

# Meritocracy, Decentralization, and Party-Government Relationship in One-Party Regimes\*

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## Abstract

Meritocracy and decentralization are the main engines of China's reform and growth. But in an autocracy, competent local politicians with large discretion over policymaking is a huge threat to central authority. Consequently, an autocrat usually selects mediocre politicians and centralize policymaking. China solves the problem by appointing a party secretary and a governor to co-rule a province. The party secretary controls political power, while most economic management is delegated to the governor. The arrangement forestalls local attempt to challenge central authority and establishes central authority's confidence to promote meritocracy and decentralization. I also characterize optimal party-government relationship: secretary should sometime dominates governor but not always the case. This is very different from canonical theories on separation of powers in democracy. My model is robust to several extensions, and can explain key stylized facts of Chinese political economy. I also discuss how the model travels beyond China and contributes to our general understanding of authoritarianism.

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*(Chinese regime) uses the higher ranked official to monitor the lower ranked one. At the same time, (the regime) also uses the lower ranked to divide the power of the higher ranked. The lower ranked cannot execute his power freely because he is monitored by the higher ranked. The high ranked is also constrained and cannot do whatever he wants. This is because his power is divided and delegated to the lower ranked. As a consequence, the central government exerts effective control.*

*The checks between the higher ranked and the lower ranked is a fundamental principle of statecraft in Qing China.*

Luo Er'gang, *Record of Green Standard Army*

## I. Introduction

China implements remarkable political meritocracy and decentralization. Local politicians are promoted based on competence and performance, and most economic policymaking is delegated to the province. They solve many incentive problems and constitute the foundation of China's reform and growth (Roland, Qian, 1998; Maskin, Qian, Xu, 2000; Li, Zhou, 2005; Xu, 2011; Bai, Hsieh, Song, 2014).

However, meritocracy and decentralization contradict the basic logic of autocracy, the loyalty-competence trade-off (Glazer, 2002; Egorov, Sonin, 2011; Svoblik, 2012; Bai, Zhou, 2014). In authoritarian regimes, the leader does not want to appoint very competent subordinate with large policymaking power: the subordinate can use his own competence and policy discretion to challenge the leader. As a consequence, the leader usually appoints mediocre subordinate and centralizes policymaking. Svoblik, (2012) identifies the trade-off as the main dilemma of autocracy. The research question is: what is the Chinese institution that overcomes the dilemma and implements meritocracy and decentralization?

I propose that the institution is the appointment of both a party secretary and a governor to co-rule a province. The party secretary wields formidable political power and he is the first ranked politician. He has huge capacity to mobilize the population through his control of party branches, mass organizations, and propaganda apparatus. The governor serves as the head of

government and deputy party secretary simultaneously, so he is second ranked and a subordinate of the party secretary. However, there is substantial economic delegation to the governor: local party committee does not have any economic departments. All key economic departments are under the direct leadership of the governor. Consequently, the secretary does not have direct access to economic power.<sup>1</sup> The economic delegation to the governor makes it extremely difficult for a province to challenge central authority. This solves the loyalty-competence dilemma and gives the central authority full confidence to decentralize policymaking and promote competent politicians.

The obvious problem is that the secretary sometimes dominates the governor and takes over discretion of policymaking. The standard theory of separation of powers stresses strong checks and balances between politicians, but Chinese regime contradicts the theory and supports the bias towards party secretary. For example, Chinese Constitution guarantees the leadership of party over government. Yet at the same time, the regime also emphasizes that secretary's power should be constrained and he should not take control of everything. At first glance, it is unclear why the regime sometimes support secretary's advantage over governor but not always so. Moreover, prevalent collusion opportunity between secretary and governor endangers the effectiveness of economic delegation. These puzzles render it necessary to explore the mechanism in depth.

To achieve this goal, I adopt a reputation/signal model. There are two types of secretary, benevolent type and normal/selfish type. The benevolent secretary cares about the population intrinsically, while the normal secretary only cares about his own utility. In the benchmark model, there is no economic delegation to the governor. So the secretary can provide public good to signal his benevolence. *The signal is informative as it is costly for secretary to provide public good.* Then the secretary can use his political power to mobilize the population and challenge the central authority. The population is happy to join such collective action: they infer that the secretary is probably benevolent from public good provision, so the secretary will award all benefit from collective action to the population.<sup>2</sup> Thus, discretion over public good is a powerful signaling device

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<sup>1</sup>This is a major difference between China and Soviet Union: a local party committee in Soviet Union had many economic departments, such as agriculture, education, construction, industry, transportation, light and food industry, trade and financial organs (Nough, 1969). This gives Soviet secretary direct access to economic power. In a companion paper, I analyze the economic origins of the divergence in delegation patterns. I propose that market economy in China, which was established de facto in 1980s through dual-track price liberalization, empowers governors in several ways that renders it necessary to delegate economic policymaking. In a planned economy like Soviet Union, delegation of economic power will generate large efficiency loss, which however can be easily avoided in a market economy.

<sup>2</sup>The tactic to buy loyalty through public good provision has been very popular in Chinese politics. Chinese

that solves collective action problem. The higher the discretion delegated to province, the more informative the signal is. Moreover, the benefit from collective action is larger for more competent secretary. So a more competent secretary is more likely to challenge the central authority. In turn, the central authority appoints mediocre secretary and centralize policy discretion over public good.

With economic delegation, signaling effort will fail. *Now the governor bears the cost of public good provision.* This makes the signaling device too cheap for the secretary. A cheap signal is very uninformative, so the population finds it unattractive to join collective action. In the equilibrium with balance of power between secretary and governor, only benevolent governor provides public good, which gives the population full information about the type of governor. *But it tells the population absolutely nothing about the secretary.* Yet mobilization capacity still lies with the secretary, as he still controls key political power. The secretary will abstain any opportunity to challenge central authority, knowing that the population never join it. Freed from loyalty concern, the central authority appoints very competent politicians and decentralize economic policymaking.

The design is robust to the two concerns I mentioned above: secretary's dominance and collusion opportunity. Even if the secretary takes over decision of public good provision or credibly shares benefit from collective action with the governor, it is still the governor that bears the cost of public good. The loyalty concern will be reduced drastically; as a consequence, meritocracy and decentralization prevail.

We will see that with secretary's dominance, there is still positive probability of collective action. Recall that there is no collective action under balance of power. So the model predicts that central authority should enforce a balance of power. However, the analysis ignore any important dimension: the governor has some reasonable chance to be promoted as secretary. Under balance of power, the governor fully reveals his benevolence. He can easily organize collective action when he becomes the new secretary. This is extremely risky and the central authority strictly prefer secretary's dominance

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Communist Party (CCP) itself won victory in Chinese Civil War over the ruling Kuomintang through extensive support of peasants. Peasants supported CCP enthusiastically because CCP enforced aggressive land reform in CCP-controlled areas (Pepper, 1999). Recently, the Bo Xilai Saga is a perfect match with the model: Bo administration initiated phenomenal building of public good, which led to enormous popularity of the administration. However, such popularity failed to transform into real support from the population when Bo was in trouble (Zhao, 2012). As we will see, this is a natural result of the elaborated secretary-governor duality. A more systematic empirical analysis is provided by Persson, Zhuravskaya, (2015). They found that secretaries who can more easily buy loyalty indeed provide more public good such as education and health care to please local elites, and those secretaries are less aligned with objectives of central government.

over governor.

The central authority can do better by creating uncertainty regarding secretary's power *vis-a-vis* the governor. Specifically, denote  $\xi$  as the probability that secretary dominates the governor, and  $1 - \xi$  as the probability that there is a power balance. Note that if  $\xi$  is close to 0 or 1, there is not too much uncertainty. But if  $\xi$  is bounded away from 0 and 1 (so there is uncertainty), the population will refuse to join collective action led by either current secretary or future one (who is the current governor). The intuition is that  $\xi$  *adds noise to the signal*. When the population try to join current collective action launched by current secretary, they don't know whether the public good is provided by a benevolent secretary or a benevolent governor; when the population try to join future collective action to be launched in the future by current governor, they don't know whether the *current* public good is provided by a benevolent governor or a strong secretary who forces the governor to do so. The uncertainty "confuses" the population and forestalls Bayesian learning. The analysis gives a concrete foundation for central authority's contradictory statements and reluctance to clarify party-government relation. Such ambiguity and uncertainty is actually optimal for the central authority.

Several things to notice: 1.  $\xi$  is manipulatable: the central authority can influence people's belief about secretary's strength through the powerful Central Propaganda Department. Also, central authority can calibrate the powers endowed to secretary and governor so that the secretary may take control of public good provision but not always the case. 2. The uncertainty can only be sustained with secretary-governor duality. 3. Governor's dominance over secretary is never optimal. If governor takes over mobilization capacity, effectively we return to the case of no delegation. This can explain why secretary is first ranked and governor is appointed as a subordinate to the secretary: the central authority must prevent the governor's dominance over secretary at all cost.

The analysis of uncertainty over party-state relation echoes literature on strategic belief manipulation in Chinese media censorship (e.g., Lorentzen, 2014). Together with the workhorse model, they provides a game theoretic foundation for regime stability, political meritocracy, and economic decentralization in China and explains many seemingly contradictory puzzles and dilemmas in Chinese political economy.

## 2. Literature Review

The paper relates to a large number of literature. First of all, there is an influential literature on separation of powers in democracy (e.g., Persson, Roland, Tabellini, 1997, 2000; Laffont, 2000; Dragu, Chen, Kuklinski, 2014). The classical contribution of Persson, Roland, Tabellini, (1997) shows that conflict of interest between politicians solves accountability problem. Persson, Roland, Tabellini, (2000) discuss the fiscal implications of separation of powers with checks and balances. Laffont, (2000) investigates the contract design problem associated with separation of powers, especially collusion issues. Dragu, Chen, Kuklinski, (2014) is a complete characterization of Madisonian checks and balances. My research contributes to this line of research by showing that "separation of powers" also works in autocracy, but through drastically different channel with one side substantially weaker than the other side. Taking the collusion concern of Laffont, (2000) seriously, I also show how "separation of powers" in Chinese style achieves collusion-proofness.

Delegation is a key topic in both economics and political science. The standard argument is that delegation utilizes the information advantage of agent (Bendor, Meirowitz, 2004). The key conflict is that the agent's objective usually differs from the principal's. Many papers discuss how to prevent the "bureaucratic drift" of agent, such as discretion limits (Epstein, O'Halloran, 1999), menu law (Gailmard, 2009), and administrative procedures (Spiller, Tiller, 1997). My research shows how the delegation of economic power from secretary to governor benefits a third party, the central authority.

Loyalty-competence tradeoff was recently established as a key dilemma in autocracy. Indeed, Svobik, (2012) advocates it as the key threat for any autocrat in the introductory chapter. Glazer, (2002) studies the dilemma in a private firm, and he emphasizes the tradeoff between external and internal rent-seeking. Egorov, Sonin, (2011) formalizes the tradeoff in a contract theory model, which is supported empirically by Bai, Zhou, (2014). In terms of loyalty concerns associated with decentralization, Bardhan, (2002) notes that decentralization can erode the authority and power of central government.

A large literature engage in the debate of political meritocracy in China (e.g., Maskin, Qian, Xu, 2000; Li, Zhou, 2005; Shi, Adolph, Liu, 2012; Jia, 2014; Persson, Zhuravskaya, 2014; Bai, Hsieh,

Song, 2014; Jia, Kudamatsu, Seim, 2015). The fundamental contribution of Maskin, Qian, Xu, (2000) shows that M-Form in China provides a platform for yardstick competition that strongly promotes political meritocracy, and the theory finds empirical support from Li, Zhou, (2005). The meritocracy story receives backfire recently. Shi, Adolph, Liu, (2012) shows that connection rather than competence plays a fundamental role in promotion, but Jia, Kudamatsu, Seim (2015) finds that political connection and performance are equally important. Jia, (2014), with the title "pollution for promotion", identifies the dark side of meritocracy. Persson, Zhuravskaya, (2014) finds that promotion mechanism is weakened by politicians' social ties. But Bai, Hsieh, Song, (2014) re-establishes meritocracy story through a channel different from Maskin, Qian, Xu, (2000). They argue that "crony capitalism with Chinese characteristics" supports meritocratic promotion and economic growth. Promotion and political meritocracy is one of the most active fields of Chinese political economy. One cannot help take one step back and contemplates whether Chinese institution provides a concrete foundation for meritocracy story. This is where my contribution lies. Complementing the canonical argument that meritocracy works in China because of the organizational structure of M-Form (Maskin, Qian, Xu, 2000), I show that meritocracy also has deep political foundation: the subtle and carefully managed interaction between party and government strongly promotes central authority's confidence to enforce meritocracy.

Decentralization is also a key topic in Chinese economy. Fiscal decentralization kindled the initial reform and growth in China (Weingast, 1995; Qian, Weingast, 1997; Qian, Roland, 1998; Berkowitz, Li, 1999; Jin, Qian, Weingast, 2005). In general, recent effort to decentralize government service receives a lot of attentions in developing country context (Bardhan, 2002). The tide of Chinese fiscal decentralization was reversed in the mid 1990s, but expenditure decentralization never loses its momentum. Xu, (2011) notes that "the total expenditure of Chinese sub-national governments accounted for about 70 percent of the national total, which was far larger than that of the world's largest federal countries such as the United States (46 percent), Germany (40 percent), and Russia (38 percent)". The large spending discretion delegated to provinces allows them to fiercely compete against each other in building infrastructures and provide public service. My paper uses a single foundation to explain both meritocracy and decentralization, the two big forces behind China's economic achievement. We see that loyalty concern brought by either competence or decentralization

is eliminated under delegation. The two key lines of literature that used to develop on their own paths get unified under a single framework.

The party-government relationship is at the heart of Chinese political institution (Shirk, 1992, 1993). But surprisingly it receives at best sparse attention from the academia. Shirk, (1993) is the most important contribution to the topic. Her narrative is quite consistent with my theory. She finds that after Communist victory in Chinese Civil War, China adopted the party-government structure of Soviet Union and pushed it to the extreme form: before 1980s, the party fully took over economic management in China. Beginning in 1980s, Chinese Communist Party (CCP) abolished production departments in party committees and delegated most economic affairs to the government. The reform survives the conservative attack after 1989 and it established the current form of party-government relationship in China, which is the main object of my study. The observation was also mentioned and articulated by Shambaugh, (2008) and Guo, (2009), and the thesis is basically the same. Shirk, (1993) argues that party's delegation to government utilizes later's information advantage and professional knowledge in managing the economy, leading to successful economic reforms in China. To the best of my knowledge, my paper is the first analysis of party-government relation in China using formal models. I propose a different mechanism that emphasizes how party-government relation constrains local officials. The field is currently too small compared to its central importance in Chinese politics, and more research on the topic will help us understand the inner mechanism of Chinese party-state.

Political scientists always have a keen interest on one-party state. But most of the important contributions focus on electoral authoritarian regimes (e.g., Magaloni, 2006), where election is far more substantial than Chinese one. Magaloni, Kricheli, (2010) notes that one-party state is more stable and growth-friendly than other forms of authoritarian regimes. Svoboda, (2012) provides a fantastic argument how party is a good device for co-optation. Because the distribution of party benefit depends on the rank of party member, many benefits can only be realized when the party member ascends over the party hierarchy. This provides strong incentive for party members to support the regime: if the regime falls, all current and *future* benefits associated with party membership will be lost. By devoting my attention to the biggest one-party state that enjoys remarkable stability and phenomenal growth for the past four decades, I hope to provide new insights into the mechanism



of authoritarian resilience.

### 3. Party-state Structure in Chinese Provinces

My focus is local governance. So in this section, I will introduce provincial-level politics in China to provide a concrete background for my modeling exercise. The model fits the provincial-level politics well, and it can be easily extended to sub-provincial level.

In mainland China, there are thirty-one provincial-level territories, which are the highest units of local jurisdictions. I call all of them province for simplicity. In 2014, their median population is 37 million (equivalent of Poland) and the median GDP is 287 billion US dollars (slightly higher than Chile). Thus, province is immensely powerful even vis-a-vis central authority. This is especially the case for two additional reasons. Firstly, Chinese provinces are very self-contained; each of them has a relatively complete array of industry sectors (Qian, Roland, Xu, 2006). This means that a province has sufficient resources to support itself if it tries to disobey central authority. As I have emphasized, there is also a very high degree of economic decentralization in China (Xu, 2011), which reinforces the province's economic independence that can seriously threaten central authority. Indeed, during the 1990s, there's a real concern that China might break up into dozens of states as a consequence of provinces' strong economic power.

The two big players in provincial-level politics are the provincial secretary and the governor. The provincial secretary is the first-ranked politician in a province. He is the head of provincial party committee, which encompasses departments of organization, propaganda, united front, plus the committee of law and politics. The party also directly controls mass organizations such as Labor Union, Women's Union, and Youth League. Among the departments, organization department is in charge of all major personnel decisions. It also controls the huge network of party branches that reside in every social organization. The propaganda department controls newspapers, TV stations, and extensive censorship of the Internet. The united front department directs and communicates with "democratic parties", which are very small parties under CCP's leadership yet with quite elite members. The committee of law and politics was immensely powerful and controlled the court, the police, and the procuratorate until quite recently (China launched a comprehensive reform of

legal system in 2014 and undermined the committee of law and politics, but the effect remains to be seen). Thus, provincial secretary enjoys huge political power and has formidable mobilization capacity.

The governor is second-ranked provincial politician and is subordinate to the secretary. Formally, the governor serves as the head of provincial government and the first-ranked deputy party secretary simultaneously. The most important feature of governor is that all major economic departments are under the leadership of the governor, so the secretary does not directly manage the economy. For example, the governor controls departments of education, industry, agriculture, business, construction, communication, public finance, science and technology, reform and development, and human resource and social welfare. By comparison, there is no economic department within party committee at all.

As a summary, the governor does work under the leadership of secretary, as the governor also serves as deputy secretary. So in my model I assume that the secretary retains all bargaining power in side contract. But it is important to note that the governor has some discretion in economic policymaking. This is because the secretary does not have access to economic departments directly, which earns the governor information advantage. The point is especially clear when we compare party-state structure in China with its counterpart in Soviet Union. Soviet secretary directly controls many economic departments within the party committee, which significantly undermines the governor's information advantage. Thus, a governor in Soviet Union has much less discretion in policymaking. In the benchmark model, I am going to ignore the governor as an active player, as in Soviet Union the secretary directly manages the economy.

As a historical note, secretary-governor relation in contemporary China has dual origins. It is a descendant of Soviet secretary-governor relation, but Chinese governor commands more economic power. At the same time, it also originates from the relation between governor and lieutenant governor in Qing Dynasty (1644 AD- 1911). The prestigious historian Luo Er'gang, whose writing I cited at the beginning, summarizes their relation as "checks between higher ranked and lower ranked". A governor in Qing Dynasty resembles party secretary in current China: he controlled comprehensive power and wielded formal authority over lieutenant governor. But the lieutenant governor directly controls fiscal policy and civil governance. Luo Er'gang contemplates that lieutenant governor was

closely monitored by the governor, so the lieutenant governor could not use his economic power freely. The governor was the boss of a province in Qing Dynasty, but he was still strongly constrained because his real power was divided and delegated to lieutenant governor. Luo Er'gang further emphasizes that checks between higher ranked and lower ranked is a main principle of statecraft in Qing China, and it clearly also applies to military and other civil organizations. Contemporary secretary-governor relation is a reflection of the Qing institution. But it operates in the framework of Communist Party, so it is more institutionalized than its Qing ancestor.

## 4. The Benchmark Model

### 4.1 Setup

I have three players, the principal (central authority), the provincial secretary, and the population. There are four stages in the benchmark game.

**1. Appointment stage:** The central authority chooses the competence of secretary  $W$ , which measures the economic surplus the secretary can produce. There are two ways to conceptualize the capacity of central authority to choose competence. Central authority in China usually faces a large pool of candidates. The Central Organizational Department extensively collect and keep information about these candidates. For example, suppose the central authority needs to appoint a provincial secretary. Then in theory, all politicians ranked as provincial officials are in the pool. The central authority has very detailed record of the candidates' background and achievements, as well as many interviews from their colleagues and subordinates. Thus, central authority can estimate candidates competence quite precisely.

A complementary conceptualization is that the central authority can adjust the way to recruit politicians, thus changing the competence of the whole candidate pool. For example, China consolidated civil service exam about one thousand years ago, thus dramatically improving the competence of the whole politician group. Before the reform era, Communist China did not institutionalize civil service exam, which was only re-established in the 1980s. The new civil service exam again improves

the competence of politicians. Thus, if the central authority reduces the intellectual barrier to become politicians (as what China did in Culture Revolution), we can conceptualize it as reducing the competence of politicians.

The central authority also chooses the degree of decentralization  $k$ , which measures how much public good can be provided by local authority. I will discuss this in more detail at the signaling stage.

The nature determines whether the secretary is normal or benevolent (with probability  $\mu$ ). Intuitively, a normal secretary cares only about his own rent, while a benevolent secretary cares intrinsically about the welfare of the population. If the secretary does not provide public good, status-quo payoff to the secretary is  $Q \equiv \lambda W$ ,  $0 < \lambda < 1$ ,  $\lambda$  being the bargaining power of local politician vis-a-vis central authority. Payoff to principal is  $R \equiv (1-\lambda)W + S$  and payoff to population is normalized to 0.  $S$  is the exogenous rent of autocrat.

Note that there are two dimensions of type: the first dimension is competence. It is chosen by the principal and is observed by everyone in the game. The second dimension is benevolence, and it is private information to secretary. *This is the only source of asymmetric information in the benchmark model.*

**2. Signaling stage:** The secretary decides whether to provide a public good. The population values the public good as  $e(k)$ , while it generates a cost of  $k$  for the secretary. The normal secretary does not value public good, and the benevolent secretary values it at  $\gamma e(k)$  with  $\gamma > 1$ . In the benchmark model, the secretary controls the fiscal power. So he has the capacity to provide public good.

**3. Mobilization stage:** The nature decides whether there is a chance for collective action with probability  $\pi$ . If there is no chance, the normal secretary's payoff is  $Q - k$ , and the population get  $e(k)$ . For a benevolent secretary, the payoff is  $\gamma e(k) - k + Q$ , as he cares intrinsically about the population.

The secretary decides whether to launch a collective action; then the population decides whether to join with a cost of  $c$ . If the secretary launches a collective action, and the population do not join, the normal secretary will get  $-k$  and the benevolent secretary will get  $\gamma e(k) - k$ . Note that

secretary loses status-quo payoff because the principal sacks the secretary.

**4. Divide the pie:** The secretary decides whether to award collective action benefit  $R$  to the population. The normal secretary gets  $R + Q + S - k$  if he capture all benefits, and gets  $Q + S - k$  if he awards  $R$  to the population. The benevolent secretary gets  $R + Q + S + \gamma e(k) - k$  if he captures all benefits, and gets  $Q + \gamma R + S + \gamma e(k) - k$  if he awards  $R$  to the population. In the event that a collective action succeeds, apparently a normal secretary wants to capture all benefits, while a benevolent one wants to award everything to the population. This drastic difference in ex post behavior provides strong incentive for the population to learn the benevolence of secretary, and ideally they only want to join collective action with a benevolent secretary.

Now I introduce three assumptions that I am going to maintain throughout the paper:

***Assumption 1***

$$c > \max\{\mu R, \lambda R\}$$

The assumption  $c > \mu R$  is very standard. Intuitively, it guarantees that the population will not join collective action unless they update their belief on secretary's benevolence. The population will get  $\mu(R - c) + (1 - \mu)(-c) = \mu R - c$  if they join collective action without receiving any signal, and 0 if not. So  $c > \mu R$  makes sure that the secretary has to send some costly signal. The assumption  $c > \lambda R$  is more subtle. It implies that the central authority does not want the benevolent secretary to fully reveal his identity. I will discuss more of it in Section 4.3.

***Assumption 2***

$$\gamma e(k) - k > 0$$

The assumption says that public good provision always generate positive utility for benevolent secretary. The assumption is akin to the “ assumption of commitment type” in reputation literature. Given that public good is severely under-provided in developing countries, this assumption also matches reality very well.

With Assumption 2, I can prove Lemma 2. It confirms the intuition that benevolent secretary will always provide public good in any equilibrium.

The solution concept I am going to employ is Perfect Bayesian Equilibrium (PBE). Last, I am going to introduce the criterion to restrict off-equilibrium belief.

**Assumption 3 (Off-equilibrium Belief)** Denote population's belief about secretary's type immediately after {launch a collective action} as  $\hat{\mu}$ . Denote population's belief about secretary's type immediately after a chance of collective action emerges as  $\bar{\mu}$ .

*If  $\hat{\mu}$  is off equilibrium, then restrict  $\hat{\mu} = \bar{\mu}$ .*

Assumption 3 rules out equilibrium that are trivially free of collective action because crucial beliefs are on off-equilibrium paths. So they are not constrained by Bayes' Rule. This is a major problem with analysis of dynamic games with incomplete information, and many authors have contributed to rule out equilibria that are supported by implausible beliefs (e.g., Cho, Kreps, 1982).

Specifically, it rules out the equilibrium that benevolent secretary already provided public good and reveals his benevolence, but abstain from collective action because population's belief  $\hat{\mu}$  about secretary's type after the secretary chooses {launch} is not high enough. But because all secretaries abstain from collective action, the event {launch} happens with probability zero. This means that any belief  $\hat{\mu} \in [0, 1]$ , however implausible it is, does not violate Bayes' Rule. But we will see that  $\bar{\mu}$  is always well defined by Bayes Rule, because the benevolent secretary always provide public good.

The equilibrium is trivially free of collective action because the population insist a very low belief about the secretary's benevolence even though only benevolent secretary provides public good. It can be ruled out because the population reasons like this: only benevolent type is providing public good. So if the secretary perturbs their behavior a little bit and chooses {launch} with extremely small probability, I should know for sure that the secretary is benevolent if I saw someone leading a collective action. This is the case if the secretary "trembles hand" in the same manner regardless of his type. Note this is closely related to the idea of Sequential Equilibrium (Kreps, Wilson, 1982). Formally, we have a Perfect Bayesian Equilibrium that only benevolent secretary provides public good, both secretaries abstain from launching a collective action, and the population do not join any collective action. But suppose the equilibrium strategy is perturbed by a sequence of small

value  $\{\epsilon^n\} > 0$  with  $\lim_{n \rightarrow \infty} \epsilon^n = 0$ . Then Assumption 3 can be rationalized as:

$$\hat{\mu} = \lim_{n \rightarrow \infty} \frac{\mu(1 - \epsilon^n)\epsilon^n\pi}{\mu(1 - \epsilon^n)\epsilon^n\pi + (1 - \mu)(\epsilon^n)^2\pi} = \lim_{n \rightarrow \infty} \frac{\mu(1 - \epsilon^n)\pi}{\mu(1 - \epsilon^n)\pi + (1 - \mu)\epsilon^n\pi} = 1$$

Note that:

$$\bar{\mu} = \frac{\mu\pi}{\mu\pi + (1 - \mu) * 0 * \pi} = 1$$

So  $\hat{\mu} = \bar{\mu}$ . But this means that the population should join. Thus, above PBE does not satisfy Assumption 3.

Readers with more interest on how Assumption 3 works can consult the proofs of claim 2.1 in Proposition 2.

## 4.2 Characterizing Behaviors of Secretary and Population

In this section, I am going to characterize PBEs given  $W$  and  $k$ . In next section, I am going to discuss principal's optimal choice of  $W^*$  and  $k^*$ . As an overview, we will see that for  $k$  large enough, we will have a unique pure strategy equilibrium. Otherwise, we will have a unique mixed strategy equilibrium. But whatever equilibrium the principal wants to induce, he always faces an acute loyalty-competence tradeoff.

Let's first look at mixed strategy equilibria. I first introduce a few helpful lemmas.

### **Lemma 1**

*There is no PBE in which either normal or benevolent secretaries mix between {lead a collective action} and {not lead a collective action}.*

### **Proof:**

We first derive best response of all players for any history.

1. Normal secretary always capture all collective action benefits (denoted as {capture}); benevolent secretary always awards all collective action to the population (denoted as {award}).
2. Denote  $\hat{\mu}$  as population's belief that the population is facing a benevolent secretary after the secretary leads a collective action.

The population join the collective action (denoted as {join}) if  $\hat{\mu}(R + e - c) + (1 - \hat{\mu})(e - c) > e$ ,

or  $\hat{\mu}R > c$ ; will mix between {join} and {not join} if  $\hat{\mu}R = c$ ; will choose {not join} if  $\hat{\mu}R < c$ . Denotes the probability that the population choose {join} as  $\hat{y}$ .

3.1 Normal secretary will choose {launch a collective action} if  $(1 - \hat{y})(-k) + \hat{y}(Q + R - k) = \hat{y}(Q + R + S) - k > Q - k$ , or  $\hat{y} > \frac{Q}{Q + R + S}$ ; will mix between {launch} and {not launch} if  $\hat{y} = \frac{Q}{Q + R + S}$ ; will choose {not launch} if  $\hat{y} < \frac{Q}{Q + R + S}$ . Denote the probability that the normal secretary chooses {launch} as  $\hat{z}_1$ .

3.2 Benevolent secretary will choose {launch a collective action} if  $(1 - \hat{y})(\gamma e - k) + \hat{y}(Q + \gamma R + S + \gamma e - k) = \hat{y}(Q + \gamma R + S) + \gamma e - k > Q + \gamma e - k$ , or  $\hat{y} > \frac{Q}{Q + \gamma R + S}$ ; will mix between {launch} and {not launch} if  $\hat{y} = \frac{Q}{Q + \gamma R + S}$ ; will choose {not launch} if  $\hat{y} < \frac{Q}{Q + \gamma R + S}$ . Denote the probability that the normal secretary chooses {launch} as  $\hat{z}_2$ .

4.1 Normal secretary will choose {provide public good} if  $(1 - \pi)(Q - k) + \pi\{(1 - \hat{z}_1)(Q - k) + \hat{z}_1[(1 - \hat{y})(-k) + \hat{y}(Q + R + S - k)]\} > Q$ ; will mix between {provide} and {not provide} if  $(1 - \pi)(Q - k) + \pi\{(1 - \hat{z}_1)(Q - k) + \hat{z}_1[(1 - \hat{y})(-k) + \hat{y}(Q + R + S - k)]\} = Q$ ; will choose {not provide} if  $(1 - \pi)(Q - k) + \pi\{(1 - \hat{z}_1)(Q - k) + \hat{z}_1[(1 - \hat{y})(-k) + \hat{y}(Q + R + S - k)]\} < Q$ .

4.2 Denote  $b = \gamma e - k$ . Benevolent secretary will choose {provide public good} if  $(1 - \pi)(Q + b) + \pi\{(1 - \hat{z}_2)(Q + b) + \hat{z}_2[(1 - \hat{y})b + \hat{y}(Q + \gamma R + S + b)]\} > Q$ ; will mix between {provide} and {not provide} if  $(1 - \pi)(Q + b) + \pi\{(1 - \hat{z}_2)(Q + b) + \hat{z}_2[(1 - \hat{y})b + \hat{y}(Q + \gamma R + S + b)]\} = Q$ ; will choose {not provide} if  $(1 - \pi)(Q + b) + \pi\{(1 - \hat{z}_2)(Q + b) + \hat{z}_2[(1 - \hat{y})b + \hat{y}(Q + \gamma R + S + b)]\} < Q$ .

By contradiction, suppose  $z_1 \in (0, 1)$ . It must be the case that  $\hat{y} = \frac{Q}{Q + R + S}$ .

In this case, because  $\frac{Q}{Q + \gamma R + S} > \frac{Q}{Q + R + S}$ , benevolent secretary chooses  $z_2 = 1$ , or {launch a collective action}. The benevolent secretary will choose {provide public good} as  $(1 - \pi)(Q + b) + \pi\{[(1 - \hat{y})b + \hat{y}(Q + R + S + b)]\} = b + (1 - \pi)Q + \pi\frac{Q + R + S}{Q + \gamma R + S}Q > b + (1 - \pi)Q + \pi Q = b + Q > Q$ .

Thus, to make the population indifferent between {join} and {not join},  $x_1$  and  $z_1$  must satisfy  $\frac{\mu}{\mu + (1 - \mu)x_1 z_1}(R + e - c) + \frac{(1 - \mu)x_1 z_1}{\mu + (1 - \mu)x_1 z_1}(e - c) = e$ , or  $\hat{x}_1 \hat{z}_1 = \frac{\mu}{1 - \mu}(\frac{R}{c} - 1)$ . So  $\hat{x}_1 > 0$ . It must be the case that:  $(1 - \pi)(Q - k) + \pi\{(1 - \hat{z}_1)(Q - k) + \hat{z}_1[(1 - \hat{y})(-k) + \hat{y}(Q + R + S - k)]\} \geq Q$ , or  $\pi \hat{z}_1 \hat{y}(Q + R + S) \geq \pi \hat{z}_1 Q + k$ . Given that  $\hat{y} = \frac{Q}{Q + R + S}$ ,  $\pi \hat{z}_1 \hat{y}(Q + R + S) \geq \pi \hat{z}_1 Q + k$  reduces to  $0 \geq k$ , which is a contradiction. We conclude that it is impossible for normal secretary to mix between {launch a collective action} and {not launch}.

By contradiction, suppose  $z_2 \in (0, 1)$ . It must be the case that  $\hat{y} = \frac{Q}{Q + \gamma R + S}$ .



Because  $\frac{Q}{Q+\gamma R+S} < \frac{Q}{Q+R+S}$ , the normal secretary always choose {not launch}; consequently, he always choose {not provide public good}. So  $x_1 = z_1 = 0$ . Here the benevolent secretary has  $(1-\pi)(Q+b) + \pi\{(1-\hat{z}_2)(Q+b) + \hat{z}_2[(1-\hat{y})b + \hat{y}(Q+R+S+b)]\} = b + (1-\pi\hat{z}_2)Q + \pi\hat{z}_2\hat{y}(Q+R+S) = b + (1-\pi\hat{z}_2)Q + \pi\hat{z}_2Q = b + Q > Q$ . So benevolent secretary always choose {provide public good}. But then it is not optimal for the population to choose  $\hat{y} = \frac{Q}{Q+\gamma R+S}$ , given that only benevolent secretary provides public good and lead a collective action. They should choose  $\hat{y} = 1$ . We conclude that it is also impossible for benevolent secretary to mix between {launch} and {not launch}.

**Q.E.D.**

Lemma 1 allows me to simplify my analysis a lot. It rules out a major complication and induces my model to be consistent with canonical papers studying reputation effects. Next, I introduce two additional lemmas that are useful to prove uniqueness of PBE.

***Lemma 2 (Commitment of Benevolent Secretary)***

*In any PBE, benevolent secretary always provide public good.*

**Proof:**

By contradiction, benevolent secretary will not always provide public good if in a PBE, we have  $Q \leq (1-\pi)(Q+b) + \pi[(1-\hat{y})b + \hat{y}(Q+\gamma R+S+b)]$ .

1. Mixed strategy equilibrium where benevolent secretary mixes between {provide} and {not provide} is impossible.

By contradiction, it must be the case that  $Q = (1-\pi)(Q+b) + \pi[(1-\hat{y})b + \hat{y}(Q+\gamma R+S+b)]$ , or  $\hat{y} = \frac{\pi Q - b}{Q + \gamma R + S}$ . Note that normal secretary will not provide public good as:

$$(1-\pi)(Q-k) + \pi[(1-\hat{y})(-k) + \hat{y}(Q+R+S-k)] = (1-\pi)Q + \pi \frac{\pi Q - b}{Q + \gamma R + S} (Q + R + S) - k$$

$$< (1-\pi)Q + \pi Q - b - k = Q - b - k < Q$$

But given this, only benevolent secretary chooses {provide} with positive probability. This means that  $\hat{\mu} = 1$ , so the population should always join the collective action if the secretary launches one, or  $\hat{y} = 1$ . This is a contradiction.

2. Pure strategy equilibrium where benevolent secretary chooses {not provide} is not possible.

So  $Q < (1 - \pi)(Q + b) + \pi[(1 - \hat{y})b + \hat{y}(Q + \gamma R + S + b)]$ . The only case such inequality holds is  $\hat{y} = 0$ . So  $Q < (1 - \pi)Q + b$ .

2.1 Normal secretary provides public good with positive probability such that  $\hat{\mu} < \frac{c}{R}$ . Note that if  $\hat{\mu} > \frac{c}{R}$ , the population will deviate to {join the collective action}.

In this case, as  $\hat{\mu} < \frac{c}{R}$ , the normal secretary wants to deviate to  $x_1 = 0$ , or never provide public good. So it is not a possible PBE outcome.

2.2 Normal secretary does not provide public good.

In this case, benevolent secretary also does not provide public good, and he choose to not lead a collective action if he provides public good (otherwise it is not subgame optimal), and by assumption the population will not join if they observe public good provision. The benevolent secretary can get a higher payoff by deviating to provide public good.

**Q.E.D.**

Lemma 2 formalize the idea that benevolent secretary is the “commitment type”: benevolent secretary is committed to provide public good. This reduces number of possible strategies we need to rule out for equilibrium uniqueness. I prove an additional lemma to further reduces the space of possible strategies we need to check.

***Lemma 3 (Impossible Strategies)***

*The following strategy will not appear in any PBE: 1. {provide} and {not lead} for normal secretary; 2. population chooses {not join} while secretary chooses {launch}; 3. population chooses {join} while secretary chooses {not launch}*

**Proof:**

If the secretary chooses {provide} and {not lead}, given that benevolent secretary always provide public good, the best response of benevolent secretary is to choose {lead}. Given this,  $\hat{\mu} = 1$ , and the population must join. The governor can get a higher payoff by deviating to {lead}.

“Population chooses {not join} while secretary chooses {launch}” and “population chooses {join} while secretary chooses {not launch}” do not satisfy sequential rationality for both benevolent and normal secretaries.

**Q.E.D.**

I analyze mixed strategy equilibrium first:

**Lemma 4**

If  $k < \pi(R + S)$ , then only mixed equilibrium exists and it is unique. The normal secretary mixes between providing public good and not, and the population mixes between joining the collective action and not.

Denote that the normal secretary provides public good with probability  $\hat{x}$ ; the population chooses {join} with probability  $\hat{y}$ . We have:

$$\hat{x} = \frac{\mu}{1 - \mu} \left( \frac{R}{c} - 1 \right) = \frac{\mu}{1 - \mu} \left\{ \frac{(1 - \lambda)W}{c} - 1 \right\}$$

$$\hat{y} = \frac{Q + \frac{k}{\pi}}{Q + R + S} = \frac{\lambda W + \frac{k}{\pi}}{W + S}$$

And the secretary chooses {launch} after providing public good.

**Proof:**

1. Use indifference principle to derive  $\hat{x}$  and  $\hat{y}$ , assuming that the secretary always {launch}.

To make the population indifferent between joining and not joining, the normal secretary must choose  $\hat{x}$  so that:

$$\frac{\mu}{\mu + (1 - \mu)\hat{x}}(e + R - c) + \frac{(1 - \mu)\hat{x}}{\mu + (1 - \mu)\hat{x}}(e - c) = e$$

Solve the equation, we get:

$$\hat{x} = \frac{\mu}{1 - \mu} \left( \frac{R}{c} - 1 \right) = \frac{\mu}{1 - \mu} \left\{ \frac{(1 - \lambda)W}{c} - 1 \right\}$$

To make the normal secretary indifferent between providing public good and not providing, the population must choose  $\hat{y}$  so that:

$$(1 - \pi)(Q - k) + \pi[\hat{y}(Q + R + S - k) + (1 - \hat{y})(-k)] = Q$$

Solve the equation, we get:

$$\hat{y} = \frac{Q + \frac{k}{\pi}}{Q + R + S} = \frac{\lambda W + \frac{k}{\pi}}{W + S}$$

2. Verify that normal secretary wants to lead a collective action given  $\hat{y}$ :

$$\hat{y}(Q + R + S - k) + (1 - \hat{y})(-k) = Q + \frac{1 - \pi}{\pi}k \geq Q - k$$

Verify that benevolent secretary wants to lead a collective action given  $\hat{y}$ :

$$\hat{y}(\gamma Q + R + S + e - k) + (1 - \hat{y})(e - k) \geq \gamma Q + e - k$$

It reduces to:

$$\frac{Q + \frac{k}{\pi}}{Q + R + S} \geq \frac{Q}{Q + \gamma R + S}$$

which is true for  $\gamma \geq 1$ .

Note that the benevolent secretary wants to provide public good given  $\hat{y}$ :

$$(1 - \pi)[Q + e - k] + \pi[\hat{y}(Q + \gamma R + S + e - k) + (1 - \hat{y})(e - k)] \geq Q + e - k > \gamma Q$$

Note that the mixed strategy equilibrium trivially satisfies Assumption as it does not involve off-equilibrium belief.

To check uniqueness, note that it is never optimal for both types to not provide public good and then lead a collective action. If the other type also does not provide public good, then by Assumption 1 the population will not join; if the other type provide public good, the population will join the collective action launched by secretary who does not provide public good if only benevolent secretary does not do so and normal secretary provides. The situation is ruled out by Assumption 2.

1.

{provide, not provide, launch, launch, join} is not a PBE. The normal secretary want to deviate

to {provide}:

$$Q < (1 - \pi)(Q - k) + \pi(Q + R + S - k)$$

2.

{provide, not provide, not launch, not launch, not join} is a (family of) equilibrium supported by  $\hat{\mu} \in [0, \frac{c}{R}]$ . Note that no one can single deviate and get a strictly higher payoff, *given the off-equilibrium belief that  $\hat{\mu} \in [0, \frac{c}{R}]$ .*

But note that it does not satisfies Assumption 3:

$$\bar{\mu} = \frac{\mu\pi}{\mu\pi} = 1$$

Assumption 3 restricts that  $\hat{\mu} = \bar{\mu} = 1$ . In this case, above strategies is not a PBE because the population want to deviate.

3.

{provide, provide, launch, launch, join} is not a PBE by Assumption 1.

All other pure PBE has been ruled out by Lemmas 1-3.

**Q.E.D.**

***Proposition 1 (Loyalty-competence tradeoff in Mixed-strategy Equilibrium)***

*If  $k < \pi(R + S)$ , the probability of collective action is:*

$$Pr(\text{collective action}) = \mu \frac{R}{Q + R + S} \frac{\pi Q + k}{c} = \mu \frac{(1 - \lambda)W}{W + S} \frac{\pi W + k}{c}$$

*Specifically,  $Pr(\text{collective action})$  increases with competence  $W$ . It also increases with  $k$ ,  $\mu$ ,  $\pi$ , and decreases with  $c$ .*

**Proof:**

$$Pr(\text{collective action}) = (1 - \mu)x^*y^*\pi + \mu y^*\pi$$

$$\begin{aligned}
&= \{(1 - \mu)\left\{\frac{\mu}{1 - \mu}\left[\frac{(1 - \lambda)W(a)}{c} - 1\right]\right\} + \mu\} \frac{Q + \frac{k}{\pi}}{Q + R + S} \pi \\
&= \frac{R}{Q + R + S} \frac{\pi Q + k}{c} = \mu \frac{(1 - \lambda)W}{W + S} \frac{\pi W + k}{c}
\end{aligned}$$

**Q.E.D.**

Proposition 1 formalizes the competence-loyalty trade-off in mixed strategy equilibrium. A more competent secretary produces more economic surplus for the principal; but at the same time, he is also more likely to launch a collective action. There are two mechanisms: with a more competent secretary, the secretary and the population finds it more attractive to organize collective action, since the return is high. This is formalized by the term  $\frac{(1-\lambda)W}{W+S}$ . Meanwhile, a more competent secretary has more to lose if the collective action fails. As a consequence, the public good signal is more costly for more competent secretary. This strengthens the informativeness of the signal, as normal and competent secretary is less likely to provide public good and lead a collective action.

Next, let us turn to pure strategy equilibrium:

***Proposition 1 (Loyalty-competence Tradeoff in Pure-strategy Equilibrium)***

*If  $k \geq \pi(R + S)$ , then only pure strategy equilibrium exists.*

***1.1 Collective action risk in equilibrium***

*If  $R > c$ , then in the unique PBE, {provide public good, not provide, lead, lead, join} is the strategy profile.*

***1.2 No collective action risk in equilibrium with low competence***

*If  $R \leq c$ , then in the unique PBE, {provide, not provide, not lead, not lead, not join} is the strategy profile.*

**Proof:**

Denote  $\{\cdot, \cdot, \cdot, \cdot, \cdot\}$  as the strategy profile of benevolent secretary and normal secretary in choosing public good provision, leading a collective action, and the population in joining the collective action.

Assume that  $R > c$ .

It is easy to see that  $\{\text{provide public good, not provide, launch, launch, join}\}$  is a PBE supported by the belief of the population  $\hat{\mu} = 1$ . In this case, the population want to join. The benevolent secretary wants to provide public good as:

$$(1 - \pi)(Q + \gamma e(k) - k) + \pi(Q + \gamma R + S + \gamma e(k) - k) > (1 - \pi)Q + \pi(Q + \gamma R + S)$$

And the normal secretary do not want to provide because:

$$Q \geq (1 - \pi)(Q - k) + \pi(Q + R + S - k)$$

by assumption  $k \geq \pi(R + S)$ . Given the strategy profiles, it is optimal for both secretaries to  $\{\text{launch}\}$  a collective action after providing public good. But because the normal secretary does not provide public good, it is a off-equilibrium strategy for him.

Note that the PBE trivially satisfies Assumption 3 because there is no off-equilibrium belief at  $\{\text{launch}\}$  and  $\{\text{not launch}\}$ .

1.

$\{\text{provide, not provide, not launch, not launch, not join}\}$  is a (family of) equilibrium supported by  $\hat{\mu} \in [0, \frac{c}{R})$ . Note that no one can single deviate and get a strictly higher payoff, *given the off-equilibrium belief that  $\hat{\mu} \in [0, \frac{c}{R})$ .*

But it does not satisfies Assumption 3:

$$\bar{\mu} = \frac{\mu\pi}{\mu\pi} = 1$$

Assumption 3 restricts that  $\hat{\mu} = \bar{\mu} = 1$ . In this case, above strategies is not a PBE because the population want to deviate.

2.

$\{\text{provide, provide, launch, launch, join}\}$  is not a PBE:  $\hat{\mu} = \mu$ , so the population want to deviate

to {not join}.

All other pure PBE are ruled out by Lemmas 1-3.

Rule out mixed strategy equilibrium:

The benevolent secretary is “committed” to provide public good, and it is impossible to mix between {launch} and {not launch}. Thus, the only possible mixed strategy equilibrium involves the normal secretary to mix between providing and not providing, and the population mixes between join and not join the collective action (if they observe public good). Denote the probability of joining the collective action as  $y \in (0, 1)$ .

It is profitable for the normal secretary to deviate to not provide public good deterministically, so there is no mixed strategy equilibrium:

$$(1 - \pi)(Q - k) + \pi[y(Q + R + S - k) + (1 - y)(-k)] < (1 - \pi)(Q - k) + \pi(Q + R + S - k) < Q$$

Assume that  $R \leq c$ .

Now the population never find it optimal to join the collective action. Consequently, only the benevolent secretary provides public good and the normal one not. There is no collective action in equilibrium.

**Q.E.D.**

Proposition 2 says that if principal chooses a high degree of decentralization, then there are two possible outcomes. In the first one, the benevolent secretary fully reveals his identity through public good provision, and the population join collective action. In the second outcome, the competence of the secretary is so low that the population finds it undesirable to join, which eliminates all collective action risk. The second case of loyalty-competence tradeoff emerges here: the principal can eliminate collective action by choosing a very low competence  $(1 - \lambda)WR = c$ . If he chooses any competence such that  $R > c$ , he will face a risk of collective action with probability  $\mu\pi$ . Obviously, because the risk is constant at  $\mu\pi$ , the principal will chooses  $\bar{R} = (1 - \lambda)\bar{W}$  if  $(1 - \mu)\bar{R} \geq c$  and  $R = c$  otherwise. Thus, the principal faces either a competent but disloyal secretary or a loyal but mediocre one.



### 4.3 Principal's Problem

Given our analysis before, the principal's problem is:

$$\max_{W, k} 1\{k < \pi((1 - \lambda)W + S)\} \max\left\{1 - \mu \frac{(1 - \lambda)W}{W + S} \frac{\pi\lambda W + k}{c}\right\} [(1 - \lambda)W + S], c + S\}$$

$$+ 1\{k \geq \pi((1 - \lambda)W + S)\} \max\{(1 - \mu)W + S, c + S\}$$

Intuitively speaking, the principal should avoid the case where the benevolent secretary fully reveals his identity and the population gain full confidence to join collective action. This is formalized by Assumption 1, with which I can prove Proposition 3 that rules out the pure strategy equilibrium with high competence and high collective action risk:

***Proposition 3 (Implementation of Mixed Equilibrium with Loyalty-competence Tradeoff)***

*The principal wants to implement the mixed strategy equilibrium;  $k^* = 0$ , and optimal competence is interior solution.*

**Proof:**

If  $\lambda R \leq c$ , then  $\text{Prob}(\text{collective action}|\text{mixed equilibrium}) = \mu \frac{Q}{Q+R+S} \frac{\pi R}{c} < \mu \pi \frac{\lambda R}{c} < \mu \pi = \text{Prob}(\text{collective action}|\text{pure equilibrium})$ . The probability of collective action under mixed strategy equilibrium is lower than that under pure strategy equilibrium, whatever the competence of secretary. Thus, the principal is guaranteed to get a higher payoff by choosing the mixed strategy equilibrium.

The problem then reduces to

$$\max_{W, k} \left\{1 - \mu \frac{(1 - \lambda)W}{W + S} \frac{\pi\lambda W + k}{c}\right\} [(1 - \lambda)W + S]$$

Obviously, the optimal solution to  $k$  is  $k^* = 0$ .

For  $W$ , the first order condition is:

$$(1 - \lambda)\left[1 - \mu \frac{(1 - \lambda)W}{W + S} \frac{\pi\lambda W + k}{c}\right] + \left[-\mu \frac{(1 - \lambda)S}{(W + S)^2} \frac{\pi\lambda W + k}{c} - \mu \frac{(1 - \lambda)W}{W + S} \frac{\pi\lambda}{c}\right][(1 - \lambda)W + S] = 0$$

To make sure that the solution to first order condition is globally optimal, we need to check second order condition and make sure that:

$$2(1 - \lambda)\left[-\mu \frac{(1 - \lambda)S}{(W + S)^2} \frac{\pi\lambda W + k}{c} - \mu \frac{(1 - \lambda)W}{W + S} \frac{\pi\lambda}{c}\right] + 2\left[\frac{\mu(1 - \lambda)S}{(W + S)^3} \frac{\pi\lambda W + k}{c} - \mu \frac{(1 - \lambda)S}{(W + S)^2} \frac{\pi\lambda}{c}\right] < 0$$

which will be true if:

$$\frac{\mu(1 - \lambda)S}{(W + S)^3} \frac{\pi\lambda W + k}{c} - \mu \frac{(1 - \lambda)S}{(W + S)^2} < 0$$

which reduces to:

$$k \leq \pi\lambda S$$

As  $k^* = 0$  and  $S > 0$ . It is always true.

Manually check for the case  $S = 0$ . We will see that it is a quadratic problem with positive linear term and negative quadratic term; so global optimal solution exists and is also interior.

**Q.E.D.**

$k^* = 0$  shows strong incentive to centralize spending, but it looks unrealistic as some public good can only be provided by local authority. I am going to deal with this issue in next section. Thus, the principal wants to induce a mixed strategy equilibrium, centralize public spending, and still faces a strong loyalty-competence tradeoff. Under concentration of powers, the secretary has full incentive to promote political mediocrity and expenditure centralization.

## 4.4 Public good as Co-optation against Mass Revolution

In prior analysis, public good does not have intrinsic value to the principal. The principal strategically chooses locality's discretion over public good strategically to minimize collective action risk. That is why  $k^* = 0$ . But it looks unrealistic as some public good has to be provided locally. In this section, I assume that the population can engage in revolution without the leadership of local politicians. I call such revolt "mass revolution". In this case, the principal has to grant some decision discretion to local politicians even under concentration of powers. Only in this case can local politicians co-opt the population and induce them from abstaining revolution. We will see that a regime with concentration of powers features high risk of collective actions from both the population and secretary. The reason is that the leadership only grants some spending discretion to the local secretary. Otherwise, local secretary's signaling device will be too powerful. But this means that it is more difficult to induce local population to abstain mass revolution. At the same time, even partial spending discretion strengthens informativeness of signal, which increases risk of collective action from secretary.

The model only changes a little bit. Before the signaling stage, with probability  $\nu$  the population solves their collective action problem and they can engage in a mass revolution. If the population succeed in mass revolution, they will deprive all benefit enjoyed by both the principal and the secretary. The probability that the population will accept the public good from the local authority and abstain mass revolution is  $\sigma(k)$ , and  $\sigma(\cdot)$  has  $\sigma'(\cdot) > 0$ , " $\sigma''(\cdot) < 0$ " and  $\lim_{k \rightarrow 0} \sigma'(k) \rightarrow \infty$ . Everything else is the same.  $\sigma'(\cdot) > 0$ , " $\sigma''(\cdot) < 0$ " captures the intuition that the population are more likely to abstain mass revolution with more lavish public good.

Suppose the principal wants to implement the mixed strategy equilibrium under concentration of powers. The principal's problem:

$$\begin{aligned} & \max_{a,k} (1 - \nu) \left\{ 1 - \mu \frac{(1 - \lambda)W}{W + S} \frac{\pi \lambda W + k}{c} \right\} [(1 - \lambda)W + S] + \nu \sigma(k) [(1 - \lambda)W + S] \\ & = \max_{a,k} \left\{ (1 - \nu) \left\{ 1 - \mu \frac{(1 - \lambda)W}{W + S} \frac{\pi \lambda W + k}{c} \right\} + \nu \sigma(k) \right\} [(1 - \lambda)W + S] \end{aligned}$$

We can prove that:

**Proposition 4**

*With concentration of powers, the optimal spending discretion is:*

$$\sigma'(k) = \frac{1 - \nu \mu}{\nu} \frac{\mu}{c}$$

*Specifically,  $k > 0$  and it increases with  $\nu$  and  $c$ , decreases with  $\mu$ . The optimal competence is an interior solution.*

We can see that the tension between competence and loyalty is magnified if public good can be used to preempt a mass revolution. Specifically, with a positive  $k$ , it is easier for the secretary to signal his benevolence; because of this concern, central authority cannot grant full discretion over public spending to the secretary. But this makes it difficult for the secretary to induce the population to abstain from collective action. Thus, under concentration of powers, the principal faces risk from both the secretary and the population.

## 5. Delegation, Decentralization, and Political Meritocracy

In this section, I adopt the signaling model I analyzed extensively in section 4. I add a fourth player, the governor, who is in charge of fiscal decision. We will see that the addition of the new player dramatically change the equilibrium outcome. I will get a very sharp prediction that central authority unambiguously pushes for decentralization and political meritocracy simultaneously.

### 5.1 Setup

We have four players. The principal, the provincial secretary, the population, and the governor. The timing of the game is very similar:

**1. Appointment stage:** The central authority chooses the competence of secretary and governor, who jointly produce a surplus of  $W$ .

The central authority also chooses the degree of decentralization  $e$ , which measures how much public good can be provided by local authority.

The nature determines whether the secretary and the governor are normal or benevolent (both with probability  $\mu$  and independently distributed). If the secretary does not launch a collective action, status-quo payoff to a secretary and a governor is both  $Q \equiv \lambda W$ ,  $0 < \lambda < 1$ . Payoff to principal is  $R + S \equiv (1 - 2\lambda)W + S$  and payoff to population is normalized to 0.  $S$  is the exogenous rent of being the autocrat.

**2. Collusion stage:** The secretary can make a credible promise to transfer a fraction of collective action benefit  $\eta R$  to the governor in the case that collective action succeeds. The transfer is a compensation to the governor's effort to provide public good in next stage. The side contract is offered by the secretary. I assume that when the secretary propose  $\eta R$ , it will always be awarded to the governor regardless of governor's type in the event of a successful collective action. As we will see, the governor's only choice variable is to provide the public good or not; he cannot reject the proposal made by the secretary. Of course, this does not mean that governor has no bargaining power: if the secretary does not provide sufficient compensation, the governor may just refuse to provide public good. Finally, the collusion behavior is not observable to the population. This is not a critical assumption but it fits reality nicely.

If I do not allow collusion opportunity for local politicians, then the main proposition of the paper is trivial to prove. But even with fully credible collusion, we will see that collective action risk still decreases dramatically.

**3. Signaling stage:** Instead of secretary, it is governor who decides whether to provide public good  $e(k)$  which costs  $k$ ; the population values the public good as  $e(k)$ . Now the governor bears the whole cost of public good provision  $k$ . As Shirk, (1992, 1993) and Guo, (2009) note, the governor is in charge of economic policy and everyday management of the administration.

**4. Mobilization stage:** The nature decides whether there is a chance for collective action with probability  $\pi$ . If there is no chance, the normal secretary's payoff is  $Q$ , the population get  $e(k)$ , and the governor get  $Q - k$ . For a benevolent secretary, the payoff is  $e(k) + Q$ , and for a benevolent governor, it is  $e(k) - k + Q$ .

The secretary decides whether to lead a collective action; the population decides whether to join with a cost of  $c$ .

If the secretary launches a collective action, and the population do not join, the normal secretary will get 0 and the normal governor will get  $Q - k$ . The benevolent secretary will get  $e(k)$  and the benevolent governor will get  $Q + e(k) - k$ . Note that status-quo payoffs for secretary are lost because the principal sacks the secretary; but the principal will not sack governor if the secretary launches a failed collective action. The assumption tracks reality very well. In the three major episodes when provincial secretaries tried to challenge central authority (Chen Xitong, Chen Liangyu, Bo Xilai), the secretaries were severely punished, but all three governors retained there positions.

In line with Lemma 1, I am going to assume that {launch} or {not launch} must be pure strategies. The assumption is not necessary for my results. An appendix is going to deal with the situation where the secretary can mix between {launch} and {not launch}. But such mixed strategy equilibrium greatly complicates my analysis and needs many discussions to clarify my results.

**5. Divide the pie:** Whoever leads the collective action will distribute its benefit, so the secretary will decide whether to award the benefit  $(1 - \eta)R$  to the population. The normal secretary gets  $(1 - \eta)R + Q + S$  if he capture all benefits, and gets  $Q + S$  if he awards  $(1 - \eta)R$  to the population. The benevolent secretary gets  $(1 - \eta)R + Q + S + e(k)$  if he captures all benefits, and gets  $Q + \gamma(1 - \eta)R + S + e(k)$  if he awards  $R$  to the population.

From setup, we can see the key tension brought by delegation. The population wants to join the collective action launched by a benevolent secretary but not a normal one. However, the signaling device is in the hands of governor rather than secretary. Thus, public good provision is not very informative regarding the benevolence of secretary. We will see that in equilibrium, the population learn nothing from public good provision about secretary. This completely forestalls collective action and enables central authority to decentralize spending and appoint the most competent local

politicians.

## 5.2 Characterizing Behaviors of Population And Local Politicians

This section is in parallel with section 3.2. We will see that there is a cutoff of  $k$  above which we have pure strategy equilibrium, and below another cutoff we have mixed strategy equilibrium. we will see that for any value of  $k$ , delegation always reduce collective action risk vis-a-vis concentration of powers, which improves political meritocracy.

### *Lemma 5 (Commitment of Benevolent Governor)*

*In any PBE, benevolent secretary always provide public good.*

#### **Proof:**

Note that if both secretaries lead collective action:

$$(1 - \pi)(Q + b) + \pi[(1 - \hat{y})(Q + b) + \hat{y}(Q + \eta R + b)] > Q$$

If only benevolent secretary lead collective action:

$$(1 - \pi)(Q + b) + \pi\{(1 - \mu)(Q + b) + \mu[(1 - \hat{y})(Q + b) + \hat{y}(Q + \eta R + b)]\} > Q$$

If only normal secretary lead collective action:

$$(1 - \pi)(Q + b) + \pi\{\mu(Q + b) + (1 - \mu)[(1 - \hat{y})(Q + b) + \hat{y}(Q + \eta R + b)]\} > Q$$

So the benevolent governor always provide public good.

**Q.E.D.**

### *Proposition 5 (No Collective Action Risk in Pure Strategy Equilibrium)*

*If  $k \geq \pi R$ , then in any pure strategy equilibrium, the benevolent governor always provide public good, while the normal governor not. The secretary never initiates a collective action, and the central authority appoints the most competent secretary and governor.*

**Proof:**

$\{\cdot, \cdot; \cdot, \cdot; \cdot\}$  denotes the strategy profile of benevolent and normal governors in providing public good, benevolent and normal secretaries in launching a collective action, and the population if they observe public good provision. Note that with  $k \geq \pi R$ , we have:

$$(1 - \pi)(Q - k) + \pi(\eta R + Q - k) \leq Q$$

So it doesn't matter whether the secretaries propose or not.

1. In the (family of ) PBE {provide, not provide, not launch, not launch, not join} with  $\hat{\mu} = \bar{\mu} = \frac{\mu^* \mu^* \pi}{\mu^* \pi} = \mu$  (Assumption 3), the benevolent governor has no incentive to deviate:

$$Q + \gamma e(k) - k > Q$$

The normal governor has no incentive to deviate:

$$Q \geq (1 - \pi)(Q - k) + \pi(\eta R + Q - k)$$

Both secretaries have no incentive to deviate as  $Q > 0$ .

The population has no incentive to deviate given their belief  $\hat{\mu} = \mu$ .

2.

{provide, not provide, launch, launch, join} is not a PBE. The normal secretaries want to deviate to {provide}:

$$Q < (1 - \pi)(Q - k) + \pi(Q + R + S - k)$$

3

{provide, provide, launch, launch, join} is not a PBE by Assumption 1.

4.

{provide, provide, launch, launch, join} is not a PBE. Normal governor wants to deviate to {not provide}.



All other PBEs are ruled out by Lemmas 3 and 5.

5. There is no mixed strategy equilibrium where the secretary mixes between {propose} (with probability  $x$ ) and {not propose}, the normal governor provide only if the secretary propose, and the population mixes between {join} (with probability  $y$ ) and {not join}. Note this is the only possible mixed strategy equilibrium. But the equilibrium is forestalled because the normal governor finds it undesirable to provide public good:

$$(1 - \pi)(Q - k) + \pi[y(\eta R + Q - k) + (1 - y)(Q - k)] < Q - k + \pi\eta R \leq Q$$

for any  $y \in [0, 1]$ .

**Q.E.D.**

Proposition 5 is the key result of this paper. It says that with sufficient high decentralization, delegation will completely forestall collective action. The intuition is that normal governor finds it too costly to provide public good for signaling purpose with high degree of decentralization. This leaves only benevolent governor to provide public good, which reveals full information about the benevolence of governor. But it tells the population nothing about the benevolence of secretary. Yet the population wants to learn about the secretary rather than the governor, because it will be the secretary who lead the collective action and distribute associated benefit. Consequently, the population refuse to join any collective action. As collective action is completely forestalled, the central authority will decentralize spending and appoint the most competent secretary and governor. This is the full force of economic delegation at work. The secretary has the mean to mobilize and organize the population through extensive party organizations and propaganda apparatus, but he cannot communicate with the population because economic power lies with the governor.

***Lemma 6***

1. If  $k \leq \frac{\pi Q[R - (2 - \mu)c]}{Q + S + (2 - \mu)c}$ , then there are two equilibrium outcomes.

1.1 A mixed equilibrium exists where the secretary mixes between proposing public good and not, and the population mixes between joining the collective action and not. The normal governor

provides public good only if secretary promises a transfer, and the benevolent governor always provide public good.

Denote that the normal secretary provides public good with probability  $x$ ; the population chooses {join} with probability  $y$ . We have:

$$\hat{x} = \frac{\mu}{(1-\mu)^2} \left( \frac{(1-\eta^*)R}{c} - 2 + \mu \right) = \frac{\mu}{1-\mu} \left\{ \frac{(1-\lambda)(1-\eta^*)W(a)}{c} - 1 \right\}$$

$$\hat{y} = \frac{Q}{Q + (1-\eta^*)R + S} = \frac{\lambda W(a)}{[\lambda + (1-\hat{\eta})(1-\lambda)]W(a) + S}$$

$\hat{\eta}$  satisfies that:

$$\hat{\eta}R = \frac{k(Q + R + S)}{\pi Q + k}$$

Specifically,  $\hat{\eta}R$  increases with  $k$ .

And the secretary chooses {launch} after governor provides public good.

1.2 A pure strategy equilibrium exists, where both normal and benevolent secretaries do not propose, only benevolent governor provides public good, and population do not join collective action.

2. With  $\frac{\pi Q[R-(2-\mu)c]}{Q+S+(2-\mu)c} < k < \pi R$ , only above pure strategy equilibrium exists.

**Proof:**

The proof for  $\hat{x}$  and  $\hat{y}$  is similar to Lemma 4. Assume that the benevolent secretary always propose.

$\hat{x}$  has to satisfy:

$$\frac{\mu^2 + (1-\mu)\mu}{\mu + (1-\mu)(\mu + (1-\mu)\hat{x})} (1-\eta)R = c$$

And  $\hat{y}$  has to satisfy:

$$Q = (1-\pi)Q + \pi[(1-\hat{y}) * 0 + \hat{y}(Q + (1-\hat{\eta})R + S)]$$

Solve for  $\hat{x}$  and  $\hat{y}$ , we have  $\hat{x} = \frac{\mu}{(1-\mu)^2} \left( \frac{(1-\hat{\eta})R}{c} - 2 + \mu \right)$  and  $\hat{y} = \frac{Q}{Q+(1-\hat{\eta})R+S}$ .

Note that benevolent secretary does always propose:

$$(1 - \pi)Q + \pi[\hat{y}(Q + (1 - \hat{\eta})\gamma R + S)] > (1 - \pi)Q + \pi Q = Q$$

$\hat{\eta}$  has to make sure that normal governor find it more desirable to provide public good:

$$(1 - \pi)(Q - k) + \pi[\hat{y}(Q + \eta R - k) + (1 - \hat{y})(Q - k)] \geq Q$$

With  $\hat{y} = \frac{Q}{Q + (1 - \hat{\eta})R + S}$ , rearrange the inequality:

$$\hat{\eta}R = \frac{k(Q + R + S)}{\pi Q + k}$$

$\hat{\eta} \leq 1$  if and only if:

$$\frac{k(Q + R + S)}{(\pi Q + k)R} \leq 1$$

$$k \leq \frac{Q}{Q + S}\pi R$$

Note that we also need to make sure that  $\hat{x}, \hat{y} \in [0, 1]$ . It is trivial for  $\hat{y}$ . For  $\hat{x} \leq 1$ , we need  $\frac{\mu}{(1 - \mu)^2} \left( \frac{(1 - \eta^*)R}{c} - 2 + \mu \right) < 1$ , or  $\mu(1 - \eta^*)R \leq c$ , which is true for any  $\eta^*$  with Assumption 1  $\mu R < c$ .

For  $\hat{x} \geq 0$ , we need  $\frac{(1 - \eta^*)R}{c} - 2 + \mu > 0$ , or  $(1 - \eta^*)R \geq (2 - \mu)c$ . So  $\eta^* \leq 1 - \frac{(2 - \mu)c}{R}$ . Note that  $1 - \frac{(2 - \mu)c}{R} \geq 0$ , as it requires  $R \geq (2 - \mu)c$ . As  $2c - \mu c < 2c - R$ , it suffices to show that  $R > 2c - R$ , which reduces to  $R > c$ . Note it is trivial that  $1 - \frac{(2 - \mu)c}{R} < 1$ , so between  $\hat{\eta} \leq 1$  and  $\hat{\eta} \leq 1 - \frac{(2 - \mu)c}{R}$ , the later is binding.

So  $\frac{k(Q + R + S)}{(\pi Q + k)R} \leq 1 - \frac{(2 - \mu)c}{R}$ , which reduces to  $k \leq \frac{\pi Q[R - (2 - \mu)c]}{Q + S + (2 - \mu)c}$ .

Note that the PBE passes Assumption 3 trivially. The proof of uniqueness is similar as Lemma 4.

Now assume that benevolent secretary does not propose. Note that the normal secretary also has no incentive to propose. If he does so, the best outcome he can expect is that the updated belief

of population is  $\frac{\mu^2}{\mu+(1-\mu)(1-\mu)}$ , which is smaller than  $\mu$ . Assume that normal governor provides with probability  $\hat{v}$ .

1. Suppose both normal and benevolent secretaries abstain. Evoke Assumption 3, we have

$$\hat{\mu} = \frac{[\mu + (1 - \mu)\hat{v}]\mu\pi}{[\mu + (1 - \mu)\hat{v}]\pi} = \mu$$

So population do not join. Given this, indeed normal and benevolent secretaries abstain, and  $\hat{v} = 0$ .

2. Suppose benevolent secretary lead, and normal secretary abstain. Then  $\hat{\mu} = \frac{[\mu+(1-\mu)\hat{v}]\mu\pi}{[\mu+(1-\mu)\hat{v}]\mu\pi} = 1$ . The population want to join, and the normal secretary wants to deviate and lead. A contradiction.

3. Suppose benevolent secretary abstain, and normal secretary lead. Then  $\hat{\mu} = \frac{[\mu+(1-\mu)\hat{v}]\pi*0}{[\mu+(1-\mu)\hat{v}](1-\mu)\pi} = 0$ . The population abstain, and the normal secretary wants to deviate and abstain.

4. Suppose both benevolent and normal secretaries lead. Then  $\hat{\mu} = \frac{[\mu+(1-\mu)\hat{v}]\mu\pi}{[\mu+(1-\mu)\hat{v}]\pi} = \mu$ . The population want to abstain, and both normal and benevolent secretary want to deviate and abstain.

The claim is established.

For the case  $\frac{\pi Q[R-(2-\mu)c]}{Q+S+(2-\mu)c} < k < \pi R$ , note that the mixed strategy equilibrium is not feasible. The proof for the pure strategy equilibrium is exactly the same as before.

**Q.E.D.**

I am going to focus on the risky equilibrium. From Lemma 6, we can prove Proposition 6:

**Proposition 6 (Reduced Collective Action Risk in Mixed Strategy Equilibrium)**

If  $k \leq \frac{\pi Q[R-(2-\mu)c]}{Q+S+(2-\mu)c}$ , the probability of collective action is:

$$Pr(\text{collective action}) = \mu \frac{(1 - \hat{\eta})R}{c} \frac{\pi Q}{Q + (1 - \hat{\eta})R + S} = \mu \frac{(1 - \hat{\eta})(1 - 2\lambda)W}{(\lambda + (1 - \hat{\eta})(1 - 2\lambda))W + S} \frac{\pi \lambda W}{c}$$

Specifically, with the same level of competence, the probability of collective action under delegation is lower than that under concentration of powers:

$$Pr(\text{collective action}|\text{delegation}) = \mu \frac{(1 - \hat{\eta})(1 - 2\lambda)W}{(\lambda + (1 - \hat{\eta})(1 - 2\lambda))W + S} \frac{\pi \lambda W}{c}$$

$$< \mu \frac{(1-\lambda)W}{W+S} \frac{\pi\lambda W + k}{c} = Pr(\text{collective action}|\text{concentration})$$

And  $Pr(\text{collective action})$  is a decreasing function of  $k$ .

**Proof:**

The key is that  $\frac{(1-\hat{\eta})(1-2\lambda)W}{(\lambda+(1-\hat{\eta})(1-2\lambda))W+S} < \frac{(1-\lambda)W}{W+S}$  for  $\hat{\eta} \in [0, 1]$ .

Q.E.D.

So the result is robust even if principal does not have the flexibility to choose  $k$ . There are two channels. Firstly, the governor has to be compensated by a fraction of benefit, which lowers the return from collective action for secretary and population.

Secondly,  $k$  “disappears” in  $Pr(\text{collective action}|\text{delegation})$  (of course, it does not really disappear as the optimal threshold  $\hat{\eta}$  still depends on  $k$ ). Specifically, it appears in the term  $\frac{\pi\lambda W+k}{c}$  without delegation, but the term becomes  $\frac{\pi\lambda W}{c}$  under delegation. This is where delegation is at work again. Public good provision is an informative signal without delegation because it is costly for the secretary to provide. Under delegation, the governor controls public good and henceforth bears the full cost of public good provision. This makes public good very cheap for the secretary, as he does not generate effort to provide it. But we know that a cheap signal is not informative, which makes population much less convinced about the benevolence of secretary. Consequently, population are less willing to join collective action.

### 5.3 Principal’s Problem under Delegation

The principal’s problem is:

$$\max_{W, k} 1\left\{k \leq \frac{\pi Q[R - (2 - \mu)c]}{Q + S + (2 - \mu)c}, \right\} \max\left\{1 - \mu \frac{(1 - \lambda)(1 - \eta^*)W}{(\lambda + (1 - \eta^*)(1 - 2\lambda))W + S} \frac{\pi\lambda W}{c}\right\}$$

$$[(1 - 2\lambda)W(a) + S], c\} + 1\{k \geq \frac{\pi Q[R - (2 - \mu)c]}{Q + S + (2 - \mu)c}, \}W$$

The solution is quite straightforward. The principal cannot do better than choosing  $k^* \geq \frac{\pi Q[R - (2 - \mu)c]}{Q + S + (2 - \mu)c}$ , and  $W = \bar{W}$ . Thus, he will always implement the pure-strategy equilibrium. The normal governor finds it too costly to provide public good, so only benevolent governor provide public good. Consequently, public good provision tells the population nothing about the secretary, and all collective action will fail. In this environment, central authority feels very confident to appoint the most competent local politicians. This is the key result of the paper. Strong decentralization catalyzes the effect of delegation which enables central authority to promote full political meritocracy.

Note that the meritocracy still prevails even if there is not too much flexibility on  $k$ . Suppose  $k$  is restricted to a specific range or even a singleton, which may be the case if benevolent secretary has a bliss point of  $k$ . Then by Proposition 6 delegation still strongly supports political meritocracy vis-a-vis no delegation. Also, note that decentralization has different effect on meritocracy under different political regimes: under concentration of powers, it strengthens the informativeness of signal and undermines political meritocracy. Under delegation, decentralization helps prevent collusion between governor and secretary and thus promotes meritocracy.

## 6. Weak Delegation: Secretary's Complete Dominance over Governor

In this section, I assume that the secretary can issue orders to the governor without any compensation, and the governor has to follow whatever the secretary directs. This is the extreme form of local party-state relationship, in which the governor has the weakest possible strength vis-a-vis secretary. Even with such weak governor, collective action risk will be reduced substantially, and central authority will push for meritocracy. As the cost of public good provision is still borne by the

governor, the signal remains uninformative. It forestalls effective communication between secretary and population.

The setup is very similar as in section 5.1. The difference here is that the governor has to do whatever the secretary directs. The secretary does not need to compensate the governor for his effort. So the collusion stage disappears, as secretary and governor behaves almost as a single agent. The difference from the single agent case is that the governor still bears the cost of public good provision.

**Lemma 7**

*Mixed equilibrium exists where the secretary mixes between proposing public good and not, and the population mixes between joining and not.*

*Denote that the normal secretary chooses {provides public good} with probability  $\hat{x}^s$ ; the population chooses {join} with probability  $\hat{y}$ . We have:*

$$\hat{x}^s = \frac{\mu}{1-\mu} \left\{ \frac{R}{c} - 1 \right\} = \frac{\mu}{1-\mu} \left\{ \frac{(1-2\lambda)W}{c} - 1 \right\}$$

$$\hat{y} = \frac{Q}{Q+R+S} = \frac{\lambda W}{(1-\lambda)W+S}$$

*And the secretary chooses {launch} after governor provides public good.*

The proof is almost the same as Lemma 2 and thus is omitted.

**Proposition 7 (Reduced Risk in Mixed Strategy Equilibrium)**

*The probability of collective action is:*

$$Pr(\text{collective action}) = \mu \frac{R}{c} \frac{\pi Q}{Q+R+S} = \mu \frac{(1-2\lambda)W}{(1-\lambda)W+S} \frac{\pi \lambda W}{c}$$

*Specifically, with the same level of competence, the probability of collective action under weak delegation is lower than that under no delegation:*

$$Pr(\text{collective action}|\text{weak delegation}) = \mu \frac{(1-2\lambda)W}{(1-\lambda)W(a)+S} \frac{\pi\lambda W}{c}$$

$$< \mu \frac{(1-\lambda)W(a)}{W(a)+S} \frac{\pi\lambda W(a)+k}{c} = Pr(\text{collective action}|\text{no delegation})$$

**Proof:**

The key is that  $\frac{(1-2\lambda)W}{(1-\lambda)W+S} < \frac{(1-\lambda)W}{W+S}$  and  $\frac{\pi\lambda W}{c} < \frac{\pi\lambda W+k}{c}$ .

**Q.E.D.**

The mechanical channel is that governor also captures a fraction of economic pie, so collective action benefit is reduced. The more important channel is that  $k$  does disappear in the formula under weak delegation. Thus, our original intuition survives even with such weak governor: the cost of public good provision falls on governor, which means that the signal is very uninformative for the secretary.

Different from prior cases, there is another equilibrium featuring no collective action:

***Proposition 7 (Public Good Provision but No Collective Action)***

*There is a (family of) PBE, in which benevolent secretary provides public good and normal secretary provides with probability  $\hat{x}^s > \frac{\mu}{1-\mu}(\frac{R}{c} - 1)$ . Both of them do not initiate any collective action. The population do not join any collective action.*

**Proof:**

$\{\cdot, \cdot, \cdot\}$  denotes whether benevolent secretary wants to provide public good, whether normal secretary wants to provide, and whether the population wants to join.

$\{\text{provide, provide with probability } \hat{x}^s > \frac{\mu}{1-\mu}(\frac{R}{c} - 1), \text{not}\}$  is a PBE: the benevolent secretary does not deviate; the normal secretary does not deviate as he will get the same utility, because all cost



of public good provision is borne by the governor; the population does not deviate by Assumption 1.

Uniqueness of pure PBE is similar as prior propositions and is omitted here.

**Q.E.D.**

We have another equilibrium where both normal and benevolent secretaries provide public good, and collective action is completely forestalled. So in this section with weak governor, we encounter multiple equilibria: the mixed strategy equilibrium with (reduced) collective action risk, and the pure strategy equilibrium without any risk. But whatever equilibrium arises, regime is more stable, meritocratic, and decentralized than the case with no delegation.

## 7. Dynamic Concern and Ambiguity about Party-Government Relationship

Central authority in China exhibits a reluctance to clarify party-government relationship. Although a Chinese governor is unambiguously much stronger than a Soviet one, it is unclear whether Chinese secretary dominates the governor. Judging from our analysis before, it is never optimal to allow secretary's dominance over governor. There are two possible equilibrium outcomes, with one of them featuring positive risk of collective action. By comparison, a power balance between secretary and governor has a single equilibrium with no collective action at all. So why does the central authority maintain such ambiguity? Why doesn't central leaders clearly separate economic and political powers?

The reason is quite clear if we take a dynamic view. Until now, my model is essentially static. There is only one period; after serving one term, both politicians retire. However, if they serve more than one term, then there is an obvious problem with power balance between secretary and governor. Only benevolent governor provides public good in equilibrium, which fully reveals her identity. If the governor becomes the new secretary in the next period, he can easily persuade the

population and challenge central authority.<sup>3</sup>

But if secretary completely dominates the governor, then the population learns nothing about governor in equilibrium. Thus, the concern about future collective action fully vanishes. Note that with complete dominance, central authority may face positive probability of collective action today (Proposition 7).

Central authority can do better by creating uncertainty towards party-government relation. Formally, suppose we have two periods. Governor in first period will be promoted as secretary in the second period and play the same game again. The governor in the second period is a new player. Then the game ends. Suppose in both periods the secretary dominates the governor with probability  $\xi$ , and there is a power balance with probability  $1 - \xi$ . This is the new policy instrument available to central authority to achieve better outcome.

We can assume that the principal imposes a very small punishment  $\epsilon > 0$  to secretary who does not provide public good. In this case, a strong secretary will always provide public good with probability 1, regardless of his benevolence. Then when the population observes a governor providing public good, they reason that he is benevolent with probability:

$$\frac{(1 - \xi)\mu + \xi\mu}{(1 - \xi)\mu + \xi} = \frac{\mu}{\xi + (1 - \xi)\mu}$$

For  $\xi > \frac{\mu}{1-\mu}(\frac{R}{c} - 1)$ , we will have:

$$U(\text{population}|\text{join}) = \frac{\mu}{\xi + (1 - \xi)\mu}[R + e - c] + (1 - \frac{\mu}{\xi + (1 - \xi)\mu})[e - c] < e = U(\text{population}|\text{not})$$

So the population will refuse to join collective action.

For people who are familiar with Bo Xilai Incident (articulated in section 8.2), the model says that population will not join any collective action launched by Huang Qifan, the governor of Chongqing, even if he will be promoted as the provincial secretary. The rationale is quite simple: Huang did provide lavish public good during Bo Xilai's reign, but it probably has nothing to do with his own benevolence. More likely, he was forced by Bo to provide them. This means that the public

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<sup>3</sup>I discussed in my companion paper why such promotion pattern is critical to maintain long time horizon of local politicians. So the problem cannot be solved by never promoting governor or transferring governor to other provinces.

good provision contains no information. Thus, even in a dynamic setting, the central authority feels safe. The analysis provides a simple yet powerful reasoning behind the seemingly bizarre design to allow secretary to dominate the governor. By doing so, not only potential collective action launched by secretary is forestalled, but also one launched by governor in the future when he becomes the secretary.

But  $\xi$  cannot be too large if the central authority worries about the equilibrium with positive risk of collective action when secretary dominates governor. I am going to characterize the value of  $\xi$  that forestalls collective action when secretary dominates governor.

**Proposition 8**

*If  $\xi < \frac{c-\mu R}{R(1-\mu)}$ , then the equilibrium featuring positive risk of collective action when secretary dominates governor can be eliminated.*

**Proof:**

Denote  $\hat{x}^s$  the probability that a strong secretary provides public good, and  $\hat{x}^w$  the probability that a weak secretary proposes to provide public good.  $\hat{y}$  is the probability that the population join collective action.

If  $\hat{y} = \frac{Q}{Q+(1-\eta)R+S}$ , there will be positive risk of collective action from weak secretary, and the strong secretary will never provide public good. Such situation can be eliminated by setting  $k > \pi R$ .

If  $\hat{y} = \frac{Q}{Q+R+S}$  and  $k > \pi R$ , then under weak secretary, only benevolent governor provide public good. The strong secretary is indifferent between {provide} and {not provide}.

But to have  $\hat{y} = \frac{Q}{Q+R+S}$ , we need  $\hat{\mu}R = c$ . So it must be:

$$\frac{(1-\xi)\mu^2 + \xi\mu}{(1-\xi)\mu + \xi[\mu + (1-\mu)\hat{x}^s]}R = c$$

Solve for  $\hat{x}^s$ :

$$\hat{x}^s = \frac{\mu}{\xi(1-\mu)} \left\{ [(1-\xi)\mu + \xi] \frac{R}{c} - 1 \right\}$$

To eliminate the equilibrium, we need to guarantee that  $\hat{x}^s < 0$ , or:

$$[(1 - \xi)\mu + \xi] \frac{R}{c} - 1 < 0$$

$$\xi < \frac{c - \mu R}{R(1 - \mu)}$$

Note  $\frac{c - \mu R}{R(1 - \mu)} < 1$  if  $R > c$ .

**Q.E.D.**

**Corollary 1**

If  $c > \sqrt{\bar{\mu}R}$ , then for  $\xi^* \in (\frac{\mu}{1 - \mu}(\frac{R}{c} - 1), \frac{c - \mu R}{R(1 - \mu)})$ , the population will refuse to join the collective action of either current secretary or future secretary who is currently governor. Given this, only benevolent and strong secretary and benevolent and strong governor will provide public good, and all secretaries will abstain from collective action.

**Proof:**

The key is that we need to have:

$$\frac{\mu}{1 - \mu}(\frac{R}{c} - 1) < \frac{c - \mu R}{R(1 - \mu)}$$

which reduces to  $c^2 > \mu R^2$ .

The strategies are obviously optimal given our analysis before.

The population's belief is off-equilibrium. So it has to be identified by Assumption 3:

$$\hat{\mu} = \bar{\mu} = \frac{(1 - \xi)\mu^2\pi + \xi\mu\pi}{(1 - \xi)\mu\pi + \xi\mu\pi} = (1 - \xi)\mu + \xi$$

It is indeed not optimal for the population to join as for  $\xi < \frac{c - \mu R}{R(1 - \mu)}$ :

$$[(1 - \xi)\mu + \xi] \frac{R}{c} - 1 < 0$$

**Q.E.D.**

$c > \sqrt{\mu}R$  is slightly stronger than Assumption 1, which states that  $c > \mu R$ . But if  $c > \sqrt{\mu}R$  is true, then the central authority can manipulate the belief of population regarding the strength of governor, and the result is that both current and future collective actions will be forestalled. So first best achieves for the central authority when the secretary dominates governor with probability  $\xi^* \in (\frac{\mu}{1-\mu}(\frac{R}{c} - 1), \frac{c-\mu R}{R(1-\mu)})$ . Note it is not desirable if the secretary always dominates governor. Thus, the central authority constantly emphasize the leadership of party over government; but at the same time, it also stresses that the power of “first hand” should be divided and constrained (e.g., People’s Daily, 2014).

The analysis echoes research on strategic media censorship in China (Lorentzen, 2014). When the economy is doing badly, the propaganda department allows low media freedom. When the economy is doing fine, censorship is loosen and media reporting is relatively free. By doing this, the population always receive a constant signal about the state of the world, so they cannot infer whether governance is bad and thus whether it is a good opportunity to revolt. My analysis shares a similar flavor. By creating uncertainty regarding the strength of governor, the central authority “confuses” the population and induces the population to abstain from collective actions launched by either current secretary or future secretary.

Such stochastic dominance of secretary over governor is clever. But it still has huge cost. The power duality is actually a good framework to design checks and balances that will help fight corruption and rent-seeking (Persson, Tabellini, Roland, 2000). The CCP itself recognize the point. But when secretary gains complete dominance of governor, such power duality has obviously no bite in fighting corruption. In a future appendix, I am going to show how to modify the classic model of Persson, Tabellini, Roland, (2000) to study the efficiency loss from stochastic dominance of secretary.

# 8. Case Studies from Imperial and Contemporary China

## 8.1 Meritocracy and Separation of Powers in Imperial China

### 8.1.1. An Overview

Separation of powers is not a new feature of Chinese politics. Chinese rulers long recognized the key role of “divide and rule” in stabilizing their regimes. The more remarkable feature is that meritocracy (manifested as civil service exam) was strongly correlated with separation of powers over two thousand years of Chinese history. Meritocracy was usually established or re-established only after the consolidation of separation of powers. Furthermore, meritocracy tracked local separation of powers especially closely. This makes sense as central separation of powers only solves loyalty-competence trade-off at imperial court, which has a small number of officials. But if local separation of powers is enforced, the emperor needs to find a large number of capable candidates to work as local politicians. I am going to give a very brief historical review of stability, meritocracy, and separation of powers here. Most of the narratives here are synthesized from Bai, (1996) and Yang, (1996).

Chinese empire was always very decentralized. It was extremely difficult for the imperial court to communicate with local jurisdiction, so the majority of decisions had to be made by local politicians. In the language of my model,  $k$  is constrained to be a large number. The model predicts low meritocracy and stability under concentration of powers, and high meritocracy and stability under separation of powers. This is indeed the case. Han Dynasty (202BC-220AD) experimented with local separation of powers by appointing censors to monitor provinces. The separation of powers was very primitive: there was no division between political and economic powers, and censors need to monitor several provinces simultaneously. It was only able to support a very weak form of meritocracy (“Chaju”), where recommendation from local nobility and politicians was much more important than performance in exam. The system collapsed after Huangjin Rebellion (184 AD), when the emperor awarded all important powers to censors so that they had the capacity to suppress

the rebellion. But the decision destroyed local separation of powers, and China entered into almost four centuries of fragmentation.

During the fragmentation period (184AD-589AD), emperors did not have enough power to enforce local separation of powers. Interestingly, the emperors tried to establish and enforce separation of powers in the imperial court. But the system did not support any form of meritocracy. Indeed, the fragmentation period is the Chinese age of aristocracy, when the family name of a candidate determined the official position assigned to him. Sui and Tang Dynasties (589-907AD) firmly established separation of powers in the imperial court, and at the same time began to experiment meritocracy in the form of civil service exam. However, family origins still plays a far more important role in political selection than the exam.

After a brief period of extreme chaos and fragmentation, Song Dynasty (960AD-1279AD) enforced an elaborated system of checks and balances. In every prefecture, one or two monitoring officials were assigned to the governor. Every official document needs the joint signature of the governor and monitoring officials to be effective. In the province, there were governors in charge of fiscal resource, judicial power, and military power. This is the first form of separation of political and economic powers, and the separation was deliberately established to constrain the fiscal governor. Consequently, local politicians were extremely loyal to the emperor in Song Dynasty, and the emperor in turn selected almost all politicians based on their merits. The civil service exam entered its golden age, when hundreds of degrees were awarded for every exam. Aristocracy completely vanished from politics, and all important positions were held by politicians with a degree from civil service exam.

Yuan Dynasty (1271AD-1368AD) was established by Mongols. The dynasty defied Chinese institutions, and both separation of powers and meritocracy were very weak. Ming Dynasty (1368AD-1644AD) re-established local separation of powers. In province, the three governors were in charge of economy, the court, and the military respectively. Ming Dynasty also revived civil service exam as the main vehicle of political selection. Qing Dynasty (1644AD-1911AD) inherited the institution of Ming Dynasty, and enforced a even more complex network of provincial-level governors with very high level of competence (Guy, 2010).

## 8.2 The Case Studies of Modern Chinese Politics

At the heart of my theory is that population show strong loyalty and support to local politicians who engage with aggressive redistribution or public good provision. This is actually one of the most important themes of Chinese politics. Ever since Imperial China, leaders of many rebellions redistributed land to peasants, which gained strong loyalty from peasants. Consequently, many dynasties declined or fell as a result of such rebellions. CCP is the modern master of such tactic. CCP systematically enforced “land reform” in its revolutionary bases during the second and third Chinese Civil Wars (1927-1937; 1945-1949), winning strong support from peasants that sealed the victory of Chinese Communists (Pepper, 1999). In (Mao, 1945), Mao Zedong himself stated that *"Our party must bring tangible benefits to the people. Only then will the masses support us and oppose the Kuomintang (the party that ruled China before 1949) attacks. Otherwise, the masses will be unable to see clearly which of the two parties, the Kuomintang or the Communist Party, is good and which is bad"* (translated and cited by Pepper, 1999). Here, Mao explicitly identified redistribution and public good provision as a signaling device.

Quite recently, the former Chongqing secretary Bo Xilai reincarnated the old tactic. An excellent survey article is Zhao, (2012). During Bo’s reign of the province (2007-2012), he advocated “Chongqing Model” that emphasizes social and economic equality. Firstly, the administration implemented a phenomenal public good building. “Chongqing spent more than half of all government expenditures on improving public welfare, particularly the livelihood of workers and farmers (Zhao, 2012)”. Cheap public housing was extensively built, a large number of city “Hukou” were granted to farmers, and the whole bureaucratic system was mobilized to understand the needs of grass-root residents. Besides, intense propaganda of Maoist and socialist values complements public good provision. As a consequence, Bo Xilai administration enjoys enormous popularity, especially among low income households. The Bo Xilai Saga still had many details that remained unclear, such as whether Bo did intend to launch a coup against central leadership. But such rumor is widespread. And it is accepted that Bo at least aspired to use his remarkable achievement in Chongqing to enter Standing Committee of CCP Politburo, the supreme decision-making group with seven or nine members, including the general secretary (also the president), the prime minister, and the



Congress chairman. Interestingly, during the months when the police chief of Chongqing defected and Bo Xilai Incident erupted, the popularity of Bo's policy did not transform into real support of Bo from the population. There is no public rally or protest to support Bo, who was eventually taken into custody and sent to prison. The saga revealed that disloyalty of provincial politicians is still a major concern for central leaders in China, but at the same time even an extremely artful politician like Bo was constrained by the system to transform popularity to mass support. This is quite consistent with my theory in section 8.2. It is well known that Bo Xilai is an unusually powerful and ambitious politician with princeling background, and the governor of Chongqing might be completely dominated by Bo. But the beauty of Chinese party-state structure is that even with such weak governor, there is hope to fully forestall collective action for the central authority. In the end, the Bo Xilai administration provides public good aggressively, but the population remains immobilized in Bo's endeavor to challenge central authority.

## 9. Conclusion

We have seen that the power duality between secretary and governor serves as the institutional foundation of China's stability, decentralization, and political meritocracy. The unique party-state structure is a modern incarnation of Imperial China's institution mixed with Leninism. After Maoist China experimented with the strict form of Leninism in which party directly controlled economic power, China delegates economic power to governor that achieves a subtle power balance in local politics. This is in line with a literature from political science (e.g., Tsai, (2007)) , which argues that China usually implements remarkable reforms within existing institutional framework.

The subtle duality of party-government minimizes the cost of collective action, either organized by population or led by officials. But the design only works well if the population can be co-opted by material benefits. If the population strongly demand both economic and political rights, the party-government duality can be a key friction in dealing with mass revolt. Thus, the current Chinese institution may look extremely robust, but it can be fragile to large shocks that require the coordination of political and economic powers from the state.

Recent research of authoritarian and totalitarian regimes try to understand how propaganda and

public good provision consolidated autocrat's power. Adena et. al. (2014) finds that radio coverage helped Nazi to win popular support. Voigtlaeder, Voth, (2015) noted that highway construction also significantly improved the support for the Nazi regime. Importantly, the effect is especially strong when it was complemented by radio coverage. Thus in typical autocratic consolidation, propaganda and economic powers complement each other. As a local politician in authoritarian regimes is "petty dictator" himself (Lieberthal, 2005), the concentration of local economic and political power is detrimental to central authority in any autocratic regime. Thus, they should always try to separate political and economic power and my theory should travel beyond China.

Indeed, Vietnam has a history of party-state relationship that parallels Chinese experience. An excellent survey is Tran, (2004). Following the establishment of central planning, Vietnamese Communist Party (VCP) took comprehensive control of economic management and the government's power was substantially undermined. Economic performance of Vietnam was very poor during the central planning decades, and consequently Vietnam began her reform "*Doi Moi*" in 1986. The government gained significant power and autonomy in economic policymaking and the regime also began to grant more discretion to local politicians. Political meritocracy started to emerge, and it reaches a landmark in the Tenth National Congress of VCP in 2006, when almost all revolutionary cadres stepped down from leadership and a new generation of politicians took control. The experience of Vietnam provides another example of how planned economy enforces concentration of powers while market economy enforces delegation, which is discussed in my companion paper. Also, the same story holds for Vietnam that delegation provides a foundation of decentralization and positive political selection.

Similar arrangement also prevails in many historical regimes. Finer's *A History of Government* states that controlling local officials is a key problem for any autocracy. A careful reading of Finer, (1997) reveals that Ottoman Empire, Russian Empire, and Spanish Colonial Empire all established institutions to constrain the power of appointed local leaders that follow the principle of "checks between higher ranked and lower ranked". For Ottoman Empire, "what care (do) the Turks take to preserve the body of their Empires free of faction and rebellion?". The first answer proposed by Finer is that "governors...shared some of their authority with the *defterdars*(fiscal governor), the chief *kadi*, and the Janissary commanders. Also, the *timars* (provinces) were now allocated by the

palace, so governors could not build a local power-base” (page 1194, Finer, 1997). Under Catherine the Great, each Russia *guberniya* (province) had “a governor, plus a deputy governor in charge of finance. The governor did not himself issue orders. In the fashion of the day, he presided over a collegiate board which did this – the governor, his deputy, and two appointed councillors” (page 1420, Finer, 1997). As to Spanish Colonial Empire, “(Viceroyalties) were ... immense, and tiers of intermediate officers were necessarily interposed between the viceroys and the cabildos at the base. Such were the presidents, and the captains-general, who enjoyed very great discretion. They did not take their orders from the viceroy as one would expect, but directly from the Crown which appointed and removed them, and it was to the Crown they reported; so that they often acted in disregard of the viceroy” (page 1388, Finer, 1997). Although details vary, general pattern does emerge: different from liberal democracy, “separation of power” in autocracy does not emphasize too much on strong checks and balances. Instead, the regime usually relies on a lower ranked official who controls everyday management and thus real power. The comparison I am doing here is simple and superficial. We need much more attention to this kind of institutions to deepen our understanding of autocracy and authoritarianism.

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## Appendices

### A1. Micro-foundation for Focusing on Equilibria with Pure Strategy for Section 5 and Section 6

I am going to provide a micro-foundation to justify my focus on equilibria with pure strategy for {launch} and {not launch}. Let us assume that instead the secretary can choose mixed strategy between {launch} and {not launch}. The normal secretary chooses {launch} with probability  $z_1$ , and the benevolent secretary chooses {launch} with probability  $z_2$ .

Note that it is impossible for the benevolent secretary to mix: if that's the case,  $\hat{y}_2 = \frac{Q}{Q+(1-\eta)\gamma R+S}$ . This means that the normal secretary never launch, because he needs a  $\hat{y}_1 = \frac{Q}{Q+(1-\eta)R+S} > \hat{y}_2$ . This means that the population knows for sure that anyone leading a collective action is benevolent, so they do not want to choose  $\hat{y} = 0$ .

If the normal secretary mix, we must have  $\hat{y} = \frac{Q}{Q+(1-\eta)R+S}$ . Note that normal secretary always have incentive to mix between {propose collusion} and {not}:  $(1-\pi)Q + \pi((1-\hat{z}_1)Q + \hat{z}_1[(1-\hat{y}) * 0 + \hat{y}(Q + (1-\eta)R + S)]) = (1-\pi\hat{z}_1)Q + \pi\hat{z}_1Q = Q$ .

The secretary will compensate enough so that normal governor will always provide public good.

To induce population to mix between {join} and {not join}:  $\frac{[\mu^2+(1-\mu)\mu]\pi}{\{\mu[\mu+(1-\mu)\hat{z}_1]+(1-\mu)[\mu+(1-\mu)\hat{x}_1\hat{z}_1]\}\pi}(1-\hat{\eta})R = c$ .

The probability of collective action is:

$$\{\mu[\mu+(1-\mu)\hat{z}_1]+(1-\mu)[\mu+(1-\mu)\hat{x}_1\hat{z}_1]\}\pi\hat{y} = \mu\frac{(1-\eta)R}{(1-\eta)R+Q+S}\frac{\pi Q}{c}$$

The normal governor requires an compensation  $\eta R$  that satisfies:

$$(1-\pi)(Q-k)+\pi\{(1-\hat{z}_1)(Q-k)+\hat{z}_1[(1-\hat{y})(Q-k)+\hat{y}(Q+\eta R-k)]\}=Q$$

$$\eta R = \frac{k(Q+R+S)}{(\pi Q+k)\hat{z}_1}$$

The probability of collective action is:

$$\mu\frac{(1-\eta)R}{(1-\eta)R+Q+S}\frac{\pi Q}{c}$$

At first glance, the formula is exactly the same as the one in Proposition 6. But actually the two probabilities are different, as  $\hat{\eta}$  depends on  $\hat{z}_1$ . Note that  $\eta R$  is smallest with  $\hat{z}_1 = 1$ , which means that  $\text{Prob}(\text{collective action}) = \mu\frac{(1-\eta)R}{(1-\eta)R+Q+S}\frac{\pi Q}{c}$  is the highest with  $\hat{z}_1 = 1$ . So by treating  $\hat{z} \in \{0,1\}$ , we already consider the most risky case for the principal, and is consequently without loss of generality.

For section 6, the argument is even stronger. We can see that in section 6.2, whatever  $\hat{z}_1$  is, the probability of collective action is the same.

With similar argument, when secretary completely dominates the governor, the only possible case involving mixed strategies is that the normal secretary mixes between {provide} and {not provide}, and the normal secretary mixes between {lead} and {not lead}. To induce such mixed strategy,  $\hat{y} = \frac{Q}{Q+R+S}$ . To induce population to mix, the normal secretary must choose  $\hat{x}_1$  and  $\hat{z}_1$  such that  $\frac{\mu}{\mu+(1-\mu)\hat{x}_1\hat{z}_1}R = c$ , or  $\hat{x}_1\hat{z}_1 = \frac{\mu}{1-\mu}(\frac{R}{c} - 1)$ . So  $\text{Prob}(\text{collective action}) = (1-\mu)\hat{x}_1\hat{z}_1\pi\hat{y} + \mu\pi\hat{y} =$



$\mu \frac{R}{R+Q+S} \frac{\pi Q}{c}$ , which is independent of  $\hat{z}_1$  that the normal secretary chooses. So our analysis in Section 6 is without loss of generality.

Let us turn to section 5.2, or when  $k > \pi R$ . In this case, only benevolent governor provides public good. If we allow the secretary to mix between {lead} and {not lead}, there is another equilibrium with positive probability of collective action. To induce population to mix,  $\frac{\mu \hat{z}_2}{(1-\mu)\hat{z}_1 + \mu \hat{z}_2} R = c$ . Again, the only possible mixed strategy equilibrium involves  $\hat{z}_1 \in (0, 1)$  and  $\hat{z}_2 = 1$ . We have  $\frac{\mu}{(1-\mu)\hat{z}_1 + \mu} R = c$ , so  $\hat{z}_1 = \frac{\mu}{1-\mu} (\frac{R}{c} - 1)$ . To induce normal secretary to mix,  $\hat{y} = \frac{Q}{Q+R+S}$ . So the probability of collective action is:

$$\mu \{ (1-\mu)\hat{z}_1 \pi \hat{y} + \mu \pi \hat{y} \} = \mu^2 \frac{R}{R+Q+S} \frac{\pi Q}{c}$$

Note that  $\mu$  denotes the fraction of benevolent secretary.  $\mu$  is probably small, which means that  $\mu^2 \frac{R}{R+Q+S} \frac{\pi Q}{c}$  is truly second-order. As usual,  $k$  disappears from the formula.

For  $\frac{\pi Q [R - (2-\mu)c]}{Q+S+(2-\mu)c} < k < \pi R$ , we know that the normal secretary cannot mix between {propose} and {not propose}. Assume that normal governor provides public good with probability  $\hat{z}_g$ . And the normal secretary chooses to {lead} with probability  $\hat{z}_1$ . Then:

$$\hat{\mu} = \frac{[\mu + (1-\mu)\hat{z}_g] \mu \pi}{[\mu + (1-\mu)\hat{z}_g][\mu + (1-\mu)\hat{z}_1] \pi} = \frac{\mu}{\mu + (1-\mu)\hat{z}_1}$$

So again, to have  $\hat{\mu}(1-\hat{\eta})R = c$ , we need  $\hat{z}_1 = \frac{\mu}{1-\mu} (\frac{(1-\hat{\eta})R}{c} - 1)$ . To induce normal secretary to mix, we need  $\hat{y} = \frac{Q}{Q+(1-\hat{\eta})R+S}$ .

To compensate normal governor, we need:

$$(1-\pi)(Q-k) + \pi \{ (\mu + (1-\mu)\hat{z}_1) \hat{y} (Q + \eta R - k) + [1 - (\mu + (1-\mu)\hat{z}_1)] (Q - k) \} \geq Q$$

Note that we need  $(1-\pi)(Q-k) + \pi \{ (\mu + (1-\mu)\hat{z}_1) \hat{y} (Q + \hat{\eta} R - k) + [1 - (\mu + (1-\mu)\hat{z}_1)] (Q - k) \} = Q - k + \pi (\mu + (1-\mu)\hat{z}_1) \hat{y} \hat{\eta} R \geq Q$ , or  $\pi (\mu + (1-\mu)\hat{z}_1) \hat{y} \hat{\eta} R = \pi \mu \frac{R}{c} \hat{y} \hat{\eta} R > k$ . Note that as  $\frac{\pi Q [R - (2-\mu)c]}{Q+S+(2-\mu)c} < k$ , we already have  $(1-\pi)(Q-k) + \pi (\hat{y} (Q + \eta R - k) + (1-\hat{y})(Q-k)) < Q$ , or  $\pi \hat{y} \hat{\eta} R < k$ . As  $\mu \frac{R}{c} < 1$ , so  $\pi \mu \frac{R}{c} \hat{y} \hat{\eta} R < \pi \hat{y} \hat{\eta} R < k$ . So the normal governor will never mix. So  $\hat{z}_1 = 0$ , and the probability of collective action is again:

$$\mu\{(1-\mu)\hat{z}_1\pi\hat{y} + \mu\pi\hat{y}\} = \mu^2 \frac{R}{R+Q+S} \frac{\pi Q}{c}$$

Note that with the additional equilibrium, the maximum probability of collective action with  $k > \frac{\pi Q[R-(2-\mu)c]}{Q+S+(2-\mu)c}$  is still lower than the case  $k > \frac{\pi Q[R-(2-\mu)c]}{Q+S+(2-\mu)c}$ . Specifically, we want to show that:

$$\mu^2 \frac{R}{R+Q+S} \frac{\pi Q}{c} < \mu \frac{(1-\hat{\eta})R}{c} \frac{\pi Q}{Q+(1-\hat{\eta})R+S}$$

For the right hand side, the lowest probability of collective action is reached when  $k = \frac{\pi Q[R-(2-\mu)c]}{Q+S+(2-\mu)c}$ . In this case, as  $(1-\hat{\eta})R = (2-\mu)c$ , we have:  $\mu \frac{(1-\hat{\eta})R}{c} \frac{\pi Q}{Q+(1-\hat{\eta})R+S} = \mu(2-\mu) \frac{\pi Q}{Q+(1-\hat{\eta})R+S}$ . We need:

$$\mu^2 \frac{R}{R+Q+S} \frac{\pi Q}{c} < \mu(2-\mu) \frac{\pi Q}{Q+(1-\hat{\eta})R+S}$$

$$\mu \frac{R}{c} < (2-\mu) \frac{R+Q+S}{Q+(1-\hat{\eta})R+S}$$

Note that  $(2-\mu) \frac{R+Q+S}{Q+(1-\hat{\eta})R+S} > 2-\mu > 1$ , so we need  $\mu \frac{R}{c} < 1$ . This is guaranteed by Assumption 1.

So ignoring the mixture between {lead} and {not lead} in the main text does not change our results at all. The central authority still have strong incentive to implement decentralization and corresponding meritocracy.

Notice that ignoring the mixture between {lead} and {not lead} actually strengthens my analysis in section 7: it eliminates risk of collective action under balance of power. But even in this case, section 7 shows that the central authority still maintains a stochastic advantage of secretary because of dynamic concern that governor will work as secretary in the future.

## A2. A Model with Alternative Timeline

Readers may question whether the results are robust to timeline assumptions. Specifically, what will happen if the population launches spontaneous protest first and then secretary organize it and turns it into collective action? In this section, I am going to show that the model is very robust. Specifically, I will change the timeline during the mobilization stage, and everything else will be the same. We will see that all results of meritocracy are still very strong, but we lose predictions on decentralization. This is not a problem as long as the timeline assumed in workhorse model arises with positive probability. The alternative model also has the advantage of being especially simple and clear. Many results before that relies on technical lemmas can be easily proved under the alternative model.

### A2.1 Benchmark case

The general timeline is the same as before: 1. appointment stage; 2. signaling stage; 3. mobilization stage; 4. divide the pie. The only change is about mobilization stage. I am going to treat decentralization  $k$  as an exogenous variable for this section.

**Mobilization stage:** The population decides whether to launch a spontaneous protest with a cost of  $c$ . The secretary then decides whether to abstain or organize and turns the protest into a collective action. If the population launches a protest, and the secretary do not organize, the normal secretary will get  $Q - k$ , the benevolent secretary will get  $Q + \gamma e(k) - k$ , and the population get  $e - c$ . If the secretary organizes, then the collective action succeeds.

Obviously, in the pie-division stage, the normal secretary will capture all benefits and gets  $Q + R - k$ , and benevolent secretary will award all benefits to the population and gets  $Q + \gamma R + \gamma e - k$ .

First, analyze the best response of players in the game.

1. Normal secretary always choose {capture all benefits}; benevolent secretary always choose {award all benefits}.
2. Both normal and benevolent secretary choose {organize a collective action} given that the population launch one.
3. Denote the belief that the secretary is benevolent at the beginning of mobilization stage as

$\hat{\mu}$ . The population launch a protest if  $\mu R > c$ ; mix (with probability  $\hat{y}$ ) between {launch} and {abstain} if  $\mu R = c$ ; and choose {abstain} if  $\mu R < c$ .

4. The normal secretary chooses {provide public good} if

$$(1 - \pi)(Q - k) + \pi[(1 - \hat{y})(Q - k) + \hat{y}(Q + R + S - k)] > Q$$

will mix between {provide} and {not provide} if  $(1 - \pi)(Q - k) + \pi[(1 - \hat{y})(Q - k) + \hat{y}(Q + R + S - k)] = Q$ , and chooses {not provide} if  $(1 - \pi)(Q - k) + \pi[(1 - \hat{y})(Q - k) + \hat{y}(Q + R + S - k)] < Q$ .

The benevolent secretary always chooses {provide}. Denote  $b = \gamma e(k) - k > 0$ , we have:

$$(1 - \pi)(Q + b) + \pi[(1 - \hat{y})(Q + b) + \hat{y}(Q + \gamma R + S + b)] = Q + b + \pi\hat{y}(\gamma R + S) > Q$$

So we prove that benevolent secretary is a commitment type. Note how easy it is to prove this result compare to Lemma 2.

To consider a especially simple case, I assume that  $k > \pi(Q + S)$ . In this case, the normal secretary also becomes a commitment-type. He is committed to not provide public good at all:

$$(1 - \pi)(Q - k) + \pi(Q + R + S - k) < Q$$

***Proposition A1 (Loyalty-Competence Tradeoff under Alternative Model)***

$\{\cdot, \cdot, \cdot, \cdot, \cdot\}$  denotes whether benevolent and normal secretaries provide public good, whether the population launches a protest, and whether the benevolent and normal secretaries organize the collective action.

If  $k > \pi(R + S)$ ,

***A1.1 Collective action risk in equilibrium***

If  $R \geq c$ , then in the unique PBE, {provide public good, not provide, protest, organize, organize} is the strategy profile.

***A1.2 No collective action risk in equilibrium with low competence***

If  $R < c$ , then in the unique PBE,  $\{\text{provide, not provide, not protest, organize, organize}\}$  is the strategy profile.

$\bar{R}$  denotes principal's surplus produced by the most competent secretary, If  $(1 - \mu\pi)(\bar{R} + S) \geq (c + S)$ , the principal implements equilibrium with positive probability of protest and chooses the most competent secretary. If  $(1 - \mu\pi)(\bar{R} + S) < (c + S)$ , the principal implements the collective-action-free equilibrium with low competence  $R(a) = c$

**Proof:**

From our discussion before, we already show  $\{\text{provide, not provide}\}$  and  $\{\text{organize, organize}\}$  are optimal. The only thing that we need to verify is the strategy of the population.

If  $R \geq c$ , given that only benevolent secretary provide public good,  $\hat{\mu} = 1$ . So  $\hat{\mu}R = R > c$ , it is optimal for the population protest.

If  $R < c$ , then  $\hat{\mu}R = R < c$ . So the population does not protest.

Given the behaviors of secretaries and population, the principal's strategy is trivial to prove.

The uniqueness of pure strategy PBEs is trivial to prove.

**Q.E.D.**

From the proof, we can see that the model allows an especially simply demonstration of the main benchmark result, loyalty-competence trade-off. We have the same intuition that the central authority either face a competent but revolutionary secretary or a loyal but mediocre one.

## A2.2 Delegation Promotes Meritocracy

The setup is the same as section 5.1. The only difference is that mobilization stage is modified and it is the same as section 8.1. Again, let us analyze the best responses first.

1. Normal secretary always choose  $\{\text{capture all benefits}\}$ ; benevolent secretary always choose  $\{\text{award all benefits}\}$ .

2. Both normal and benevolent secretary choose  $\{\text{organize a collective action}\}$  given that the population launch one.

3. Denote the belief that the secretary is benevolent at the beginning of mobilization stage as  $\hat{\mu}$ . The population launch a protest if  $\mu(1 - \eta)R > c$ ; mix (with probability  $\hat{y}$ ) between  $\{\text{launch}\}$

and {abstain} if  $\mu(1 - \eta)R = c$ ; and choose {abstain} if  $\mu(1 - \eta)R < c$ .

4. The normal governor chooses {provide public good} if

$$(1 - \pi)(Q - k) + \pi[(1 - \hat{y})(Q - k) + \hat{y}(Q + \eta R + S - k)] > Q$$

will mix between {provide} and {not provide} if  $(1 - \pi)(Q - k) + \pi[(1 - \hat{y})(Q - k) + \hat{y}(Q + R + S - k)] = Q$ , and chooses {not provide} if  $(1 - \pi)(Q - k) + \pi[(1 - \hat{y})(Q - k) + \hat{y}(Q + \eta R + S - k)] < Q$ .

The benevolent governor always chooses {provide}. Denote  $b = \gamma e(k) - k > 0$ , we have:

$$(1 - \pi)(Q + b) + \pi[(1 - \hat{y})(Q + b) + \hat{y}(Q + \gamma(1 - \eta)R + \eta R + S + b)] = Q + b + \pi\hat{y}(\gamma(1 - \eta)R + \eta R + S) > Q$$

So we prove the property of commitment-type for benevolent governor.

5. Secretaries' collusion behavior will be left in the proof of Proposition 10 to discuss.

***Proposition A2 (Risk-free PBE and Meritocracy)***

$\{\cdot, \cdot, \cdot, \cdot, \cdot\}$  denotes whether benevolent and normal governors provide public good, whether the population protest, and whether the benevolent and normal secretaries organize the collective action.

If  $k > \pi(R + S)$ , {provide, not provide, not protest, organize, organize} is the strategy profile in any PBE. There is no collective action, so the central authority chooses the most competent secretary and governor.

**Proof:**

If  $k > \pi(R + S)$ , the normal governor never accepts any proposal of collusion. This means that only benevolent governor provides public good, and normal governor does not. Population's posterior on secretary's benevolence is unchanged:

$$\hat{\mu} = \frac{\mu * \mu}{\mu} = \mu$$

Given that  $\mu R < c$ , the population refuses to launch any protest.

Given that there will be no protest, the secretary will be indifferent between propose collusion or not, as the distribution of revolutionary benefit is off-equilibrium and will not materialize.

Note the uniqueness of the strategy profile {provide, not provide, not protest, organize, organize}

is trivial to prove.

**Q.E.D.**

### A2.3 Delegation Promotes Meritocracy with Weak Governor

The setup is the same as section 6.2. The only difference is that mobilization stage is modified and it is the same as section 8.1. Recall that the governor has no autonomy in decision making, yet all cost of public good provision falls on him. Again, let us analyze the best responses first.

1. Normal secretary always choose {capture all benefits}; benevolent secretary always choose {award all benefits}.

2. Both normal and benevolent secretary choose {organize a collective action} given that the population launch one.

3. Denote the belief that the secretary is benevolent at the beginning of mobilization stage as  $\hat{\mu}$ . The population launch a collective action if  $\mu R > c$ ; mix (with probability  $\hat{y}$ ) between {launch} and {abstain} if  $\mu R = c$ ; and choose {abstain} if  $\mu R < c$ .

4. The normal secretary always choose {provide public good} if  $\hat{y} > 0$

$$(1 - \pi)(Q) + \pi[(1 - \hat{y})(Q - k) + \hat{y}(Q + \eta R + S - k)] > Q$$

and will mix between {provide} and {not provide} if  $\hat{y} = 0$ .

The benevolent secretary always chooses {provide}. We have:

$$(1 - \pi)(Q + \gamma e) + \pi[(1 - \hat{y})(Q + \gamma e) + \hat{y}(Q + \gamma R + S + \gamma e)] = Q + \gamma e + \pi\hat{y}(\gamma R + S) > Q$$

**Proposition A3 (Risk-free PBE and Meritocracy)**

$\{\cdot, \cdot, \cdot, \cdot, \cdot\}$  denotes whether benevolent and normal secretaries provide public good, whether the population protest, and whether the benevolent and normal secretaries organize the protest.

In any PBE, the population chooses {not protest}, and the benevolent and normal secretaries choose {organize, organize}. The benevolent secretary always provide public good, and the normal secretary provide public good with probability  $\hat{x} \geq \frac{\mu}{(1-\mu)}(\frac{R}{c} - 1)$ .

**Proof:**

Note that {protest} cannot be a PBE strategy. As the best response is for both secretaries to provide public good, so  $\hat{\mu} = \mu$ , and it is optimal for the population to deviate to {not protest}.

To support {not protest}, it must be the case that the normal governor provides public good with probability  $\hat{x}$  that satisfies:

$$\frac{\mu}{(1-\mu)x + \mu} R \leq c$$

So  $\hat{x} \geq \frac{\mu}{1-\mu}(\frac{R}{c} - 1)$ .

Note that the normal governor cannot increase his utility by single-deviation. He always get  $Q$ , given that the population does not protest.

There are no other possible equilibria.