) and famous empires, such as the Assyrian Empire (Finer, 1997), Roman Empire (Ando, 2018; Finer, 1997), and Ottoman Empire (Barkey, 2008; Darwin, 2008), all demonstrate a large extent of reliance on the cooperation of the network of local elites. They served as tax farmers, civil servants, and the maintainer of local order.

[2] Our general interpretation of rent-seeking and its microfoundation can be found in the model setup.

[3] The necessity of supervision becomes evident as a counterbalance to delegation (Grindle, 2009; Rose-Ackerman and Palifka, 2016). Empirical evidence shows that, by supervising local agents, the central government can reduce distortion and corruption (e.g., Buntaine and Daniels, 2020; Olken, 2007).

inefficient arrangements in local governance, deviating from the conventional wisdom of supervised delegation?

We argue that a centralized state has three instead of two goals in its local governance: what the conventional wisdom fails to take into account is the central government's need to motivate local bureaucrats to exert costly effort by properly using the delegated discretionary power.[4] This goal is beyond the exploitation of local expertise and the deterrence of malfeasance. As indicated by above examples, the desire to avoid slacking of the local bureaucrats may create tension against the other two purposes.[5] Can all the three goals of local governance obtain in a centralized state? If not, what distortions might arise? Moreover, what are the dynamics in the modes of governance that emerge from a centralized state's optimal administration of local agency?

To address these questions, we develop a model of dynamic moral hazard between a centralized state, the *principal*, and a local bureaucrat, the *agent*. In each period, the principal chooses a mode of governance that has two components. The first concerns whether to delegate local governance to the agent. Only under delegation, the agent enjoys the privilege of managing local affairs and his expertise as well as effort contribute to the governing performance. The second component is whether to supervise the delegated power. Supervision enables the principal to oversee the governing performance and deter the agent's rent-seeking behaviors. The combination of these two components generates three possible modes of governance: supervised delegation, unsupervised delegation, and centralization. Given the mode of governance the principal chooses, the agent privately chooses whether to exert effort. The governing performance is generated stochastically given the mode of governance and if local governance is delegated, the agent's effort.

Four action profiles are possible. The first has the principal choose supervised delegation and the agent exert effort. This action profile, referred to as the *good normal*, is the principal's favorite outcome that realizes all the three goals of local governance. In contrast, the *bad normal* is the action profile in which the principal chooses supervised delegation yet the agent slacks. In the third action profile, referred to as *centralizing*, the principal chooses centralization, so that the agent's expertise and effort become irrelevant. At last, under *relenting*, the principal chooses unsupervised delegation, acquiescing to the agent's rent-seeking behaviors, and the agent slacks. Note that the bad normal is the

[4] An alternative interpretation of this objective is spacial. That is, in areas where interests of the central and the local government do not align, the central government wants its preferred policy to be implemented by the local bureaucrats.

[5] For instance, in order to empower its employees, the English East India Company chose to use private trade allowance as the remuneration of exemplary service, failing to deter rent-seeking behaviors in oversea trade (Erikson, 2014).

principal's second-best outcome. Under centralizing, the agent is deprived of the privilege of managing local affairs, while the principal fails to incorporate local expertise. Both are worse off in comparison to the bad normal. Under relenting, the agent not only slacks, but also engages in rent-seeking behaviors. Relative to the bad normal, the agent gains at the principal's expense.

Our environment combines two core ingredients of the local governance in a centralized state. The first is the moral hazard of local bureaucrats. Because of the difficulty to monitor their effort, a centralized state can only incentivize local bureaucrats by making their current governing performance consequential for future modes of governance. In our model, the principal must rely on two costly tools to motivate the agent: to punish the agent by the threat of centralizing, depriving him of delegated power and privileges, or to reward the agent by the promise of withdrawing supervision, allowing him to benefit from rent-seeking behaviors. The second ingredient is the principal's lack of commitment. Because a centralized state always retains the ultimate authority to reallocate power and privileges in its local politics, it cannot commit to future modes of governance.[6] In our model, the principal cannot commit to implement any threatened punishment in the form of centralizing nor to honor any promised reward in the form of relenting. The lack of commitment restricts the extent of punishments and rewards, limiting the scope for incentive provision.

We first analyze two incentive regimes under which punishment or reward is self-enforcing and thus credible. Under *Recurrent Centralizing*, the principal periodically abolishes and re-establishes delegation, but always imposes supervision. Whenever local affairs are delegated, the agent exerts effort. The play, hence, cycles between the *good normal* and *centralizing*. Centralization serves as the punishment to incentivize the agent, who understands that disastrous governing performance leads to the deprivation of the privilege from managing local affairs. In turn, the prospect of returning to the *good normal* makes the principal willing to implement the threatened punishment of centralizing despite forgoing the agent's expertise. The second incentive regime is the mirror case, which we refer to as *Recurrent Relenting*. Under this regime, while the principal always retains delegation, she periodically withdraws and re-imposes supervision. Whenever supervision is imposed, the agent exerts effort. As a result, the players cycle between the *good normal* and *relenting*. The withdrawal of supervision serves as a reward to incentivize the agent by the allowance of rent-seeking behaviors following excellent governing performance. The prospect of returning to the *good normal*, in turn, induces the principal to honor her promised reward of relenting. When

[6]Intuitively, the central authority is superior in a centralized state and can change the mode of governance flexibly. For example, Burbank and Cooper (2021) conveyed that empires enjoyed the flexibility to redefine their allocations of power and privilege. Darwin (2008) indicates that the Ottoman Empire experienced alternating phases of centralization and delegation according to the will of the central ruler.

dynamic incentives are not provided, the two parties engage in the repeated play of the *bad normal*, which we refer to as *Perpetuated Slacking*, in which the agent permanently slacks under supervised delegation.

We then provide a full characterization of the optimal equilibrium that maximizes the principal's ex-ante expected payoff. Incentives are provided by linking the agent's current governing performance to future punishments or rewards, which require adjustments in future modes of governance and are thus costly to the principal. Consequently, the principal's commitment power fundamentally shapes the strength of these incentives. We first show that the importance of the agent's effort to governing performance plays a central role. When effort is sufficiently unimportant, no incentive can be credibly provided, and the relationship is trapped in *Perpetuated Slacking*. Otherwise, both punishment and reward emerge on the equilibrium path. Punishment is always in the form of centralizing, while reward could take the form of either relenting or slacking.

As long as incentives can be provided, the optimal equilibrium begins with the *good normal* and involves a *probationary phase* in the initial periods. During this phase, the players engage in the *good normal* and the principal attains all the three goals of local governance. However, punishment or reward occurs sooner or later. As disastrous governing performance accumulates during the probationary phase, the continuation payoffs the principal promises to the agent gradually declines until punishment is finally triggered. On the contrary, the accumulation of excellent governing performance eventually leads to reward.

Building on these results, we show that the importance of the agent's effort determines how punishment and reward are supported, and consequently, the long-run regimes stemming from the optimal equilibrium. When effort is extremely important, punishment and reward are supported by *Recurrent Centralizing* and *Recurrent Relenting*, respectively. Both regimes are absorbing, so that the optimal equilibrium entails path dependence and long-run divergence. Depending on the agent's performance record in the probationary phase, the relationship must evolve into either periodical abolishment and re-establishment of delegation or periodical withdrawal and re-imposition of supervision. Both long-run regimes feature permanent cycling, recurrently deviating from the conventional wisdom of supervised delegation. As the importance of effort declines, *Recurrent Relenting* can no longer be sustained. Although reward is still in the form of relenting, it can only be temporary. With certainty, the relationship evolves into *Recurrent Centralizing*.

If the agent's effort is only moderately important, the principal completely refrains from allowing the agent's rent-seeking behaviors. Instead, she rewards the agent by tolerating his slacking under supervision. Path dependence reappears. While accumulation of disastrous governing performance still leads to *Recurrent Centralizing*, the relationship

finally settles into *Perpetuated Slacking* when excellent governing performance accumulates. Further decline in the importance of bureaucratic effort renders the principal unable to credibly provide any incentive in the long run. Even punishment—in the form of centralizing—is now at most temporary. The relationship is inevitably trapped into *Perpetuated Slacking* over time. An immediate implication is that the conventional wisdom of supervised delegation holds only when bureaucratic effort matters little in determining governing performance.

Our main result, therefore, is that in the long run, the relationship between the principal and the agent must evolve into one among *Perpetuated Slacking*, *Recurrent Centralizing*, or *Recurrent Relenting*. A *trilemma* of local governance consequently arises: the three goals of local governance including motivating bureaucratic effort, exploiting local expertise, and deterring rent-seeking behaviors cannot obtain simultaneously in the long run. This trilemma emerges from the optimal equilibrium under two contracting frictions—the agent's moral hazard and the principal's lack of commitment. On the one hand, to sustain the *good normal* in the early stages, the principal provides incentives via promising punishment and reward in the future. Past promises become accumulating debts the principal owes to the agent. While postponed as much as possible, these debts must be paid, and the relationship must enter into one absorbing punishment or reward regime in the long run. On the other hand, the principal's lack of commitment shapes how punishment and reward are supported. Relational incentives can only be made credible by the prospect of *Perpetuated Slacking* or the prospect of a self-enforcing recurrent regimes—*Recurrent Centralizing* or *Recurrent Relenting*. Our results, hence, provide insights into the inherent difficulties of local governance centralized states must face in a wide range of contexts.

2. Related Literature

Our paper is closely related to the literature of dynamic moral hazard in a political economy setting (for example, Schwarz and Sonin, 2007; Acemoglu et al., 2008; Yared, 2010; Aghion and Jackson, 2016; Acharya et al., 2024; Halac and Yared, 2024). A key insight from this literature is that absent efficient monetary transfer, some form of ex-post inefficiency, either the use of socially costly punishments or concession of rents from surplus, may be necessary for the principal to incentivize the agent ex ante. Moreover, both forms of costly incentive provision should be backloaded over time (Ray, 2002). Most closely related are Padró i Miquel and Yared (2012) and Myerson (2015). Similar to ours, Padró i Miquel and Yared (2012) study a model of dynamic moral hazard with limited commitment and apply the machinery of Abreu et al. (1990) to characterize equilibrium play. In each period, the

principal chooses whether to intervene with some intensity of force, which destroys the surplus and is therefore socially costly. In the optimal equilibrium, the relationship between the principal and the agent eventually settles into permanent cycling of intervention and non-intervention. This long-run implication bears resemblance to the recurrent centralizing in our model, with both intervention and centralizing serving as socially costly punishments. The key difference between our model and theirs rests in the principal's ability to credibly reward her agent in the long run. With intervention being the only tool that can be utilized to create incentives, rewards are temporary in Padró i Miquel and Yared (2012) and the relationship is certain to enter the punishment regime in the long run. In contrast, by considering a richer environment in which the principal can additionally cede the agent rents through relenting, we allow for self-enforcing reward regimes in the long run–either recurrent relenting or perpetuated slacking. This ability to reward in the long run leads to substantively different economic predictions. While both exhibit a similar two-phase structure, the optimal equilibrium of our model generates path dependence and divergent long-run outcomes despite the principal's concern with credibility. Depending on structural properties and early random events, the relationship between the two parties in our model evolves into one of the three absorbing regimes–recurrent relenting, recurrent centralizing, and perpetuated slacking. This is in stark contrast to Padró i Miquel and Yared (2012), where periodic intervention is a necessary feature in the long run. Myerson (2015) studies a model of continuous-time dynamic moral hazard and interprets the backloading of rent payments as the rise of aristocracy. The long-run reward regimes in our model, either recurrent relenting or perpetuated slacking, resembles this interpretation of aristocracy. In either case, the agent forever reserves the power and privileges of governing local politics. However, Myerson (2015) assumes that the principal can credibly follow a intertemporal dismissal rule as punishment for misbehavior, whereas our principal can commit to neither rewards nor punishments, so that both must be self-enforcing.

Theoretically, our results are connected to the literature that studies dynamic principal-agent problems with limited transfer and focuses on how the future of a relationship could be distorted to provide incentives today. Closely related are Guo and Hörner (2018) and Li et al. (2017), both of which study the optimal contracts in a setting where the principal has effective commitment power but cannot use monetary transfer to elicit the agent's private information. The optimal equilibrium in each of these two models entails path dependence and divergent long-run outcomes, with the relationship converging to one of two absorbing regimes: one featuring permanent immiseration and the other featuring entrenchment with the agent receiving his favorite outcomes permanently. Unlike these papers, our model generates path dependence and long-run polarization in the absence of the principal's commitment power.

Moreover, our principal, unable to commit to future modes of governance, can only backload costly incentive to a limited extent. As a result, two of the three possible long-run regimes—recurrent relenting and recurrent centralizing—necessarily feature permanent cycling, ceasing to be stationary as in Guo and Hörner (2018) and Li et al. (2017).

More broadly, our paper connects to the literature of relational contract (Bull, 1987; MacLeod and Malcomson, 1989; Baker et al., 1994; Levin, 2003). A body of work has explored dynamics in relational contract that arise, for instances, from limited liability or asymmetric information (e.g., Halac, 2012; Li and Matouschek, 2013). We focus on implications of dynamic moral hazard with limited commitment, as Lipnowski and Ramos (2020) do in a delegation setting and Fong and Li (2017) in an employment setting. Focusing on distinct relationships, nevertheless, their results feature different dynamics and long-run implications. In Lipnowski and Ramos (2020), the principal cannot credibly reward the agent in the long run, so that the relationship between the principal and the agent eventually dries out, in contrast to polarization as in our model. With the principal of Fong and Li (2017) able to use more flexible monetary compensation, the relationship eventually either terminates or stays in the reward regime featuring indefinite high effort, whereas in our model, the relationship never ends, and our agent slacks either permanently or recurrently on the equilibrium path in the long run.

Our paper contributes to understanding limits of local governance in a centralized state. In a static moral hazard model, Myerson (2021) studies local agency costs associated with political centralization, highlighting the necessity of decentralized power that local residents can exert to punish malfeasant officials. By investigating a setting where the central state and local bureaucracy interact over time, we show how moral hazard in local agency and limited commitment for a centralized state jointly lead to a trilemma of local governance: in any self-enforcing institutions of local governance in the long run, the central state cannot manage, at the same time, to motivate bureaucratic effort, to exploit local expertise, and to deter rent-seeking behaviors.

3. Model setup

The players are a *principal* (she) and an *agent* (he) interacting at $t = 0, 1, ...$ The principal is the leader of a centralized state, while the agent is a local bureaucrat residing in a region and has expertise in governing it. The principal cares about the *governing performance* of the region, represented by $y_t \in \mathbb{R}$, which is endogenously determined in the interaction between the principal and the agent.

At each t, the principal chooses a *mode of governance*, $m_t = (c_t, s_t)$, where $c_t \in \{0, 1\}$

represents whether governance of the region is *centralized* and $s_t \in \{0,1\}$ represents whether it is *supervised*. If governance of the region is centralized, it is necessarily supervised, $c_t = 1$ implies $s_t = 1$. By choosing not to centralize, $c_t = 0$, the principal delegates local affairs to the agent. In this case, the principal also chooses whether to supervise the agent, s_t. Hence, the set of all possible modes of governance is

$$\mathcal{M} := \{(1,1),(0,1),(0,0)\},$$

where $(1,1)$ is referred to as *centralization*, $(0,1)$ as *supervised delegation*, and $(0,0)$ as *unsupervised delegation*. Given the mode of governance $m_t \in \mathcal{M}$, the agent chooses whether to exert *effort* in managing local affairs, $e_t \in \{0,1\}$.

Delegation allows the principal to exploit the agent's expertise and potentially his effort, while supervision helps the principal deter the agent's rent-seeking behaviors.[7] As a result of the mode of governance the principal chooses and the agent's effort, the governing performance of the region at t is

$$y_t = (1 - c_t)(\theta + e_t\beta - (1 - s_t)r) + \epsilon_t,$$

where $\theta > 0$ measures the contribution of the agent's expertise, $\beta > 0$ measures the contribution of the agent's effort, $r > 0$ is what the agent gains from rent-seeking behaviors at the principal's expense when unsupervised, and $\epsilon_t \in \mathbb{R}$ is a stochastic shock that summarizes all the other factors that might affect governing performance. For convenience, assume that ϵ_t is identically and independently drawn from a distribution $F : \mathbb{R} \to [0,1]$ that has full support, a log-concave density f, and a mean normalized to 0.

The principal's flow payoff at t is y_t. The agent's flow payoff is

$$x_t = (1 - c_t)(w + (1 - s_t)r) - e_t,$$

where $w > 0$ is his gain from the privilege of managing local affairs and if unsupervised, the agent gains additionally r from rent-seeking behaviors. The cost of effort is normalized to 1.

The agent knows his effort e_t and, residing in the region, he always observes the governing performance y_t. The principal is unable to directly monitor the agent's effort e_t. However, as long as governance of the region is supervised $s_t = 1$, the principal is able to observe the governing performance y_t. At the beginning of t, a public signal $z_t \in [0,1]$ is drawn from the

[7] The intuition here is that the lack of supervision marginally leads to more rent-seeking behaviors. For instances, captains of the East India Company engaged in more smuggling activities when regulatory oversight was weak (Erikson, 2014) and Monson (2012, 191) mentioned corruption regarding harvest tax occurred due to the inability of monitoring.

uniform distribution independently across periods, allowing the principal and the agent to coordinate.

To summarize, the timing of the stage game at each t is as follows.

1. *The public signal z_t is drawn and publicly observed.*
2. *The principal chooses a mode of governance $m_t = (c_t, s_t) \in \mathcal{M}$.*
3. *The agent observes m_t and chooses effort $e_t \in \{0, 1\}$.*
4. *The governing performance y_t is drawn given (m_t, e_t).*
5. *The agent observes y_t and the principal observes $s_t y_t$.*

Both players are forward-looking and share a common discount factor $\delta \in (0, 1)$. The solution concept is *perfect public equilibrium* (equilibrium). Specifically, strategies condition only on the public history: $h_0 = z_0$ and for each $t \geq 1$,

$$h_t = (h_{t-1}, m_{t-1}, s_{t-1}y_{t-1}, z_t)\,.$$

The set of all possible histories at t is denoted as $\mathcal{H}_t$ and $\mathcal{H} := \bigcup_{t=0}^{\infty} \mathcal{H}_t$. A strategy of the principal $\sigma^P : \mathcal{H} \to \mathcal{M}$ maps each history h_t to a mode of governance $m_t = \sigma^P(h_t)$ the principal chooses at t. A strategy of the agent $\sigma^A : \mathcal{H} \times \mathcal{M} \to \{0, 1\}$ maps each history h_t and the mode of governance the principal chooses at t, m_t, to a level of effort $e_t = \sigma^A(h_t, m_t)$ the agent chooses at t. A strategy profile $\sigma = (\sigma^P, \sigma^A)$ induces the action profile

$$\sigma(h_t) := \left(\sigma^P(h_t), \sigma^A\left(h_t, \sigma^P(h_t)\right)\right) \in \mathcal{M} \times \{0, 1\}$$

for each history $h_t \in \mathcal{H}$. The principal's expected payoff under strategy profile σ is

$$V(\sigma) := (1 - \delta)E\left(\sum_{t=0}^{\infty} \delta^t y_t \mid \sigma\right)$$

and that of the agent is

$$U(\sigma) := (1 - \delta)E\left(\sum_{t=0}^{\infty} \delta^t x_t \mid \sigma\right).$$

An equilibrium is a strategy profile σ such that for each $h_t \in \mathcal{H}$, $\sigma^P|_{h_t}$ maximizes the principal's expected payoff given $\sigma^A|_{h_t}$, while $\sigma^A|_{h_t}$ maximizes the agent's expected payoff given $\sigma^P|_{h_t}$. The set of all possible equilibria is denoted as $\mathcal{E}$. The *optimal* equilibrium σ^*

maximizes the principal's expected payoff at $t = 0$, that is, $V(\sigma^*) = \sup_{\sigma \in \mathcal{E}} V(\sigma)$. In what follows, the subscript "t" is omitted whenever it causes no confusion.

Our analysis proceeds as follows. In Section 4, we define four possible action profiles and clarifies the problems of incentive and commitment facing the principal. Section 5 defines and analyzes two incentive regimes under which punishments and rewards are self-enforcing and occur recurrently on their equilibrium paths. Section 6 characterizes the optimal equilibrium, culminating in Corollary 1 that identifies a trilemma of local governance in centralized states. In Section 7, we connect our theoretical results to historical cases.

4. Incentive and commitment problems

The agent's effort is inconsequential to the future play unless the principal delegates local governance and chooses to supervise the agent, $m = (0, 1)$. If the principal centralizes, $m = (1, 1)$, the governing performance is independent to the agent's effort. If the principal opts for unsupervised delegation, $m = (0, 0)$, the agent's effort could affect the governing performance, but because the principal cannot observe y, it is inconsequential to the future play. In both cases, the agent only burdens the cost of exerting effort, so that he always chooses $e = 0$. Therefore, in any equilibrium $\sigma \in \mathcal{E}$,

$$\sigma^A(h, (1, 1)) = \sigma^A(h, (0, 0)) = 0$$

must hold for all $h \in \mathcal{H}$.

Lemma 1. *For any $\sigma \in \mathcal{E}$ and $h \in \mathcal{H}$,*

$$\sigma(h) \in \{G, B, R, C\},$$

where

$$G := ((0, 1), 1), \; B := ((0, 1), 0), \; C := ((1, 1), 0), \; R := ((0, 0), 0).$$

Among the four possible action profiles, G, referred to as the *good normal*, is first-best for the principal. Under G, the principal gets the largest possible expected payoff

$$E(y|G) = \theta + \beta$$

in the state game. She benefits from both the agent's expertise and effort, while avoiding suffering from his rent-seeking behaviors. This action profile requires the principal to refrain

from centralizing, $c = 0$, so as to exploit the agent's expertise in managing local affairs. At the same time, it requires the principal to supervise the agent, $s = 1$, so as to deter his rent-seeking behaviors. Note that the agent does not care about governing performance per se. Hence, if the principal always chooses supervised delegation, $m = (0, 1)$, the agent would lack incentive to exert effort and thus choose $e = 0$. The resulted action profile, B, is referred to as the *bad normal*.

Although the principal cannot benefit from the agent's effort under B, it still is the principal's second-best, providing her with the second largest expected payoff

$$E(y|B) = \theta$$

in the stage game. The agent slacks under all the three action profiles other than G. But under B, the principal can at least exploit the agent's expertise and deter his rent-seeking behaviors. In fact, B is the unique stage-game equilibrium: given that there is no future, the agent always chooses $e = 0$; and given that the principal cannot benefit from the agent's effort anyway, she prefers $m = (0, 1)$. As a result, always playing B constitutes an equilibrium in the repeated game.

Definition 1. The equilibrium of *perpetuated slacking* $\sigma_B \in \mathcal{E}$ is such that $\sigma_B(h) = B$ for all $h \in \mathcal{H}$.

Clearly, the equilibrium of perpetuated slacking yields the payoffs

$$U(\sigma_B) = w$$
$$V(\sigma_B) = \theta$$

to the agent and the principal, respectively. If the principal keeps delegating local governance and supervising the agent, she cannot motivate the agent to exert effort in managing local affairs. This is the problem of incentive in local governance.

To incentivize the agent, the principal must make his effort consequential for his future payoff. There are two possible ways corresponding to the last two action profiles R and C. On the one hand, the principal can threaten the agent that if he manages the local affairs badly, generating a disastrous governing performance, she would *punish* him by withdrawing delegation, $c = 1$, which results to the action profile of C, referred to as *centralizing*. Namely, the principal centralizes governance of the region, depriving the agent of the privilege of managing local affairs and his gain w from it. The risk of losing the privilege of managing local affairs in the future pressures the agent to exert effort today, so as to avoid generating a disastrous governing performance.

On the other hand, the principal can promise to the agent that if he manages the local affairs well, generating an excellent governing performance, she would *reward* him by withdrawing supervision, $s = 0$, which results to the action profile of R, referred to as *relenting*. Namely, the agent is relented: he has the principal's acquiescence to engage in rent-seeking behaviors, receiving the benefit of r in addition to his gain from the privilege of managing local affairs. The potential gain from rent-seeking in the future courages the agent to exert effort today, so as to generate an excellent governing performance.

The principal, however, has a commitment problem in providing these incentives. As the leader of a centralized state, the principal faces no constraint in choosing how to govern any particular region at any time. Because her expected payoff under C,

$$E(y|C) = 0 < \theta,$$

is strictly worse than that under B, the principal cannot credibly commit to withdraw delegation forever after the agent has produced a disastrous governing performance. She would rather play the equilibrium of perpetuated slacking. Similarly, because the principal's payoff under R,

$$E(y|R) = \theta - r < \theta,$$

is strictly dominated by that under B, the principal can neither credibly commit to withdraw supervision forever after the agent has produced an excellent governing performance.

Punishments the principal threatens to the agent can be understood as low continuation values to the agent, while rewards the principal promises the agent can be understood as high continuation values. For any continuation value to be credible, it must be the agent's payoff in an equilibrium.

Lemma 2.

1. *There exists $\sigma \in \mathcal{E}$ such that $U(\sigma) = u$ if and only if $u \in [\underline{u}, \overline{u}]$, where*

$$\underline{u} := \inf_{\sigma \in \mathcal{E}} U(\sigma) \in (0, w]$$
$$\overline{u} := \sup_{\sigma \in \mathcal{E}} U(\sigma) \in [w, w + r).$$

2. *For all $\sigma \in \mathcal{E}$, $V(\sigma) \in [\theta, \overline{v}(U(\sigma))]$, where*

$$\overline{v}(u) := \sup_{\sigma \in \mathcal{E}: U(\sigma) = u} V(\sigma) \in [\theta, \theta + \beta)$$

is concave in u.

3. *If $\sigma \in \mathcal{E}$ and $V(\sigma) = \overline{v}(U(\sigma))$, then $V(\sigma|_h) = \overline{v}(U(\sigma|_h))$ holds for all $h \in \mathcal{H}$ on the equilibrium path of σ.*

According to Lemma 2, the principal can credibly provide to the agent any continuation value within the closed interval $[\underline{u}, \overline{u}]$. The lower bound $\underline{u}$ is the most severe punishment the principal can credibly threaten to the agent, while the upper bound $\overline{u}$ is the most generous reward she can credibly promise. Because the equilibrium of perpetuated slacking is always available, $\underline{u} \leq w \leq \overline{u}$ must hold. Moreover, in any equilibrium, the principal's payoff must be at least θ, that is, her equilibrium payoff under σ_B. Hence, a continuation value to the agent cannot be credible if it requires the principal to have a payoff lower than θ to provide. Furthermore, for each u that can be credibly provided, there must be an *efficient* way of providing it, which yields the principal the largest possible equilibrium payoff $\overline{v}(u)$ given that the agent has u. The curve

$$\{(u, \overline{v}(u)) : u \in [\underline{u}, \overline{u}]\}$$

is often referred to as the *frontier* of equilibrium payoff pairs. At last, if an equilibrium payoff pair lies on the frontier, then the payoff pairs in its all possible continuations are on the frontier as well. This implies that if incentives are efficiently provided in an equilibrium, they must also be efficiently provided along its continuations. The optimal equilibrium must necessarily generate a payoff pair on the frontier. Hence, to fully characterize the optimal equilibrium, it is sufficient to characterize the frontier, that is, function $\overline{v} : [\underline{u}, \overline{u}] \to [\theta, \theta + \beta]$.

Assumption 1. *$w > \underline{w}(\theta)$, where $\underline{w}(\theta) > 1/\delta$.*

In what follows, we maintain the above assumption, which requires that the privilege of governing the local affairs is sufficiently important for the agent. The mode of governance is important exactly because the allocation of power and privilege in local politics carries substantial stakes. This assumption implies that punishments in the form of centralizing are always easier to sustain than rewards in the form of relenting, so that the principal's ability to credibly provide rewards implies her ability to credibly threaten punishments.

5. Recurrent regimes

To incentivize the agent's effort, the principal must make his effort consequential. There are two possible ways, corresponding to two pure action profiles, C as a punishment and R as a reward. For the principal to credibly threaten C and promise R, her disutility from these

action profiles must be compensated by higher continuation payoffs in the future. Here, we characterize two incentive regimes under which punishments and rewards are credible and appear recurrently on their equilibrium paths.

5.1. Recurrent centralizing

Definition 2. $\sigma \in \mathcal{E}$ is an equilibrium of *recurrent centralizing* if it has the following properties on the equilibrium path:

1. $\sigma(h_0) = \hat{a}(\sigma) \in \{G, C\}$;
2. for all $t \geq 1$,

$$\sigma(h_t) = \begin{cases} G, & y_{t-1} \geq \hat{y}(\sigma) \\ C, & y_{t-1} < \hat{y}(\sigma) \end{cases}$$

if $m_{t-1} = (0, 1)$ and

$$\sigma(h_t) = \begin{cases} G, & z_t > \hat{z}(\sigma) \\ C, & z_t \leq \hat{z}(\sigma) \end{cases}$$

if $m_{t-1} = (1, 1)$, where $\hat{y}(\sigma) \in \mathbb{R}$ and $\hat{z}(\sigma) \in [0, 1]$.

The set of all equilibria of recurrent centralizing is $\mathcal{E}_C \subseteq \mathcal{E}$.

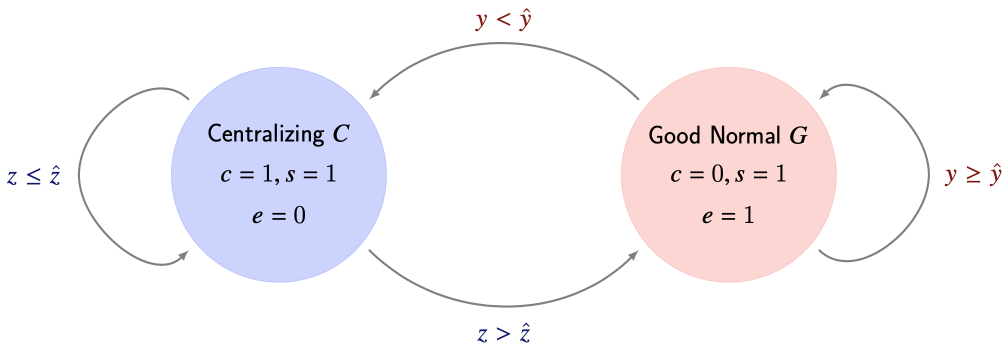

Figure 1: Recurrent centralizing

In an equilibrium with recurrent centralizing, the principal periodically abolishes and re-establishes delegation; while whenever local affairs are delegated, the principal supervises the agent and the latter exerts effort. As a result, the two players cycle between two action profiles, G and C, on the equilibrium path. Because the principal never leaves the agent unsupervised, she never suffers from his rent-seeking behaviors. During periods of G, she

benefits from both the agent's expertise and his effort in managing local affairs. During periods of R, however, the principal forgoes both. Centralization serves as a punishment to incentivize the agent's effort when local affairs are delegated to him.

An equilibrium of recurrent centralizing, $\sigma \in \mathcal{E}_C$, is characterized by an *initial action profile* $\hat{a}(\sigma) \in \{G, C\}$ and a *transition rule* between the two possible action profiles G and C defined by two parameters $\hat{y}(\sigma)$ and $\hat{z}(\sigma)$. First, if the current action profile is G, then in the subsequent period, the two players switch to C if the agent generates a sufficiently bad governing performance $y < \hat{y}(\sigma)$ and otherwise, they continue playing G. In other words, the principal punishes the agent's disastrous governing performance by centralizing local affairs and $\hat{y}(\sigma)$ can be understood as the *performance benchmark* in σ that defines how bad the agent's governing performance must be to get punished. Second, if the current action profile is C, then the two players use the public randomization device to coordinate on the action profile in the subsequent period: with probability $\hat{z}(\sigma)$ they continue playing C and with the complementary probability they switch to G. The larger $\hat{z}(\sigma)$ is, the longer the principal would keep local affairs centralized before re-establishing delegation. Hence, $\hat{z}(\sigma)$ can be understood as the *duration* of centralizing in σ.

Lemma 3. *If $\sigma \in \mathcal{E}_C$, then $\sigma|_h \in \{\sigma, \sigma'\}$ holds for all $h \in \mathcal{H}$ on the equilibrium path of σ, where $\sigma' \in \mathcal{E}_C$ satisfies*

$$\hat{a}(\sigma') \neq \hat{a}(\sigma),\ \hat{y}(\sigma') = \hat{y}(\sigma),\ \hat{z}(\sigma') = \hat{z}(\sigma).$$

Consider an equilibrium of recurrent centralizing $\sigma \in \mathcal{E}_C$ in which the play begins with $\hat{a}(\sigma) = C$. According to Lemma 3, σ is paired with another equilibrium of recurrent centralizing $\sigma' \in \mathcal{E}_C$ that differs only in the initial action profile $\hat{a}(\sigma') = G$. Moreover, following any history h on the equilibrium path, the continuation of σ coincides with either itself or σ': $\sigma|_h = \sigma$ if $\sigma(h) = C$ and $\sigma|_h = \sigma'$ if $\sigma(h) = G$. Hence, σ induces two equilibrium payoff pairs. In any period of C the principal and the agent get $(U(\sigma), V(\sigma))$ corresponding to σ, while in any period of G they get $(U(\sigma'), V(\sigma'))$ corresponding to σ'. To ease notations, we write here $(u, v) = (U(\sigma), V(\sigma))$, $(u', v') = (U(\sigma'), V(\sigma'))$, $\hat{y} = \hat{y}(\sigma)$, and $\hat{z} = \hat{z}(\sigma)$.

Because σ is an equilibrium, two conditions must necessarily hold. First, in any period of G when the agent is delegated local affairs, the agent must have incentive to exert effort, choosing $e = 1$. This condition is referred to as the *incentive compatibility* for the agent. Second, whenever the transition rule requires, the principal must be willing to centralize local affairs rather than deviating to play the stage game equilibrium B permanently. Otherwise, the principal's threat to punish the agent by centralizing is empty. This condition is referred

to as the *credibility* for the principal.

Consider first the agent's incentive, characterized by the two possible payoffs he receives in σ, u under C and u' under G. By definition,

$$\begin{aligned} u &= \delta\left((1-\hat{z})u' + \hat{z}u\right) \\ u' &= (1-\delta)(w-1) + \delta\left(\left(1-F(\hat{y}-\theta-\beta)\right)u' + F(\hat{y}-\theta-\beta)u\right), \end{aligned}$$

solving

$$u' - u = \frac{1-\delta}{1+\delta F(\hat{y}-\theta-\beta)-\delta\hat{z}}(w-1) > 0, \tag{1}$$

so that the agent is better off under G than under R. Then, in any period of G when the agent is delegated local affairs, the payoff differential $u - u'$ renders him an incentive to prevent the governing performance from dropping below $\hat{y}$, following which he would lose the privilege of managing local affairs. The larger this payoff differential, the stronger the incentive. Formally, by exerting effort, $e = 1$, the agent expects to get u', while by slacking, $e = 0$, he expects

$$(1-\delta)w + \delta\left(\left(1-F(\hat{y}-\theta)\right)u' + F(\hat{y}-\theta)u\right).$$

Hence, the agent is willing to exert effort if and only if

$$\delta\left(F(\hat{y}-\theta) - F(\hat{y}-\theta-\beta)\right)(u'-u) \geq 1-\delta, \tag{2}$$

where the right hand side is the agent's cost of exerting effort in the current period and the left hand side is his expected gain in the future periods by reducing the probability of generating a governing performance that falls below $\hat{y}$ to let the principal centralize. Taking (1) into (2) yields the incentive compatibility condition for the agent in terms of $\hat{y}$ and $\hat{z}$:

$$\frac{\delta\left(F(\hat{y}-\theta) - F(\hat{y}-\theta-\beta)\right)}{1+\delta F(\hat{y}-\theta-\beta)-\delta\hat{z}}(w-1) \geq 1. \tag{IC-C}$$

Now consider the principal's payoff in σ, v under C and v' under G. By definition,

$$\begin{aligned} v &= \delta\left((1-\hat{z})v' + \hat{z}v\right) \\ v' &= (1-\delta)(\theta+\beta) + \delta\left(\left(1-F(\hat{y}-\theta-\beta)\right)v' + F(\hat{y}-\theta-\beta)v\right), \end{aligned}$$

solving

$$v' - v = \frac{1-\delta}{1+\delta F(\hat{y}-\theta-\beta)-\delta\hat{z}}(\theta+\beta) > 0. \tag{3}$$

Hence, the principal is always strictly better off under G than under C. Moreover, whenever the transition rule demands, the principal is willing to implement the punishment by centralizing than deviating to play the stage game equilibrium B forever if and only if $v' \geq \theta$ or, equivalently,

$$\delta(1-\hat{z})(v'-v) \geq (1-\delta)\theta. \tag{4}$$

The right hand side of (4) is the principal's cost of centralizing in the current period from losing the agent's expertise in managing local affairs, while the left hand side is her expected gain in the future periods from re-establishing delegation. Taking (3) into (4) leads to the credibility condition for the principal in terms of $\hat{y}$ and $\hat{z}$:

$$\frac{\delta(1-\hat{z})}{1+\delta F(\hat{y}-\theta-\beta)-\delta\hat{z}}(\theta+\beta) \geq \theta. \tag{CD-C}$$

Proposition 1.

1. *$\mathcal{E}_C \neq \emptyset$ if and only if $\beta \geq \overline{\beta}_C(\theta)$, where $\overline{\beta}_C(\theta) \in (0,1)$ is strictly increasing in θ.*[8]

2. *For all $\sigma \in \mathcal{E}_C$,*

$$V(\sigma) = \overline{v}\left(U(\sigma)\right) = \frac{\theta+\beta}{w-1}U(\sigma).$$

3. *If $\mathcal{E}_C \neq \emptyset$, there exists a unique $\sigma_C \in \mathcal{E}_C$ such that*

$$U(\sigma_C) = \inf_{\sigma\in\mathcal{E}_C} U(\sigma) = \frac{(w-1)\theta}{\theta+\beta}$$
$$U(\sigma'_C) = \sup_{\sigma\in\mathcal{E}_C} U(\sigma);$$

moreover, $\hat{a}(\sigma_C) = C$, $V(\sigma_C) = \theta$, and

$$V(\sigma'_C) = \sup_{\sigma\in\mathcal{E}_C} V(\sigma).$$

[8] $\overline{\beta}_C$ uniquely solves

$$\min_{y\in\mathbb{R}} \frac{1-\delta\left(1-F(y)\right)}{\delta\left(F(y+\beta)-F(y)\right)} = \frac{\beta(w-1)}{\theta+\beta}.$$

According to Proposition 1, recurrent centralizing can be a self-enforcing incentive regime if and only if the agent's effort is sufficiently important in determining governing performance, $\beta \geq \overline{\beta}_C(\theta)$. Because $\overline{\beta}_C(\theta)$ is strictly increasing in θ, recurrent centralizing is easier to sustain when the agent's expertise matters less for governing performance. Intuitively, this is because under recurrent centralizing, the principal incentivizes the agent's effort by periodically giving up exploiting his expertise. The principal benefits more from doing so when the agent's effort matters more and she loses less when the agent's expertise is less important.

The second part of Proposition 1 implies that under recurrent centralizing, incentives are efficiently provided to the agent. If $\sigma \in \mathcal{E}_C$, then σ yields the principal the largest payoff among all possible equilibria that render the agent the payoff of $U(\sigma)$. Moreover, in any equilibrium of recurrent centralizing, the principal's payoff is proportional to that of the agent. This is because in such an equilibrium, the two players cycle between two action profiles G and C, so that their payoffs must lie on the straight line connecting the stage game payoffs under G, $(w-1, \theta+\beta)$, and those under C, $(0,0)$. The slope of this straight line is $(\theta+\beta)/(w-1) > 0$.

Lastly and most importantly, Proposition 1 characterizes the *most punishing* equilibrium of recurrent centralizing for the agent, $\sigma_C \in \mathcal{E}_C$, that imposes on the agent the lowest possible payoff among all equilibria of recurrent centralizing. This equilibrium has the initial action profile of C, yields the principal her lowest possible equilibrium payoff $V(\sigma_C) = \theta$, and when the players switch to G, the principal receives her largest possible payoff $V(\sigma'_C)$ among all equilibria of recurrent centralizing. More interestingly, σ_C maximizes the agent's payoff differential between C and G and, therefore, provides the agent with the strongest incentive to exert effort among all possible equilibria of recurrent centralizing. Because σ_C minimizes both players' payoffs and its paired equilibrium σ'_C maximizes them among all possible equilibria of recurrent centralizing, the two players can get the payoffs in any other equilibrium of recurrent centralizing by randomizing between σ_C and σ'_C.[9]

Proposition 2. *Given that $\beta \geq \overline{\beta}_C(\theta)$, there exists a unique $\gamma_C(\beta,\theta)$ such that*

$$\begin{aligned}
\hat{y}(\sigma_C) &= \gamma_C(\beta,\theta) + \theta + \beta \\
\hat{z}(\sigma_C) &= 1 - \frac{\theta}{\beta}\frac{1-\delta+\delta F\left(\gamma_C(\beta,\theta)\right)}{\delta} \\
V(\sigma'_C) &= \theta + \frac{1-\delta}{1-\delta+\delta F\left(\gamma_C(\beta,\theta)\right)}\beta
\end{aligned}$$

[9] This follows from the "bang-bang property" proved by Abreu et al. (1990).

and $\gamma_C(\beta, \theta)$ is strictly decreasing in β and strictly increasing in θ.[10]

Proposition 2 shows the comparative statics about the most punishing equilibrium of recurrent centralizing, σ_C. With a larger β or smaller θ, σ_C entails a more forgiving performance benchmark and a longer duration of centralizing, so that the principal centralizes less often, but once centralization is in place, the principal waits longer before re-establishing delegation. This is because the principal always benefits from backloading the costly punishment threatened to the agent to the future. When the agent's effort matters more for local governance or when his expertise matters less, the principal is able to credibly threaten a harsher punishment—a longer duration of centralizing. The harsher punishment, in turn, enables the principal to use a more forgiving performance benchmark to incentivize the agent. As a result, centralization becomes more difficult to trigger and thus is expected to happen later.

5.2. Recurrent relenting

Definition 3. $\sigma \in \mathcal{E}$ is an equilibrium of *recurrent relenting* if it has the following properties on the equilibrium path:

1. $\sigma(h_0) = \tilde{a}(\sigma) \in \{G, R\}$;
2. for all $t \geq 1$,

$$\sigma(h_t) = \begin{cases} G, & y_{t-1} < \tilde{y}(\sigma) \\ R, & y_{t-1} \geq \tilde{y}(\sigma) \end{cases}$$

if $m_{t-1} = (0, 1)$ and

$$\sigma(h_t) = \begin{cases} G, & z_t > \tilde{z}(\sigma) \\ R, & z_t \leq \tilde{z}(\sigma) \end{cases}$$

if $m_{t-1} = (0, 0)$, where $\tilde{y}(\sigma) \in \mathbb{R}$ and $\tilde{z}(\sigma) \in [0, 1]$.

The set of all equilibria of recurrent relenting is $\mathcal{E}_R \subseteq \mathcal{E}$.

In an equilibrium of recurrent relenting, the principal always delegates local affairs to the agent and she periodically withdraws and re-imposes supervision; while whenever supervised,

[10] γ_C is the smallest y that solves

$$\frac{1 - \delta\left(1 - F(y)\right)}{\delta\left(F(y + \beta) - F(y)\right)} = \frac{\beta(w - 1)}{\theta + \beta}.$$

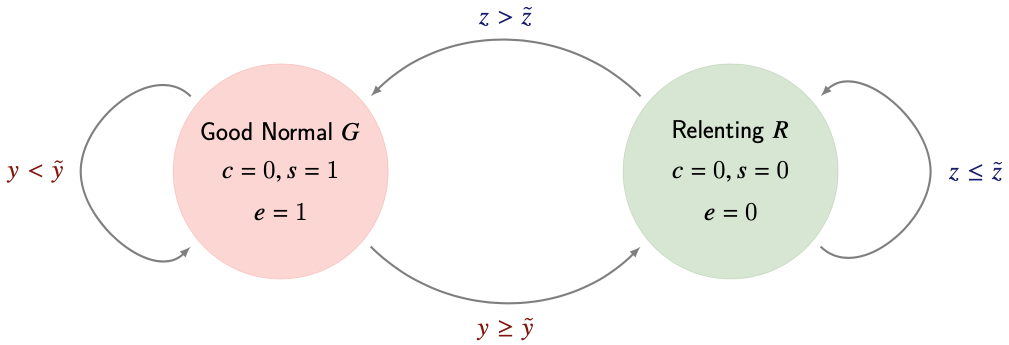

Figure 2: Recurrent relenting

the agent exerts effort. As a result, the two players cycle between two action profiles, G and R, on the equilibrium path. Because the principal always delegates local affairs, she always benefits from the agent's expertise. During periods of G, she, in addition, enjoys the agent's effort; but in exchange, during periods of R, the principal withdraws supervision and relents the agent's rent-seeking behaviors. The withdrawal of supervision serves as a reward to incentivize the agent's effort when he is supervised.

Similarly to an equilibrium of recurrent centralizing, each equilibrium of recurrent relenting, $\sigma \in \mathcal{E}_R$, is characterized by an initial action profile $\tilde{a}(\sigma) \in \{G, R\}$ and a transition rule consists of a performance benchmark $\tilde{y}(\sigma)$ and a duration of relenting $\tilde{z}(\sigma)$. The difference is that here the performance benchmark defines how good the agent's governing performance must be to get rewarded. When the current action profile is G, the two players switch to R in the subsequent period if and only if the agent generates some $y \geq \tilde{y}(\sigma)$.

Lemma 4. *If $\sigma \in \mathcal{E}_R$, then $\sigma|_h \in \{\sigma, \sigma'\}$ holds for all $h \in \mathcal{H}$ on the equilibrium path of σ, where $\sigma' \in \mathcal{E}_R$ satisfies*

$$\tilde{a}(\sigma') \neq \tilde{a}(\sigma),\ \tilde{y}(\sigma') = \tilde{y}(\sigma),\ \tilde{z}(\sigma') = \tilde{z}(\sigma).$$

Also similarly to the case of recurrent centralizing, every equilibrium of recurrent relenting is paired with another such equilibrium that differs only in the initial action profile. Every continuation of an equilibrium of recurrent relenting must either coincide with itself or with its pair. Consider a $\sigma \in \mathcal{E}_R$ such that $\tilde{a}(\sigma) = R$ and let $\sigma' \in \mathcal{E}_R$ be the paired equilibrium. Then, the two players in any continuation of σ would either receive the payoffs of $(U(\sigma), V(\sigma))$ or $(U(\sigma'), V(\sigma'))$. To ease notations, we write here $(u, v) = (U(\sigma), V(\sigma))$, $(u', v') = (U(\sigma'), V(\sigma'))$, $\tilde{y} = \tilde{y}(\sigma)$, and $\tilde{z} = \tilde{z}(\sigma)$. Because σ is an equilibrium, it must be incentive compatible for the agent to exert effort when supervised; and it must be credible for the principal to withdraw supervision whenever the transition

rule requires.

Consider first the agent's incentive, characterized by the two possible payoffs he receives in σ, u under G and u' under R. By definition,

$$\begin{aligned} u &= (1-\delta)(w+r) + \delta\left(\tilde{z}u + (1-\tilde{z})u'\right) \\ u' &= (1-\delta)(w-1) + \delta\left(\left(1 - F(\tilde{y}-\theta-\beta)\right)u + F(\tilde{y}-\theta-\beta)u'\right), \end{aligned}$$

solving

$$u - u' = \frac{1-\delta}{1-\delta F(\tilde{y}-\theta-\beta) + \delta(1-\tilde{z})}(r+1) > 0. \tag{5}$$

Hence, the agent better off under R than under G. In any period of G when the agent is supervised, the payoff differential $u - u'$ renders him an incentive to improve the governing performance over $\tilde{y}$, following which he would be able to benefit from rent-seeking behaviors. The larger this payoff differential, the stronger the incentive. Formally, the agent is willing to exert effort if and only if

$$\delta\left(F(\tilde{y}-\theta) - F(\tilde{y}-\theta-\beta)\right)(u-u') \geq 1-\delta, \tag{6}$$

where the right hand side is the agent's cost of exerting effort in the current period and the left hand side is his expected gain in the future periods by increasing the probability of generating a governing performance that exceeds $\tilde{y}$ to let the principal withdraw supervision. Taking (5) into (6) leads to the incentive compatibility condition for the agent in terms of $\tilde{y}$ and $\tilde{z}$:

$$\frac{\delta\left(F(\tilde{y}-\theta) - F(\tilde{y}-\theta-\beta)\right)}{1-\delta F(\tilde{y}-\theta-\beta) + \delta(1-\tilde{z})}(r+1) \geq 1. \tag{IC-R}$$

Now consider the principal's payoffs in σ, v under R and v' under G. By definition,

$$\begin{aligned} v &= (1-\delta)(\theta-r) + \delta\left(\tilde{z}v + (1-\tilde{z})v'\right) \\ v' &= (1-\delta)(\theta+\beta) + \delta\left(\left(1 - F(\tilde{y}-\theta-\beta)\right)v + F(\tilde{y}-\theta-\beta)v'\right), \end{aligned}$$

solving

$$v' - v = \frac{1-\delta}{1-\delta F(\tilde{y}-\theta-\beta) + \delta(1-\tilde{z})}(r+\beta) > 0. \tag{7}$$

Hence, in contrast to the case of the agent, the principal is always strictly better off under

G than under R. Moreover, whenever the transition rule requires, the principal prefers to withdraw supervision than deviating to the stage game equilibrium B if and only if $v' \geq \theta$ or, equivalently,

$$\delta(1-\tilde{z})(v-v') \geq (1-\delta)r. \tag{8}$$

Note that the right hand side of (8) is the principal's cost of withdrawing supervision in the current period from the agent's rent-seeking behaviors and the left hand side is her expected gain in the future periods from re-establishing supervision. Taking (7) into (8) leads to the credibility condition for the principal in terms of $\tilde{y}$ and $\tilde{z}$:

$$\frac{\delta(1-\tilde{z})}{1-\delta F(\tilde{y}-\theta-\beta)+\delta(1-\tilde{z})}(r+\beta) \geq r. \tag{CD-R}$$

Proposition 3.

1. *$\mathcal{E}_R \neq \emptyset$ if and only if $r > 1/\delta - 1$ and $\beta \geq \overline{\beta}_R(r)$, where $\overline{\beta}_R(r) > 1$ is strictly decreasing in r.*[11]

2. *For all $\sigma \in \mathcal{E}_R$,*

$$V(\sigma) = \overline{v}\left(U(\sigma)\right) = \theta + \beta + \frac{r+\beta}{r+1}\left(w - 1 - U(\sigma)\right).$$

3. *If $\mathcal{E}_R \neq \emptyset$, there exists a unique $\sigma_R \in \mathcal{E}_R$ such that*

$$U(\sigma_R) = \sup_{\sigma \in \mathcal{E}_R} U(\sigma) = w + \frac{r(\beta-1)}{r+\beta}$$
$$U(\sigma'_R) = \inf_{\sigma \in \mathcal{E}_R} U(\sigma);$$

moreover, $\tilde{a}(\sigma_R) = R$, $V(\sigma_R) = \theta$, and

$$V(\sigma'_R) = \sup_{\sigma \in \mathcal{E}_R} V(\sigma).$$

According to Proposition 3, recurrent relenting can be sustained as an incentive regime if and only if two conditions are met: first, the agent's gain from rent-seeking behaviors must be sufficiently large, $r > 1/\delta - 1$; and second, the agent's effort must be sufficiently important

[11] $\overline{\beta}_R$ uniquely solves

$$\min_{y \in \mathbb{R}} \frac{1-\delta F(y)}{\delta\left(F(y+\beta)-F(y)\right)} = \frac{(r+1)\beta}{r+\beta}.$$

in determining governing performance, $\beta \geq \overline{\beta}_R(r)$. The first condition is necessary because otherwise, the benefit from rent-seeking behaviors is too low to induce the agent's effort. Similarly with the case of recurrent centralizing, the second condition is necessary because under recurrent relenting, the principal incentivizes the agent's effort by periodically giving up deterring his rent-seeking behaviors. The principal benefits more from doing so when the agent's effort matters more for local governance.

Recall that r is what the agent gains at the principal's expense from rent-seeking behaviors. Hence, a surprising finding in Proposition 3 is that because $\overline{\beta}_R(r)$ is strictly decreasing in r, recurrent relenting is easier to sustain when the principal loses more from the agent's rent-seeking behaviors. Note that a larger r has two effects: it makes recurrent relenting simultaneously more costly for the principal and a more powerful regime to incentivize the agent's effort. The second effect dominates as long as the agent's effort is sufficiently important for local governance, $\beta > \overline{\beta}_R(\infty)$. In this case, the principal profits from losing more from the agent's rent-seeking behaviors in exchange for a stronger incentive for him to exert effort.

The second part of Proposition 3 implies that under recurrent relenting, the agent's incentives are efficiently provided. In any equilibrium of recurrent relenting $\sigma \in \mathcal{E}_R$, the principal receives the largest possible payoff among all possible equilibria that yield the agent the payoff of $U(\sigma)$. In contrast to the case of recurrent centralizing, the principal's payoff in any equilibrium of recurrent relenting is affine and strictly decreasing in that of the agent. This is because in such an equilibrium, the two players cycle between G and R, so that their payoffs must lie on the straight line connecting the stage game payoffs under G, $(w-1, \theta+\beta)$, and those under R, $(w+r, \theta-r)$. The slope of this straight line is $-(r+\beta)/(r+1) < 0$.

The third part of Proposition 3 characterizes the *most rewarding* equilibrium of recurrent relenting, $\sigma_R \in \mathcal{E}_R$, that renders the agent the largest possible payoff among all equilibria of recurrent relenting. This equilibrium has the initial action profile of R, yields the principal her lowest possible equilibrium payoff $V(\sigma_R) = \theta$, and when the players switch to G, the principal receives her largest possible payoff $V(\sigma'_R)$ among all equilibria of recurrent relenting. Moreover, σ_R maximizes the agent's payoff differential between R and G, so that it provides the agent with the strongest incentive to exert effort among all equilibria of recurrent relenting. At last, because σ_R minimizes the principal's payoff and maximizes that of the agent among all possible equilibria of recurrent relenting and because σ'_R does the opposite, the two players can get the payoffs in any other equilibria of recurrent relenting by randomizing between σ_R and σ'_R.

Proposition 4. *Given that $r > 1/\delta - 1$ and $\beta \geq \overline{\beta}_R(r)$, there exists a unique $\gamma_R(\beta, r)$ such*

that

$$\tilde{y}(\sigma_R) = \gamma_R(\beta, r) + \theta + \beta$$
$$\tilde{z}(\sigma_R) = 1 - \frac{r}{\beta}\frac{1 - F\left(\gamma_R(\beta, r)\right)}{\delta}$$
$$V(\sigma'_R) = \theta + \frac{1-\delta}{1 - \delta F\left(\gamma_R(\beta, r)\right)}\beta$$

and $\gamma_R(\beta, r)$ *is strictly increasing in* β *and* r.[12]

Proposition 4 shows the comparative statics about the most rewarding equilibrium of recurrent relenting, σ_R. With a larger β or r, σ_R entails a more challenging performance benchmark and a longer duration of relenting, so that the agent is relented less often but once the principal withdraws supervision, she waits longer before re-imposing supervision. The intuition is similar to the case of σ_C. When the agent's effort matters more for local governance or when he benefits more from rent-seeking behaviors, the principal can credibly promise a more generous reward and thus better able to backload delivery of her promise further into the future. Interestingly, the principal's payoff in σ'_R, $V(\sigma'_R)$, is strictly increasing in r, which implies that the principal benefits from increasing how much the agent can gain at her expense in seeking rents. This is because given that the agent's effort is important enough to sustain recurrent relenting, it worths for the principal to better incentivize the agent's effort through letting him embezzle more at her expense under relenting.

6. The trilemma of local governance in centralized states

This section characterizes the optimal equilibrium. The provision of incentive entails history dependence on the equilibrium path, linking the agent's current governing performance to future punishments or rewards. The prospect of punishments following bad performance or rewards following good performance create payoff differentials that incentivize the agent's effort.

Lemma 5.

1. *There exists an equilibrium with* C *on the equilibrium path and thus* $\underline{u} < w$ *if and only if* $\beta \geq \underline{\beta}_C(\theta)$, *where* $\underline{\beta}_C(\theta) \in \left(0, \overline{\beta}_C(\theta)\right)$;

[12] γ_R is the largest y that solves

$$\frac{1 - \delta F(y)}{\delta\left(F(y+\beta) - F(y)\right)} = \frac{(r+1)\beta}{r+\beta}.$$

2. *there exists an equilibrium with R on the equilibrium path and thus $\overline{u} > w$ if and only if $\beta \geq \underline{\beta}_R(\theta, r)$, where $\underline{\beta}_R(\theta, r) \in \left(1, \overline{\beta}_R(r)\right)$;*

3. *If $\beta < \underline{\beta}_C(\theta)$, then $\underline{u} = w = \overline{u}$ and thus σ_B is the unique equilibrium.*

To ease notation in what follows, we suppress the arguments in the thresholds $\underline{\beta}_C, \overline{\beta}_C, \underline{\beta}_R, \overline{\beta}_R$ whenever it causes no confusion.

As shown in the previous section, both punishments and rewards are costly for the principal and, as a result, her incentives must be taken into account. Lemma 5 makes clear that whether and how the principal uses punishment or reward depend on the importance of the agent's effort in determining governing performance. When effort is sufficiently unimportant, $\beta < \underline{\beta}_C$, the principal never provides any incentive. The only equilibrium is perpetuated slacking, in which the principal always chooses supervised delegation regardless of the agent's performance. In this case, the conventional wisdom of managing local affairs via supervised delegation is valid. In contrast, when effort becomes sufficiently important, the principal is able to create a payoff differential via punishment or reward. Punishment is always in the form of centralizing, with the principal abolishing delegation. The form that reward takes is subtler, depending how important agent's effort is, as measured by β. A sufficiently large β that exceeds $\underline{\beta}_R$ renders the principal credibility of promising relenting so as to reward the agent. As the importance of effort declines, dropping below $\underline{\beta}_R$, the principal refrains from tolerating the agent's rent-seeking behaviors. Instead, reward takes the form of slacking under which the agent's slack is tolerated despite the imposition of supervision.

6.1. The optimal equilibrium

Here we characterize the optimal equilibrium σ^*. As proved by Abreu et al. (1990), on any equilibrium path of σ^*, the history at each t is fully summarized by the payoff the principal promises to the agent at the beginning of t,

$$u_t := U\left(\sigma^*|_{h_t}\right).$$

Hence, each equilibrium path under σ^* consists of a sequence of payoffs the agent is promised, $(u_0, u_1, ...)$. In what follows, we slightly abuse notation to write $\sigma^*(u)$ as the action profile the principal and the agent coordinate to play and $\sigma^*|_u$ as the continuation equilibrium at any t that the agent is promised the payoff of $u_t = u$. In addition, two quantities are important

for $\sigma^*|_u$:

$$\pi^*(u) := \Pr\left(u_{t'} = \underline{u} \text{ for some } t' \geq t \mid u_t = u, \sigma^*\right)$$

is the probability for the agent to incur punishment in future periods and

$$\rho^*(u) := \Pr\left(u_{t'} = \overline{u} \text{ for some } t' \geq t \mid u_t = u, \sigma^*\right)$$

is the probability for the agent to receive reward in future periods.

Proposition 5. *If $\beta \geq \underline{\beta}_C$, then there exist $\underline{u}_G, \overline{u}_G$ such that $\underline{u} < \underline{u}_G < \overline{u}_G < \overline{u}$ with the following properties:*

1. *$\overline{v}(u)$ is affine and strictly increasing in $u \in [\underline{u}, \underline{u}_G)$, strictly concave in $u \in [\underline{u}_G, \overline{u}_G]$, affine and strictly decreasing in $u \in (\overline{u}_G, \overline{u}]$, and $\overline{v}(\underline{u}) = \overline{v}(\overline{u}) = \theta$;*
2. *$u_0 \in [\underline{u}_G, \overline{u}_G]$;*
3. *$\sigma^*(u) = G$ for all $u \in [\underline{u}_G, \overline{u}_G]$;*
4. *$\pi^*(u) > 0$ for all $u \in [\underline{u}, \overline{u}_G)$;*
5. *$\rho^*(u) > 0$ for all $u \in (\underline{u}_G, \overline{u}]$.*

Figure 3 illustrates the frontier of equilibrium payoff pairs characterized in Proposition 5. This characterization helps to identify key features of equilibrium play. As long as $\beta > \underline{\beta}_C$, so that incentives can be provided, the optimal equilibrium begins with the good normal G, under which the principal chooses supervised delegation and the agent exerts effort. All the three goals the principal seeks—motivating bureaucratic effort, exploiting local expertise, and deterring rent-seeking behavior—obtain. However, such an ideal outcome is sustained by promised punishment or reward that must eventually emerge on the equilibrium path in future periods. In particular, as showed in Proposition 5, $\pi^*(u_0) > 0$ so long as $u_0 < \overline{u}_G$ and $\rho^*(u_0) > 0$ so long as $u_0 > \underline{u}_G$.

Proposition 6. *If $\beta \geq \underline{\beta}_C$, then for all $u_t \in [\underline{u}_G, \overline{u}_G]$,*

$$u_{t+1} = \phi(y_t|u_t) \in [\underline{u}, \overline{u}],$$

where $\phi : \mathbb{R} \times [\underline{u}_G, \overline{u}_G] \to [\underline{u}, \overline{u}]$ has the following properties:

1. *$\phi(y|u)$ is increasing in y for all $u \in [\underline{u}_G, \overline{u}_G]$ and strictly increasing if $u \in (\underline{u}_G, \overline{u}_G)$;*

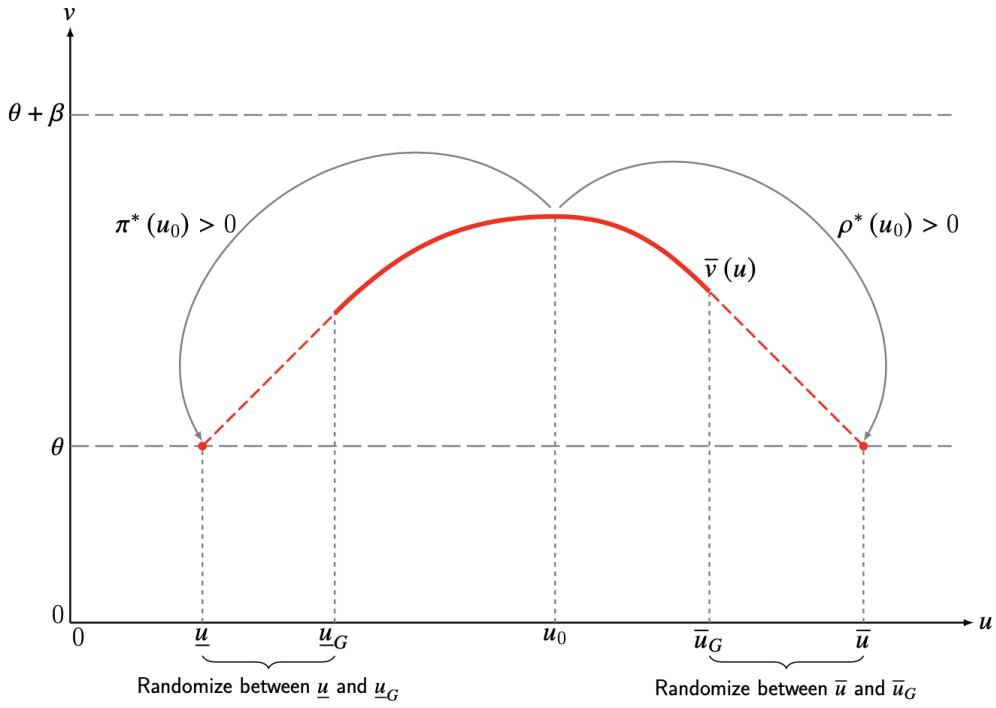

Figure 3: Equilibrium payoff frontier

2. $\phi(y|\underline{u}_G) = \underline{u}$ *if* $y < \underline{y}$ *and* $\phi(y|\underline{u}_G) \geq \underline{u}_G$ *if* $y \geq \underline{y}$, *where* $\underline{y} \in \mathbb{R}$;

3. $\phi(y|\overline{u}_G) = \overline{u}$ *if* $y \geq \overline{y}$ *and* $\phi(y|\overline{u}_G) \leq \overline{u}_G$ *if* $y < \overline{y}$, *where* $\overline{y} \in \mathbb{R}$.

The above proposition describes how the equilibrium play transitions from the good normal to punishment or reward. Whenever under the good normal, the principal promises the agent a larger continuation payoff if he generates a better governing performance. So long as $\phi(y_t|u_t) \in [\underline{u}_G, \overline{u}_G]$, the play remains under the good normal. If disastrous governing performance accumulates, punishment is triggered and the agent receives $\underline{u}$. In contrast, accumulation of excellent governing performance finally leads to reward, in which case the principal promises $\overline{u}$ to the agent. An immediate consequence of these results is that the good normal cannot last forever, with punishment or reward triggered in finitely many periods. In other words, at least one action profile among centralizing, relenting, and slacking is bound to emerge on the equilibrium path.

The results established in the two propositions above suggest that the optimal equilibrium features a *probationary phase* in initial periods in which the two parties engage in the good normal. Whether punishment or reward is finally triggered depends on the agent's record of governing performance during this phase. This result is reminiscent of Ray (2002) which shows, in a general principal-agent problem, that costly provision of incentives is backloaded as much as possible. Nonetheless, as we clarify below, the extent to which these incentives

can be backloaded is constrained by the principal's lack of commitment in our model, with centralizing and relenting being either temporary or sustained by self-enforcing recurrent regimes characterized in the previous section.

6.2. The trilemma

Proposition 7. *For $\underline{u}$, the following hold:*

1. *if $\beta \geq \overline{\beta}_C$, then $\sigma^*|_{\underline{u}} = \sigma_C$, $\rho^*(u) = 0$ for all $u \in [\underline{u}, \underline{u}_G]$, and*

$$\underline{u} = U(\sigma_C) = \frac{(w-1)\theta}{\theta + \beta};$$

2. *if $\beta \in [\underline{\beta}_C, \overline{\beta}_C)$, then $\sigma^*(\underline{u}) = C$, $\rho^*(u) = 1$ for all $u \in [\underline{u}, \overline{u}]$, and*

$$\frac{(w-1)\theta}{\theta + \beta} < \underline{u} < w.$$

For $\overline{u}$, the following hold:

1. *if $\beta \geq \overline{\beta}_R$, then $\sigma^*|_{\overline{u}} = \sigma_R$, $\pi^*(u) = 0$ for all $u \in [\overline{u}_G, \overline{u}]$, and*

$$\overline{u} = U(\sigma_R) = w + \frac{r(\beta - 1)}{r + \beta};$$

2. *if $\beta \in [\underline{\beta}_R, \overline{\beta}_R)$, then $\sigma^*(\overline{u}) = R$, $\pi^*(u) = 1$ for all $u \in [\underline{u}, \overline{u}]$, and*

$$w < \overline{u} < w + \frac{r(\beta - 1)}{r + \beta};$$

3. *if $\beta \in [\underline{\beta}_C, \underline{\beta}_R)$, then $\sigma^*|_{\overline{u}} = \sigma_B$, $\pi^*(\overline{u}) = 0$, and $\overline{u} = U(\sigma_B) = w$.*

As shown in Lemma 5, the importance of the agent's effort to governing performance is the key determinant of the existence of punishment and reward as well as the forms they take. Proposition 7 further establish how β determines whether punishment and reward are temporary or absorbing. The first part of this proposition concerns punishment. As long as $\beta \geq \underline{\beta}_C$, punishment emerges on the equilibrium path, taking the form of centralizing. If β is sufficiently large, so that $\beta \geq \overline{\beta}_C$, punishment is supported by the most punishing equilibrium of recurrent centralizing, σ_C. This punishment regime is absorbing. Hence, once the agent is promised a sufficiently low continuation payoff $u \leq \underline{u}_G$, he would never be rewarded in the future. In contrast, in the moderate case where $\beta \in \left[\underline{\beta}_C, \overline{\beta}_C\right)$, recurrent

centralizing cannot be sustained. Consequently, punishment can only be temporary, so that even when punished, the agent expects to get rewarded in the future.

The second part of Proposition 7 concerns reward, which emerge on the equilibrium path in the form of relenting if $\beta \geq \underline{\beta}_R$ and in the form of slacking if $\beta \in \left[\underline{\beta}_C, \underline{\beta}_R\right)$. When effort is extremely important, so that $\beta \geq \overline{\beta}_R$, reward is supported by the most rewarding equilibrium of recurrent relenting, σ_R. This reward regime is absorbing and, therefore, the agent will never be punished once promised a sufficiently high payoff $u \geq \overline{u}_G$. If $\beta \in \left[\underline{\beta}_R, \overline{\beta}_R\right)$, recurrent relenting cannot be sustained. As a result, reward, despite continuing to take the form of relenting, can only be temporary. The agent expects to be punished in the future even when rewarded. As the importance of effort further declines, so that $\beta \in \left[\underline{\beta}_C, \underline{\beta}_R\right)$, the principal never withdraws supervision, and reward is supported by the equilibrium of perpetuated slacking, σ_B. It is again absorbing, and once the agent is rewarded with slacking, he is forever in slack. Figure 4 summarizes the above discussions.

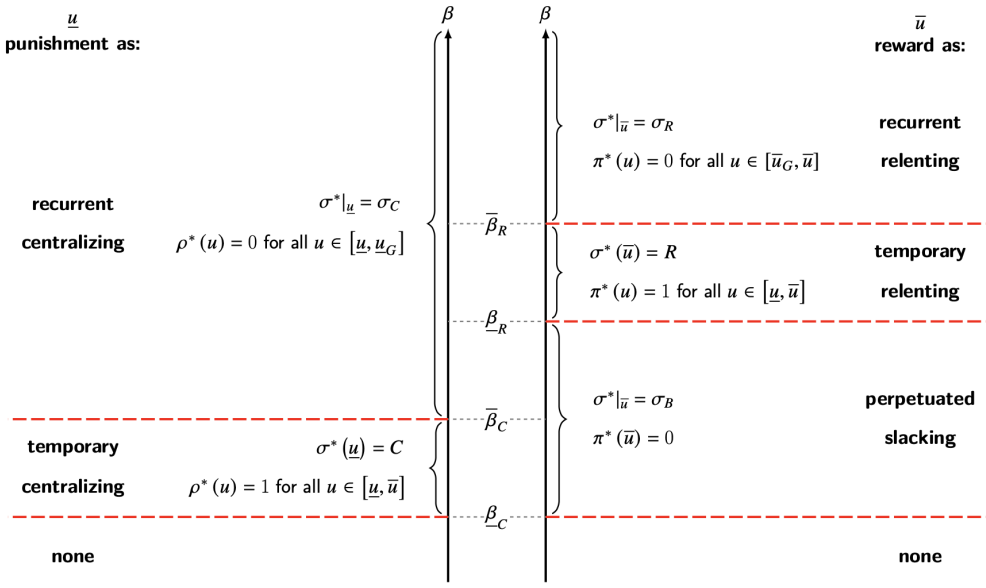

Figure 4: Reward and punishment

Corollary 1. *On any equilibrium path of the optimal equilibrium σ^*, there exists a minimal $T \geq 0$ such that $\sigma^*|_{u_T} \in \{\sigma_B, \sigma_C, \sigma_R\}$ and in particular,*

1. $\sigma^*|_{u_T} \in \{\sigma_C, \sigma_R\}$ *if* $\beta \geq \overline{\beta}_R$;
2. $\sigma^*|_{u_T} = \sigma_C$ *if* $\beta \in [\underline{\beta}_R, \overline{\beta}_R)$;
3. $\sigma^*|_{u_T} \in \{\sigma_B, \sigma_C\}$ *if* $\beta \in [\overline{\beta}_C, \underline{\beta}_R)$;
4. $\sigma^*|_{u_T} = \sigma_B$ *if* $\beta < \overline{\beta}_C$.

The above corollary, which follows immediately from Proposition 7, is our main result. In the long run, the relationship between the principal and the agent evolves into either perpetuated slacking, or recurrent centralizing, or recurrent relenting. Consequently, the local governance in a centralized state inevitably faces a trilemma: in the long run, the principal cannot achieve all her three goals—motivating bureaucratic effort, exploiting local expertise, and deterring rent-seeking behaviors—at the same time. This trilemma is illustrated in Figure 5. When the relationship is trapped in perpetuated slacking, although the principal delegates local affairs to the agent to exploit his expertise and imposes supervision to deter his rent-seeking behaviors, the agent lacks incentive to exert effort. In contrast, the two recurrent regimes incentivize the agent's effort. However, the principal either occasionally forgoes the agent's local expertise, as in recurrent centralizing, or occasionally suffers from the agent's rent-seeking behaviors, as in recurrent relenting. This trilemma is inherent in the optimal administration of local bureaucracy in a centralized state, which incentivizes the local bureaucrats by future modes of governance but is subject to the lack of commitment.

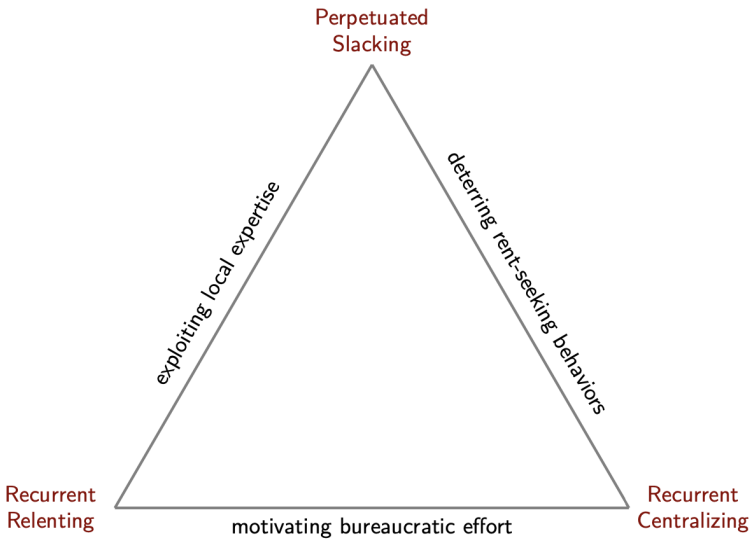

Figure 5: The trilemma of local governance

It is noteworthy that in case 1 and 3 in Corollary 1, the optimal equilibrium features path dependence and long-run polarization. Accumulation of disastrous governing performance in the early stages triggers an absorbing punishment regime, whereas accumulation of excellent governing performance finally leads to an absorbing reward regime. In case 3, the punishment regime is recurrent centralizing, while the reward regime is perpetuated slacking. Especially interesting is case 1 where both long-run punishment and reward regimes feature permanent cycling, recurrently deviating from the conventional

wisdom of supervised delegation. Depending on the agent's early governing performance in the probationary phase, the relationship end up with either periodical abolishment and re-establishment of delegation, or periodical withdrawal and re-imposition of supervision.

In case 2 and 4, the relationship settles into a unique absorbing long-run regime with certainty. In case 4, punishment—in the form of centralizing—is temporary, and the relationship eventually enters perpetuated slacking, which resumes the conventional wisdom. In contrast, case 2 features the temporary reward, where, despite the prospect of relenting following accumulation of excellent governing performance in early stages, the relationship is bound to end up with the punishment regime supported by recurrent centralizing. This result is reminiscent of Padró i Miquel and Yared (2012) and Myerson (2015). In both cases, the principal lacks means to credibly reward the agent in the long run, so that the equilibrium play eventually evolves into a punishment regime—a permanent cycling of intervention and non-intervention in Padró i Miquel and Yared (2012) and replacement in Myerson (2015). Here, this pattern is a special case that arises when the agent's effort is moderately important. The key distinction is that in our model, the principal may find ways to cede rents to the agent credibly in the long run, either in the form of recurrent relenting or in the form of perpetuated slacking.

The intuition behind Corollary 1 follows the two contracting frictions in our model: the agent's moral hazard and the principal's lack of commitment. On the one hand, to sustain the *good normal* in the probationary phase, the principal creates incentives by linking the agent's record of governing performance to promised punishment and reward in the future. The past promises become accumulating debts the principal owes to the agent. While postponed as much as possible by the principal, the debts must be paid, and the relationship between the two parties must evolve into a long-run regime where punishment or reward is implemented. The principal eventually has to suffer from either concession of rents or sequential inefficiency. On the other hand, the principal's lack of commitment shapes how punishment and reward can be sustained. To make incentives credible, any long-run regime must be self-enforcing, which entails either perpetuated slacking or a recurrent regime—recurrent centralizing or recurrent relenting. These two contracting frictions, which are inherent in the local governance in centralized states, breed the trilemma. Though seemingly inefficient ex post, the long-run failures the trilemma implies are the inevitable consequences of the principal's optimal balancing of her three goals over time.

7. Historical contexts

7.1. China

In this section, we show that, before Xi took power in 2012, China's governance was aligned with the optimal equilibrium with both recurrent centralizing and recurrent relenting, thereby maximally motivating bureaucratic efforts, $\beta \geq \overline{\beta}_R$. And after 2012, China shifted to the optimal equilibrium with recurrent centralizing and perpetuated slacking, which makes the central government less able to motivate bureaucratic efforts but better at preventing rent-seeking, $\beta \in \left[\overline{\beta}_C, \underline{\beta}_R\right)$. This change, from our perspective, is due to the decreasing benefits of bureaucratic efforts in using their discretionary power.

Given China's historical context of political turmoil during the Cultural Revolution and persistent poverty, economic development became the overriding priority. Local governments tend to support more socioeconomic activities crucial for establishing a more liberalized market economy (Yu and Gao, 2013). Given an underdeveloped market, local officials' efforts of using their discretionary power to intervene and facilitate local economic development were both essential (Oi, 1995; Qian and Weingast, 1997) and sometimes extra-role (Bai et al., 2020), suggesting a high β. We then show that China before 2012 is characterized by delegation to local bureaucrats with periodic adoption of centralizing and relenting of certain types of rent-seeking combined with supervision on the other types.

First, China before 2012 is characterized by extensive delegation to local government. In the age of "Reform and Opening-up" after 1978, while remaining a politically centralized state, China abandoned the rigid and inefficient Leninist style of government and adopted a new system characterized by market liberalization and both administrative and fiscal decentralization (Lieberthal and Lampton, 2018; Oi, 1992). Under the "administrative subcontract system" (Zhou, 2016), the central government highly relies on the local bureaucrats to keep the government functioning.

Second, the Chinese central government periodically retracted the powers it had delegated, adopting an approach known as "campaign-style governance" to control local administration temporarily (Zhou, 2022). This method, characterized by its non-professional and unconventional nature, has been a common response to bureaucratic failures in Chinese history (Kuhn, 2009; Whyte, 1973). However, its non-professional characteristic often leads to inefficiency, resulting in the central government eventually re-delegating administrative authority back to local governments.

Third, parallel to the existence of centralizing, the Chinese central government also relented certain types of rent-seeking while trying to curb the others. The central government allowed local bureaucrats to capture a portion of the rents while promoting

economic development through the form of "organizational corruption," which is more specifically variable allowances and perks (Ang, 2020, 93). Such incentives were provided by the appropriation of the state budget (Fan et al., 2010). At the same time, the central government periodically intensified supervision and crackdowns against conventional forms of corruption. From the institutional perspective, through administrative reforms, the central government also curtailed opportunities for internal administrative corruption, particularly embezzlement and misappropriation of public funds (Ko and Weng, 2012). For more tangible instances, the crackdown on large-scale corruption cases such as the smuggling scandal in Xiamen (Shieh, 2005) appalled the entire nation. In August 1993, the Second Plenary Session of China's Discipline Committee focused on "strengthening the fight against corruption." In the same year, three notable corrupt officials were executed in different cities on the same day.[13] Furthermore, in 1998, then Premier Zhu Rongji again made a strong statement at an anti-corruption meeting, asserting: "I have prepared 100 coffins, 99 for corrupted officials, and one for myself."

This pattern of governance characterized by recurrent centralizing and relenting stopped after 2012. Following Xi's coming to power, the change of mode of governance was widely considered abrupt and unanticipated within the party (Gewirtz, Julian and Wasserstrom, Jeffery, 2017), corresponding to a new equilibrium. Xi's new model is a departure from the "profit-sharing" model entrenched in the previous decades, emphasizing control of the local bureaucrats and prevent rent-seeking (Xi et al., 2021). In his incumbency, China no longer uses the allowance for rent-seeking to provide incentives and only recurrent centralizing or perpetuated slacking are observed long-term outcomes, characterized by lower tolerance for rent-seeking and dampened efforts of the bureaucrats at the local level (Chen et al., 2023; Wang, 2022; Wang and Yan, 2020). The most famous example of stopping the relenting of rent-seeking is the *eight-point decision on improving Party and government conduct* announced in 2012,[14] which imposed significant constraints on rent-seeking by restricting opportunities for lavish receptions and unnecessary recreative meetings of bureaucrats, limiting the scale of official visits and ceremonial activities that could be exploited for rent extraction, regulating allowance on vehicles and housing. As anecdotal evidence, an anti-corruption propaganda documentary published in 2016 conveyed the new leadership's views on performance and rent-seeking. In an intriguing scene, Li Chuncheng, the former deputy party secretary of Sichuan Province, after being arrested for corruption, confessed: "I had always held this belief that even if a cadre has

[13]People's Daily, October 30, 1993, page 1, https://cn.govopendata.com/renminribao/1993/10/30/1/#917773.

[14]Xinhua Net, November 24, 2019, http://www.xinhuanet.com/politics/2019-11/24/c_1125267944.htm.

some issues of rent-seeking, as long as a cadre performed, they were still fundamentally upright."[15] This view, clearly, was no longer the case after 2012.

Before using our logic to explain China's pattern of governance before and after 2012, we would like to engage with existing literature regarding one paradox of China's governance. Zhou (2022) captures a phenomenon in China's local governance as the paradox of "tight-coupling leading to the loss of initiatives and loose-coupling leading to the loss of control." The bureaucratic system is disrupted by centralization that "generate unintended consequences, such as immobilism among local officials" (Zhou, 2022, 22) or falls into chaos due to a lack of necessary supervision, leading to rent-seeking behavior that causes disutility to the central government. Zhou (2022) conveys that delegation or centralizing is a correction after the other mode results in a negative outcome. This argument is explanatory in various cases, however, the story is not complete because it does not consider the dimension of supervision: if the goal is to utilize local expertise and prevent rent-seeking, why does not the principal choose supervised delegation? A plausible justification is saying that the principal faces uncertainty regarding the effect of a policy and is likely to over-centralize or failing to provide enough supervision. This argument implies that supervised delegation is optimal and should be chosen by the principal whenever it is feasible. However, empirically, we still see the central government intentionally allowing rent-seeking when it can be prevented and intentionally centralizing when it is able to curb rent-seeking under delegation. For example, in environmental governance, though endowed with strong informational capabilities and the ability to prevent rent-seeking, the Chinese central government still recurrently revokes local bureaucracy's discretion in pollution control as a form of punishment (Van der Kamp, 2021). At the same time, the Chinese central government has long granted local bureaucrats material benefits for implementing tasks assigned by their superiors and sometimes these benefits were realized through rent-seeking (Ang, 2020; Rong et al., 1998). To a large extent, the central government has deliberately tolerated such rent-seeking behavior, as evidenced by the anti-corruption campaigns after 2012, where the central government never lacks the technology to supervise.

Our model suggests that the Chinese central government adopts centralizing and relenting to motivate bureaucratic efforts. Centralizing can serve as a punishment for low performance. We then show how the case of blunt-force regulation and tolerated rent-seeking stems from the need to punish or reward the agent. Given the imperfect monitoring of bureaucratic efforts in controlling pollution, the Chinese central government

[15] People's Daily Online, October 17, 2016, http://politics.people.com.cn/n1/2016/1017/c1001-28785651.html.

will initiate blunt-force regulation that uses one-size-fits-all sanctions to shut down firms when the local government continues to fail to make firms comply. Such blunt-force regulation scares local bureaucrats into compliance and is recurrent because the central government cannot commit to the indefinite shutdown of firms given the inefficiency (Van der Kamp, 2021). Relenting, on the contrary, is a reward for good service of the local bureaucrats. Bai et al. (2020) characterizes that local government officials in China are enthusiastic about tasks that are technically outside their formal responsibilities, such as attracting more private investment and maintaining relationships with business owners. Their enthusiasm stems from the rent-seeking opportunities these activities provide. On the organizational level, the allowance for rent-seeking is linked with the economic performance of the agent (Ang, 2020, 93). Ang (2020, 56) conveys that "granting local governments and local agencies the right to generate and retain extra-budgetary revenue may be understood as part of a nationwide 'profit-sharing' scheme...This incentivized the entire bureaucracy to embrace market reforms and dive headlong into making money."

We further show that the decreasing importance of bureaucratic efforts is a driving force for the change of equilibrium after 2012. As the economy gradually matures, the former growth model that relied on local bureaucrats attracting investment and intervening in markets by using their discretionary power can no longer meet China's objective for "high-quality development." Promoting further marketization, optimizing the business environment, and restricting the government's predatory powers have become more important. The central government's crackdown on "localism" (Bulman and Jaros, 2021) is an example of how the discretionary power of local bureaucrats, which once facilitated economic growth, is now an obstacle to China's further marketization. China's large-scale digital reforms after 2012 and the promulgation of regulations to optimize the business environment[16] reflect the central government's requirement for local bureaucrats to operate in compliance with rules, transforming from interventionists into market maintainers.[17] For example, known as a "pioneer of reform," Zhejiang Province is one of China's most prosperous regions with the highest level of government modernization. After 2012, many of its reforms (Gao, 2019; Gao and Tan, 2020) emphasized reducing local governments' discretionary power in key areas such as investment attraction and public services (Gao, 2020), with bureaucratic efforts giving way to following the rules and protecting the

[16]The State Council of the People's Republic of China, October 23, 2019, https://www.gov.cn/zhengce/content/2019-10/23/content_5443963.htm.

[17]On the central government's idea of "high-quality development" and the transition of the role of government, see: The State Council of the People's Republic of China, October 27, 2017, https://www.gov.cn/zhuanti/2017-10/27/content_5234876.htm; July 24, 2018, https://www.gov.cn/zhengce/2018-07/24/content_5308748.htm; October 20, 2022, https://www.gov.cn/xinwen/2022-10/20/content_5720050.htm.

market. As Xi himself pointed out, "Slacking may harm the Party and the nation, but reckless efforts can cause even greater harm!"[18] This implies that motivating efforts come with costs that cannot justify their benefit.

7.2. Roman Egypt

In 30 BCE, after defeating his rival Mark Antony and eliminating Ptolemaic Egypt, Octavian annexed the Egyptian territory as a province of Rome, initiating the historical period known as "Roman Egypt." Thereafter, Egypt played a crucial role in providing the Roman Empire with food and tax revenues. From the early to the late Roman Empire, Egypt's administrative system underwent a process of increasing bureaucratization, aimed primarily at enhancing administrative efficiency, controlling officials' slack and corruption, and ultimately meeting the empire's growing needs for tax revenue. The bureaucratization of the Roman Empire was a gradual process with several reforms and Roman Egypt was no exception (Adams, 2006; Kelly, 2006). Though changes in governance were gradual, we can still characterize the governance modes of Roman Egypt by two distinct periods: from Augustus to Diocletian and post-Diocletian. Diocletian is a demarcation point because his accession marked the end of the chaotic Third Century Crisis. By this time, Roman Egypt was under the stable administration of a centralized state while bearing less connection to the era of Augustus after more than two hundred years. Diocletian's new policies reflected the response of a political principle to the changing importance of bureaucratic efforts. By contrasting the early governance mode of Roman Egypt and Diocletian's reforms of the Egyptian administrative system, we illustrate how this prudent emperor attempted to shift Egypt from perpetuated slacking towards a system with stricter accountability to punish governance failures and improve official efforts.

Augustus revived and developed Egypt's economy through reforms and the construction of infrastructure. For a period thereafter, the taxes provided by Egypt (including tariffs levied on merchant ships) were sufficient (McLaughlin, 2014; Wallace, 2015) without the need for great efforts to excessively extract wealth. As Wallace (2015) points out at the beginning of his book: "The conquest of Egypt made ready to Octavian's hand the great resources of the richest grain-lands of the time. The conqueror was able to exploit these resources with but few changes in the system of agricultural economy."

Therefore, we believe that early Roman Egypt did not emphasize the importance of bureaucratic efforts, in stark contrast to the fiscal difficulties faced by the empire around the third century. This is also evidenced by the low flat tax rate for private land adopted in

[18]The State Council of the People's Republic of China, December 10, 2021, https://www.gov.cn/xinwen/2021-12/10/content_5659796.htm.

early Roman Egypt (Monson, 2007, 2012).

We then show that early Roman Egypt's equilibrium was perpetuated slacking, with the mode of governance being supervised delegation and the agent exerting no effort, as predicted by the model when $\beta < \underline{\beta}_C$.

First, there was extensive delegation in early Roman Egypt to localized bureaucrats. Early Roman Egypt is widely regarded as a "bureaucracy without bureaucrats," a summary that reflects the early Roman reliance on a very small number of local bureaucrats (and their informal staff) to govern Egypt (Adams, 2010). During this stage, Egypt's complex ethnic composition and an established administrative system inherited from Ptolemaic Egypt both required and helped the Roman Empire to highly delegate to local bureaucrats. In the measures taken by Octavian, who was later known as Augustus, to integrate Egypt as a province of Rome, the senior administrative officials and the leadership of the repressive apparatus were held by Roman citizens outside of Egypt, while the local (especially at the grassroots) administrative structures made extensive use of the expertise of locals. As Monson (2012, 246) says, "rather than relying on a professional bureaucracy, it shifted power to landowning urban elites, making them responsible for their own local self-government." The priority task, taxation, was delegated to locals in a flexible way (Capponi, 2005, 136). And such localized bureaucracy was maintained in place in the next two centuries (Bureth, 1965).

Second, the delegation was supervised, with no evidence of relenting. During the Ptolemaic era, it was fundamental for the functionality of the tax farming system to allow officials to undertake public duties voluntarily and profit from them (Monson, 2012). However, such a system caused a considerable loss of state revenue (Bingen, 2007, 271-272) as a large portion of the taxes was intercepted by agents. Consequently, the Romans adopted a series of reforms after taking over Egypt to curb corruption. After Augustus's reforms, public affairs became a compulsory obligation (Capponi, 2005, 69-81), no longer a voluntary duty or a recognized channel of rent-seeking. Other aspects of the reform, such as reducing public expenditure, regulating state agents, decentralizing the government, and enhancing market competition, were also identified by Monson (2012, 261) as aligning with anti-corruption measures of modern states. Another example is *the Edict of Vergilius Capito* in 48 AD, which was publicly announced and sought to reduce corruption by banning officials from demanding from civilians on the road (Lewis, 1954). Admittedly, corruption is still rampant in this province of a pre-modern empire, but it is mostly a consequence of the governors' inability instead of the unwillingness to curb corruption (Brunt, 1975).

Third, we do not observe centralizing in early Roman Egypt and the bureaucracy was

slacking. While successfully levering the expertise of the locals, centralization was not a keyword in early Roman Egypt and officials were reluctant to exert effort for public services. As far as we know, no clear evidence showed that Rome punishes local bureaucrats who failed to deliver good governance outcomes through centralizing affairs, but instead, documented penalties are applied to the evasion of participating in public duties. Since undertaking public duties was seen as a financial burden, individuals had no incentive to exert effort for such affairs and evading responsibilities was a common occurrence. Principals often struggled to find enough volunteers for tax collection (Monson, 2012, 239). By Monson (2012, 243-244), those who evaded their duties would have their properties confiscated, while their communities would also be penalized. Alternatively speaking, the problem is not how well the performance is, but rather finding bureaucrats and exploiting their expertise. This, we admit, is not decisive evidence since it could be due to the lack of archives itself. However, compared with rich materials discussing bureaucratic punishment in the third century, our evidence serves as a "straw in the wind test" (Mahoney, 2012) that discourages the likelihood that there was the same level of bureaucratic punishments during early Roman Egypt compared to later. We cautiously speculate that this was because Roman Egypt at this time had not yet undergone large-scale bureaucratization and many public affairs were handled in a non-professional manner by individuals with a certain amount of wealth.

In the third century, the Roman Empire started to face a financial crisis (Scheidel, 2014, 110-113), which is the driving force of the bureaucratization in the following periods. It became a central objective for Emperor Diocletian to collect more taxes to replenish the increasingly depleted national treasury, serving as funding for military expenses and other public expenditures (Finer, 1997). His reign witnessed a rapid expansion of bureaucracy, policies to establish more capable local governments, and a higher tax rate (Elton, 2006; Van Sickle, 1938). The bureaucratic system Diocletian took over is characterized by inefficiency and disobedience, in sharp contrast to his need for effort. We consider that the importance of bureaucratic effort was higher than in early Roman Egypt during the period, evidenced by Diocletian's policies to establish more provinces and divide existing administrative regions into finer units (Barnes, 1982, 224), with the aim of increasing overall efforts by appointing a large number of new bureaucrats (Adams, 2006; Elton, 2006). We argue that this corresponds to the case that $\beta \geq \underline{\beta}_C$ and, according to the predictions of our model, is likely to lead to the occurrence of punishment. We then show that Roman Egypt under Diocletian's rule was indeed characterized by supervised delegation and centralizing, with no relenting of rent-seeking.

First, without any doubt, Roman Egypt in Diocletian's era was still ruled by a highly delegated government. As shown in Adams (2006, 2010), local officials still had large

discretion in governing local affairs and had the potential of shirking. Municipal councils retained considerable autonomy and bore many administrative responsibilities.

Second, we observe harsher punishment and evidence of centralizing in Roman Egypt during Diocletian's era. Papyrus records indicate that the pressures of reforms associated with Diocletian's changes reached the grassroots level of the Egyptian government and caused significant friction (Adams, 2010). A tense relationship formed between local officials and municipal councils, particularly when the latter could not support the former in completing tasks mandated by higher authorities—local officials cautiously avoided being held accountable by their superiors because continuous failures could lead to "appropriate threats" or even capital punishment. For example, an official from Lower Thebaid wrote to his superiors using vehement language to berate the council president, claiming that the latter's laziness and moral corruption were the reasons for the uncompleted tasks, not his own failure (Adams, 2010). Other cases of correspondence between local officials showed that they anticipate significant risks, which can be losing their position or lives, if they failed to deliver desirable outcomes (Adams, 2006, 90). These all illustrate that during this period, Roman Egyptian local bureaucrats could be credibly punished by the upper-level government. Another compelling piece of evidence is that during Diocletian's reign, special envoys (*comites provinciarum*) trusted by the emperor started to be dispatched to the provinces. As confirmed by the Theodosian Code[19] and Jones (1986, 105), these envoys were sent to the provinces to take over jurisdiction over disputes and receive complaints about maladministration of the local leadership. These envoys served *de facto* to exercise temporary control over the regular provincial administration by intervening in and overriding the authority normally exercised by the latter (Wiewiorowski, 2013).

Third, the delegation is still supervised with no sign of relenting. Roman Egypt in Diocletian's era insists on limiting rent-seeking. According to *P.Panop.Beatty*, officials guilty of malfeasance and rent-seeking were punished upon detection. Admittedly, there is no evidence that punishments for rent-seeking and administrative abuse were consistently implemented, but Roman Egypt under Diocletian did not view these issues as tolerable, let alone condone or encourage them to motivate officials—especially, in cases involving harm to the state treasury or widely publicized instances of administrative abuse, the treatment is even harsher, documented in *P.Panop.Beatty*.

An excellent summary of the Diocletian reform in Roman Egypt can be found in Adams (2006), where the author commented that this profoundly interventionist stance is characterized by "the willingness of state officials to intervene directly in local affairs and

[19]Cod Th 16. 7.

to issue threats against inefficiency and corruption." Despite a series of reforms aimed at enhancing the efficiency and effort of bureaucratic institutions, the Roman bureaucracy during the era of Diocletian, including in Roman Egypt, was still perceived as inefficient and lethargic, failing to resolve issues in the long term and still resulted in slacking (Adams, 2006). We suspect that this corresponds to the case when $\beta \in \left[\underline{\beta}_C, \overline{\beta}_C\right)$ so that temporary punishment is possible to occur but the long-term absorbing state is still perpetuated slacking. One explanation for why β is moderate in Diocletian's Roman Egypt is that the Romans still rely on the expertise of local elites to govern this vast and heterogeneous province with its own profound history of governance. The importance of local expertise makes recurrent centralizing as an incentive regime too costly to be credible for the central government to promise.

7.3. The English East India Company

The English East India Company (1600-1784) has long been thought of as one of the most prominent prototypes of modern bureaucracy, and to a large extent, a state-like organization established during the mercantilist time. Our theoretical results, hence, could also apply in the context of the company. As we elaborate below, the company's organizational history exemplifies how a successful organization could gradually evolve to *Recurrent Relenting*, and how a dramatic decline in the principal's reliance on local initiative would lead to *Perpetuated Slacking*. Our analysis of the organizational history of the Company is based on Erikson (2014).

One of the most notable feature of the company's organizational practice is that it formally granted its employees the rights to engage in private trade between Asia and Europe. Captains and officers of the company were tolerated to divert the paths of the company's ships to buy and sell goods. In our paper, these practices of private trade that undermined the company's chartered monopoly privileges in the overseas trade are formalized as the agent's rent-seeking behaviors. Our theoretical results demonstrate that when the agent's effort is sufficiently important to the governing performance that $\beta \geq \overline{\beta}_R$, while the principal maintains supervised delegation in the early stages, the relationship between the principal and the agent evolves to *Recurrent Relenting* in the long run following accumulation of excellent governing performance. In the long run, the principal periodically withdraws supervision to acquiesce to rent-seeking behaviors, motivating the agent to exert costly effort. In line of our analysis, during the early periods of the 17th century, private trade was illegal. The Company struggled to enforce the rule against its captains conducting the practices then viewed as corruption by the Court of Directors. Patrols, which corresponds to the imposition of supervision in our model, was documented

to be sent out to monitor illegal transactions at sea. Once caught, both goods and ships would be confiscated. On the other hand, the company kept expansion during this time.

However, the Court of Directors gradually legitimated its employees' engagement in private trade in the late 17th century, with many of the private trade regulations being enacted between 1660 and 1680. In 1661, the company opened parts of country trade to its employees. The risk of dismissal due to participation in private trade was removed. Employees were even allowed to use Company bills of exchange to remit their fortunes made from private trade back to England. Supervision, which had been imposed during earlier periods, was deliberately withdrawn by the Company, which is formally captured by the action profile *relenting* in our model. Consistent with *Recurrent Relenting* under which incentives are provided by the prospect of rent-seeking behaviors following excellent governing performance, there is evidence showing that the Company intentionally used private trade allowances as remuneration for the service of its employees. Initiative was successfully created. Research on the history of the Company attributes the beginning of its expansionary era which occurred coincidentally from around 1660 to 1700 to the legitimation of private trade, believing that private trade allowances encouraged its employees to explore new ports and goods.

Hence, the 17th century history of the English East India Company could be possibly understood in lens of our theoretical results concerning the evolution from the *good normal* to *Recurrent Relenting* following accumulation of good performance. As we have shown, this pattern may emerge on the equilibrium path if the agent's effort is extremely important so that $\beta \geq \overline{\beta}_R$. It is believed that the Company's embrace of private trade was linked to its need for fungible overseas capital. Due to mercantilist dogmatism prevailing in the 17th and 18th centuries, exporting bullion from England was then strictly restricted. Consequently, the Company had to rely on its employees' initiative for overseas capital, so that private trade allowances served as an incentive tool for this purpose. Moreover, the Company might also leverage private trade to motivate the exploration of new ports and goods. The prevalence of private trade was therefore indeed the Company's conscious response to the importance of its employees' effort.

Despite the rapid expansion in the 17th and 18th centuries, the Company eventually began a long-period decline and settled into a typical and unproductive pattern of exploitation, a static pattern which takes resemblance to *Perpetuated Slacking* in our model. The dramatic change happened in 1757 when the victory of the Battle of Plassey granted the Company de facto territorial sovereign of Bengal. The most immediate consequence was that the Company was now able to appoint tax collectors in Bengal. The land taxes provide an alternative and vast source of silver bullion for which the Company

had relied on its employees' initiative created by its compromise on private trade. More profoundly, the Company became more and more interested in territorial rather than commercial expansion after the battle. The aftermath of the battle, hence, significantly reduced the Company's dependence on initiative of its captains in the overseas trade in Asia. Our theoretical results have established that when the agent's effort is sufficiently unimportant so that $\beta < \underline{\beta}_R$ or even $\beta < \underline{\beta}_C$, the relationship between the principal and the agent may be eventually trapped in *Perpetuated Slacking*, with the principal maintaining supervised delegation and the agent permanently slacking. In line of our analysis, private trade had become illicit and increasingly contained under supervision since 1760s. Captains' autonomous engagement in private trade was targeted and curtailed. A series of acts were made, undermining the employees' ability to engage in their own private trade. Among these acts included one passed in 1776 which forbade any deviation from ships' ordered routes. The threat of dismissal was increased should captains be caught to violate Company rules. By 1787, employees of the Company were almost entirely excluded from the country trade that had been formally opened to them since 1661. While private trade was deterred, slacking began to prevail. Evidence showed a sustained period of decline in the Company's trade network—which connected active ports in Asia—since the late 18th century onward, indicating a pattern formally captured by *Perpetuated Slacking* in our model.

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