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journal homepage: www.elsevier.com/locate/jceCrony capitalism, the party-state, and the political boundaries of corruption[☆]Weijia Li^a, Gérard Roland^{b,*}, Yang Xie^c^a Monash University, 900 Dandenong Road, Building H, Room H4.48, Caulfield East, VIC 3145, Australia^b University of California, Berkeley, CEPR, and NBER, 625 Evans Hall, Berkeley, CA 94720, USA^c University of California, Riverside, 900 University Avenue, 4128 Sproul Hall, Riverside, CA 92521, USA

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ABSTRACT

We build a model that puts together crony capitalism, the hierarchy of the Chinese communist party-state, and the decision-making process inside the Party Center. We show that inefficient economic institutions create local corruption that raises realized productivity, while generating rents that flow along the party-state hierarchy up to the provincial level, threatening the Center's control in potential crises. Although both stronger crisis control and higher economic performance help the Center's goal to stay in power, we show that given a general fat-tailed risk of crisis, the Center will maximize crisis control at the expense of the economy when choosing its tolerance of local corruption. Power structure and corruption within the Center and reciprocal accountability between central and provincial leaders are also analyzed. Our analysis suggests conditions under which China's communist regime will or will not deal with the existential threat presented by corruption.

1. Introduction

An overarching view on the institutional foundations of China's economic growth in recent decades is the concept of the regionally decentralized authoritarian system developed by [Xu \(2011\)](#). Present at all levels of government, the Chinese Communist Party has built a party-state with a top-down hierarchy, while decentralizing resources and policy instruments to officials at lower levels; the Party organizes a yardstick competition among its officials for promotion along the hierarchy, where economic growth has in recent decades been the target that the Party set for the competition (e.g., [Maskin et al., 2000](#); [Li and Zhou, 2005](#)). This view is complemented by the characterization of crony capitalism or “special deals” with Chinese characteristics by [Bai et al. \(2014, 2020\)](#). In this characterization, the economic institutions are highly inefficient due to distortionary regulations; corruption between officials and private businesses protects crony firms from these inefficiencies, whereas the damages of classic crony capitalism are alleviated by features of the regionally decentralized authoritarian system. Hereby we have a benchmark model of the political

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economy of China's growth (as in, e.g., An et al., 2016; Francois et al., 2016; Lorentzen, 2017; Lei, 2018; Chen and Kung, 2019; He et al., 2020).

Given the benchmark model, questions arise about the potential existential threat of corruption to the survival of China's communist regime and its incumbent leaders. How and to what extent can corruption present a threat to the power of the Party-state? Given that the legitimacy of the Party's rule relies crucially on economic performance (e.g., Zhao, 2009), does the Party face a trade-off between the power consolidating effects of fighting corruption and its potential costs in terms of economic performance? Under what political and economic conditions will the Party-state decide to crack down on corruption?

To answer the questions, we build in this paper a theoretical framework of three interconnected modules, in each of which we capture one feature of the Chinese political economy and analyze its implications on corruption. Module 1 concerns the economic institutions of crony capitalism. We assume that a local official, representing all civil or sometimes military officials who are at levels lower than the Party Center, has the resources and policy instruments to protect his crony firms in the private sector from distortionary regulations. We show that, given these distortionary regulations, if local officials are allowed by the Center to take more bribes, more private firms will be protected, leading to not only higher economic performance but also greater corruption rents at levels lower than the Center.

Module 2 focuses on the party-state hierarchy up to the provincial level. We show that superior officials who have personnel power over their subordinates can capitalize on this power by extracting the corruption rents from their subordinates. As a result, any marginal increase in the rents from crony capitalism will be diverted along the party-state hierarchy up to the provincial level.

Module 3 models the Center's choice of its tolerance of local corruption. We assume that not only does the Center benefit from the legitimacy given by the economic performance of crony capitalism, but it is also eager to be able to respond to potential crises that may threaten its power, including direct challenges to the collective power of the Center or the individual power of the incumbent paramount leader. The success of such responses will depend on cooperation from the provincial officials. Since a crisis that strikes the Center will give the provincial officials an opportunity to consolidate their vested interests, greater rents accumulated at this level threaten the Center's crisis response ability. The Center then faces a political-economic trade-off between this ability to respond to crises and economic performance when choosing its tolerance of local corruption. Since a general condition of the fat-tailed risk of crisis guarantees the dominance of the political side in this trade-off, the Center will always try to secure crisis control and political power at whatever economic cost. Reflected in the choice of the corruption tolerance, the Center will set it at the level that maximizes in priority its ability to manage crises that threaten its power, while promoting the economy will always take a secondary role.

This result implies that, despite serious economic costs, any perceived looming danger of crisis to its political power will make the Center wish to crack down on corruption to secure its control of the party-state hierarchy during any crisis. That said, nothing guarantees that such a wish will be carried out. To understand under what conditions a crackdown will happen, we extend Module 3 by assuming that a successful crisis response requires not only the provincial officials' cooperation, but also the consensus from each leader in the Center. Therefore, any attempt to secure control would be in vain if the Center is unable to reach a quick consensus when a crisis happens. A paramount leader will thus choose to consolidate his own power within the Center and optimally control corruption simultaneously. We may thus observe in reality that crackdown on corruption and power consolidation, for example via power struggles or streamlining within the Center, occur together.

Provincial officials emerge in our model as powerful players who can cumulate rents from corruption and threaten the Center's control in crises. A question thus arises naturally: why could the Party Center not always force provincial officials to comply, as the provincial officials are able to with the lower-level cadres? To answer this question, we go one step deeper by modeling the relationship between members of the Center and their provincial protégés, focusing on two features of the communist party-state. The first is the *reciprocal accountability* between the Center and provincial officials: as first analyzed by Shirk (1993), not only are provincial officials appointed by and accountable to the central leaders, but the central leaders also rely on the support from the provincial officials to stay in power. The second is the lack of reciprocal accountability below the provincial level: following the 1984–1995 cadre management reform (People's Daily, 1984; Burns, 1987, 1994; Central Committee of the Party, 1995; Pei, 2016, p. 35), only the local officials are accountable to their provincial superiors, but not the other way around. We show that the combination of these two features can limit the Center's ability to discipline provincial officials, while allowing the provincial officials to tread on the lower-level ones, leading to substantial rents being captured at the provincial level and threatening the power of the Center. We also show that given this institutional context, corruption within the Center can further damage its ability to discipline the provincial leaders.

Our analysis was certainly initiated by Xi's anti-corruption campaign since 2012, but it is purely positive, not normative, and should in no way be seen as providing legitimacy for the campaign. Without denying the political nature of the campaign (e.g., survey by Kautz, 2020 on related commentaries), our paper's focus is to improve our academic understanding of China's political economy. We contribute to the literature from at least three aspects. First, in the recent literature, a long list of empirical studies have examined Xi's anti-corruption campaign (e.g., Francois et al., 2016; Ding et al., 2017; Araral et al., 2018; Chen and Kung, 2019; Chen and Zhong, 2018; Lin et al., 2018; Lu and Lorentzen, 2018; Qu et al., 2018; Xi et al., 2018; Ying and Liu, 2018; Goh et al., 2019). To our knowledge, we are the first to provide a unified model of how crony capitalism leads corruption to seep into the higher ranks of the Communist Party, how this presents an existential threat to the Party-state, and under what conditions decisions to fight corruption may or may not take place, thus helping understand these empirical studies in a unified framework.

Second, in the recent literature on China's political economy, besides Xu (2011) and Bai et al. (2014, 2020), Francois et al. (2016) theorize how the factional balance is achieved within the leadership of the Party; Xie and Xie (2017) analyze the impact of different opinions within the Party leadership on the choice of reform strategies; Che et al. (2019) explore the cost of removing

leaders’ criminal immunity given the current Chinese political institution; Wang and Zheng (2019) analyze how the lack of safety of corruption rents at lower levels in the state hierarchy incentivizes officials to actively participate in the meritocratic promotion scheme; Shifa and Xiao (2019) and Wang (2021) analyze the implications of the government intervening in the land institutions and labor and capital markets, respectively, to maintain political support. Related but not limited to China, Li et al. (2022) model the corrosive impact of corruption on the power relationship inside a state apparatus. Our paper looks at the economic (crony capitalism) and political (party-state) spheres simultaneously, and we show the pivotal role of reciprocal accountability, a prominent institutional arrangement, limiting the fight against corruption inside the Chinese party-state hierarchy.

Third, a group of studies have emerged on the political economy of autocracy (e.g., surveys by Gehlbach et al., 2016; Egorov and Sonin, 2020). In the Chinese context, the focus has been mostly on the incentive structure, contentious politics, and reform experiences given the Chinese institutions (e.g., surveys by Xu, 2011, 2015, 2019; Lorentzen, 2017; Qian, 2017; Roland, 2018). Our analysis in this paper suggests that corruption can be pervasive in a country where there is crony capitalism and the state has great economic power. This can in turn lead to anti-corruption campaigns in anticipation of a looming crisis. Power consolidation within the state headquarters may happen simultaneously and be justified as preparation for future crisis responses. These implications contribute further to the literature by linking economic institutions, governance changes, and elite politics together.

The paper is organized as follows. Section 2 presents and analyzes the three modules and the extension of the model. Section 3 discusses the interpretation of the theoretical results. Section 4 analyzes collective decision-making inside the Center under reciprocal accountability. Section 5 concludes.

2. The model

Fig. 1 shows the overall structure of the model: Module 1 models the interaction between local firms and a local official, who represents all officials in the party-state who are not in the Party Center; Module 2 takes Module 1 as given and models the interaction between the local official and his provincial supervisor, who represents the officials in the Central Committee of the Party; Module 3 takes Modules 1 and 2 as given and models how corrupt the Party Center, i.e., the highest governing body of the Party – the Politburo Standing Committee – and in particular the incumbent paramount leader, will allow the local official to become. We now introduce and analyze the three modules one by one.

2.1. Module 1: Crony capitalism

Assume that there is a continuum of firms with a mass of 1 in a local official’s jurisdiction. Since the main driver of economic growth in China has been the private sector (e.g., Allen et al., 2005; Song et al., 2011; Xu, 2011; Guo et al., 2014), we assume that these firms are private firms, leaving the state-owned enterprises out of the model. Given the persistence of barriers to firm mobility and the prevalence of local protectionism in China (e.g., Wedeman, 2003; Bai et al., 2004, 2014, 2020; Zhou, 2004; Barwick et al., 2017), we assume that these firms are immobile.

We assume that each firm’s potential productivity or growth potential is 1. Because of existing economic distortions, such as red tape, inefficient regulation, and lack of access to credit (e.g., Brandt and Rawski, 2008), we assume that given the institutional inefficiencies, only an exogenous share $\alpha \in (0, 1)$ of the potential can be realized. At the same time, we assume that each firm has an opportunity to give an exogenous bribe b to the local official, in which case its full potential will be realized through privileges that non-crony firms would not enjoy, including, for example, being free from the barriers to entry for other firms, privileged access to government contracts, discounts on utility prices, and tax breaks. A lower α then denotes simultaneously more distortionary regulation and a greater power that the local official can have over the local economy. The bribe b can be interpreted as the highest level of bribes tolerated by the Party Center.¹

This setting highlights that the government’s economic power cultivated by regulatory distortions will lead to crony capitalism:

Lemma 1. *Firms will bribe the local official only when the existing regulation is sufficiently distortionary, i.e., $\alpha \leq 1 - b$.*

As crony capitalism is so prevalent in China that often all firms in a local jurisdiction would like to become a crony of the local official, to be empirically relevant, we assume hereafter that $\alpha \leq 1 - b$.²

On the side of the local official, we assume that his total cost of breaking rules and closing deals is $c\theta^2/2$, which is convex in θ , where $c > 0$ is an exogenous cost parameter. This specification is consistent with the fact that local officials’ time, energy, and other resources that can be devoted to making and fulfilling the special deals are limited.

Given all the assumptions, the local official’s program is to maximize his bribe earning θb net of its cost $c\theta^2/2$ by choosing the share $\theta \in (0, 1]$ of firms from which he will accept bribes:

$$\max_{\theta \in (0,1]} U_L(\theta; b, c) = \theta b - c\theta^2/2. \tag{1}$$

¹ As a micro-foundation for this interpretation, since there is an infinite number of firms, the firms can bid up the price of bribes up to its maximum tolerated level b .

² For example, sociologist Lin (2001, p. 6) argues that “[i]n the reform era, effective manipulation of state action – i.e., making gains from ad hoc favorable treatment by the state – constitutes a necessary condition for the success of firms”. On the ubiquity of firms trying to bribe local officials in China, anthropologist Osburg (2013, p. 52) quotes a Chinese government contractor: “[e]ven if you’re just a county head (*xianzhang*), there are literally thousands of businessmen lining up at your door to give you money”.

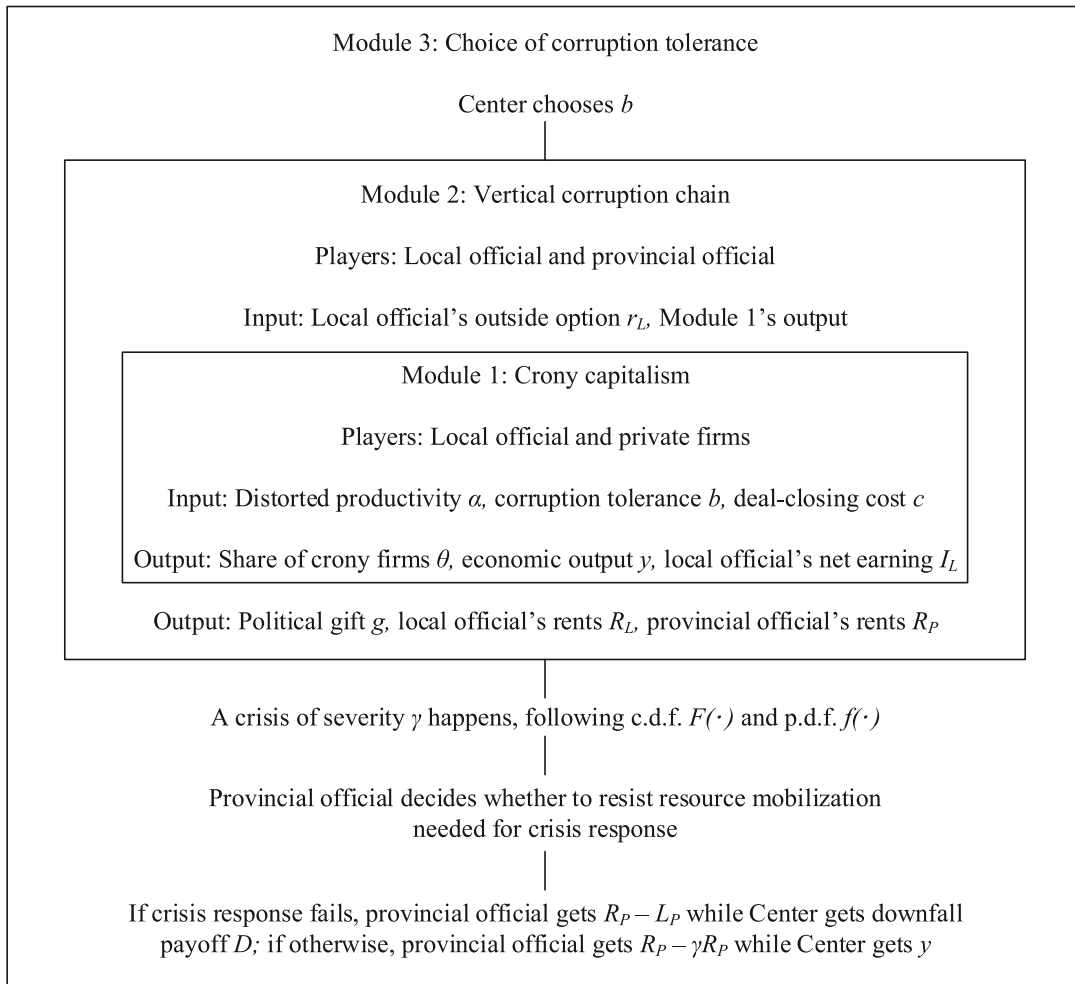


Fig. 1. The three modules of the model.

The first-order condition of this program is

$$b - c\theta = 0 \tag{2}$$

and the second-order condition, $-c < 0$, holds.

Since in reality not all firms are cronies, we assume that the cost intensity of the local official to close deals is so high, i.e., $c \geq b$, that an interior solution can be reached in equilibrium. By the first-order condition, the share of firms that become cronies in equilibrium is thus

$$\theta = b/c, \tag{3}$$

which is increasing in b and decreasing in c . Local economic output in equilibrium is then total output from all the firms,

$$y = (1 - \theta)\alpha + \theta = \alpha(1 - b/c) + b/c = \alpha + (1 - \alpha) \cdot b/c, \tag{4}$$

which is increasing in α and b and decreasing in c . The local official's net earning in equilibrium is then

$$I_L(b, c) \equiv U_L(b/c; b, c) = b^2/2c, \tag{5}$$

which is increasing in b and decreasing in c , too. The following proposition summarizes these results of Module 1:

Proposition 1. *In equilibrium, the prevalence of crony capitalism θ , economic output y , and rents of the local official I_L increase with b and decrease with c .*

Since a higher b and a lower c are equivalent in their positive effect on the prevalence of crony capitalism, economic output, and the local official’s rents, we call b the *corruption tolerance* and focus on its implications hereafter, always taking c as exogenous in our analysis.

Module 1 illustrates how crony capitalism creates corruption rents at the local level. To understand the full effects of such rents, we need to consider the interactions inside the party-state.

2.2. Module 2: The vertical corruption chain

We now consider the relation between the local official and his direct superior in the party-state hierarchy, a provincial official, who has the personnel power to remove him from the post. We assume that if the local official is removed, he will lose his opportunity to extract bribes from local firms but will receive instead an exogenous reservation payoff $r_L \geq 0$.³ The local official is assumed to have a chance to give a political gift, g , to the provincial official, in the hope of not being removed. If he is not removed, he will be able to use bribes received from his crony firms to finance this gift, enjoying the residual rents as his own consumption. We assume that there is no commitment problem in the local–provincial interaction, since both sides could always expose each other if one did not fulfill the transaction.

Given this setting, since the local official has a budget of $I_L(b, c) = b^2/2c$ and faces the reservation payoff r_L , if $b^2/2c \geq r_L$, the provincial official can thus demand a gift up to $g = b^2/2c - r_L$ and enjoy his rents $R_p = b^2/2c - r_L$, whereas the local official can be kept in the party-state, eventually enjoying his rents $R_L = r_L$; if $b^2/2c < r_L$ instead, the local official will refuse to pay any gift and leave the party-state, enjoying r_L . Therefore, for the local official to be willing to stay in the party-state system, the level of bribes that he is allowed to take in Module 1 must be sufficiently high:

Lemma 2. *To keep the local official in the party-state, the corruption tolerance b must satisfy $b \geq \sqrt{2cr_L} \equiv \underline{b}$.*

We also have the following result:

Proposition 2. *If the local official is retained, then the provincial official’s rents $R_p = b^2/2c - r_L$ increase with the corruption tolerance b .*

The intuition is as follows: any additional corruption rents at the local level are captured by the provincial power because of his personnel power; these additional rents thus go up through the vertical corruption chain along the hierarchy; therefore, a higher tolerance of corruption, i.e., a higher b , leads to greater rents R_p at the provincial level.⁴

2.3. Module 3: Choice of corruption tolerance

We assume that above the provincial official sits the Center of the Party-state. Not only would the Center like to raise economic output, but it also wants to be able to respond to random crises that challenge its power. These crises include primarily political ones, such as coups, revolts, secessions, and wars, but also the natural and economic ones that are sufficiently serious, such as a significant pandemic or a financial crisis. Responding to these crises may coincide with the interest of the general population, but the Center considers them primarily because they challenge its power.⁵

As recognized by the highest leaders of the Party, the Center’s ability to respond to crises depends crucially on its ability to mobilize provincial resources for a well coordinated response or initiative (e.g., Xi, 2014, 2017a, 2018). We thus denote the severity of the crisis as a random variable $\gamma \in [0, \bar{\gamma}]$, with which we assume that the Center will need to mobilize a share γ of the rents from the provincial official to respond to the crisis.⁶ The highest possible severity is denoted by $\bar{\gamma} \leq 1$.⁷ We denote the cumulative distributive and probability density functions of γ as $F(\cdot)$ and $f(\cdot)$, respectively, and we assume that $F(\cdot)$ is continuous.

Assume further that the provincial official will suffer an exogenous loss L_p if he refuses to submit the required rents so that the Center cannot successfully manage the crisis.⁸ In this case, the payoff to the provincial official would then be $R_p - L_p$. If instead he decides to submit the resources, the crisis will be successfully managed, and his payoff will be $R_p - \gamma R_p$.

Under these assumptions, given γ , the provincial official will resist the resource mobilization from the Center, if and only if

$$R_p - L_p > R_p - \gamma R_p. \tag{6}$$

³ The reservation payoff can be related to possibilities of getting jobs in the private sector. This means that the higher the development of the private sector, the higher the reservation payoff.

⁴ Given Lemma 2 and Proposition 2, one can interpret b as an incentive that the Center gives to local and provincial officials on an everyday basis. We thank a referee for that observation.

⁵ Veg (2019) discusses the influence of Schmitt (1921, 1922) in China in recent decades, which emphasizes the ability of the state to respond to crises.

⁶ One can also interpret γ as the random component of the level of control that the Center would like to impose over the provincial level in the party-state hierarchy. We thank a referee for suggesting the interpretation.

⁷ This setting of a relative severity of crisis provides tractability. One can verify that, given any crisis, the absolute amount of rents that the Center would need to appropriate in response to a crisis increases with economic output and, equivalently, with the total amount of the rents captured by the provincial official.

⁸ Since the Center’s failure to manage a crisis is an exceptional scenario, we find it not too controversial to assume that when deciding whether to resist the resource mobilization, the provincial official takes his loss in the exceptional scenario as an exogenous amount. Alternatively, if $L_p \equiv L(R_p)$, then all results in the model will hold, as long as the loss is not too sensitive to the corruption rents ($R_p \cdot L'(R_p)/L(R_p) < 1$).

By noting the link between the provincial official's rent R_p and the tolerance of local corruption b in Proposition 2, we can derive the following lemma:

Lemma 3. *The provincial official will resist the resource mobilization if and only if the crisis is sufficiently severe, i.e., $\gamma > L_p / (b^2/2c - r_L) \equiv \hat{\gamma}$, where $\hat{\gamma}$ is decreasing in the corruption tolerance b .*

We understand that in the Chinese context, first, because of the proclaimed ascetic values in the Chinese communist ideology and the lack of rule of law in the Chinese communist party-state, it is always deemed legitimate for the Center to regulate corruption whenever the Center deems it necessary, which can be achieved by campaigns, marked by intensive investigations, harsh punishments, extensive propaganda, and mobilization of the common people in short periods, thereby deterring local corruption.⁹ Second, the campaigns are not necessarily accompanied with any systematic reform in political economy. We thus consider the Center's choice of its tolerance of local corruption b before the crisis strikes, taking the institutional efficiency α in the economy as given.

About the relevant range of b , we have two considerations based on Modules 1 and 2. First, given the Chinese reality of crony capitalism, we assume that the Center will only consider a range of b such that the local economy always works as modeled in Module 1. This requires the existing regulation to be sufficiently distortionary ($\alpha \leq 1 - b$) and the local official's cost to close deals to be sufficiently high ($c \geq b$), i.e., $b \leq \min\{1 - \alpha, c\} \equiv \bar{b}$. Second, we assume that it would be disastrous to the Center if the local official decided to leave the party-state system in Module 2, as the Center would not be able to maintain the party-state apparatus even without any crisis. This requires $b \geq \underline{b}$. Given the two considerations, we have assumed that the Center will consider only $b \in [\underline{b}, \bar{b}]$. To prevent this range from being empty, we assume $\underline{b} \leq \bar{b}$, i.e., $\alpha \leq 1 - \sqrt{2cr_L}$ and $c \geq 2r_L$, which are consistent with the spirit of our assumptions for Module 1, again, that regulation is sufficiently distortionary and the local official's cost to close deals is sufficiently high.

About the payoff of the Center, we assume that the Center benefits from economic output $y = \alpha + (1 - \alpha) \cdot b/c$ when crises are successfully managed ($\gamma \leq \hat{\gamma}$), whereas it gets a sufficiently low payoff $D < \alpha$ for downfall when a crisis leads the Center to lose control ($\gamma > \hat{\gamma}$). We assume that the Center is risk neutral.

The Center's program is thus

$$\max_{b \in [\underline{b}, \bar{b}]} F(\hat{\gamma}) \cdot y + (1 - F(\hat{\gamma})) \cdot D, \quad \text{i.e.,} \quad \max_{b \in [\underline{b}, \bar{b}]} F(\hat{\gamma}) \cdot (y - D), \tag{7}$$

where

$$\hat{\gamma} = \frac{L_p}{b^2/2c - r_L} \quad \text{and} \quad y = \alpha + (1 - \alpha) \cdot b/c. \tag{8}$$

This program suggests that as long as surviving a crisis is better than losing power ($y > D$), which is guaranteed by the assumption that the downfall payoff is lower than the lowest possible economic output ($D < \alpha$), the Center will always face a fundamental trade-off between crisis control and economic performance: a higher b will lead to not only a higher output level y by Proposition 1, but also, by Lemma 3, a higher probability $1 - F(\hat{\gamma})$ of losing control when challenged by a crisis.¹⁰

We can then derive the following proposition:

Proposition 3. *If the distribution of the crisis severity is such that for any $\gamma \in (0, \bar{\gamma})$, $\epsilon \equiv \gamma \cdot f(\gamma) / F(\gamma) > 1/2$, then the Center's optimal corruption tolerance b^* follows: if $\sqrt{2c(L_p/\bar{\gamma} + r_L)} \leq \underline{b}$, then $b^* = \underline{b}$; if $\underline{b} < \sqrt{2c(L_p/\bar{\gamma} + r_L)} < \bar{b}$, then $b^* = \sqrt{2c(L_p/\bar{\gamma} + r_L)}$; if $\sqrt{2c(L_p/\bar{\gamma} + r_L)} \geq \bar{b}$, then $b^* = \bar{b}$.*

Proof. Since $F(\cdot)$ is continuous, the Center's objective function is continuous. We now examine its monotonicity. When $\hat{\gamma} \geq \bar{\gamma}$, i.e., when $b \leq \sqrt{2c(L_p/\bar{\gamma} + r_L)}$, crisis control is never compromised, so the objective function is increasing in b , just as the economic output y does, by Proposition 1.

When $\hat{\gamma} < \bar{\gamma}$, i.e., $b > \sqrt{2c(L_p/\bar{\gamma} + r_L)}$, however, there is a non-zero probability of losing control in a crisis. Observe that the first-order derivative of the objective function with respect to b is

$$\frac{1 - \alpha}{c} \cdot F(\hat{\gamma}) - \frac{L_p}{(b^2/2c - r_L)^2} \cdot \frac{b}{c} \cdot f(\hat{\gamma}) \cdot (y - D). \tag{9}$$

It will be negative, given $\hat{\gamma} = L_p / (b^2/2c - r_L)$ and $y = \alpha + (1 - \alpha) \cdot b/c$, if

$$\hat{\gamma} \cdot \frac{f(\hat{\gamma})}{F(\hat{\gamma})} \cdot \left(\frac{(1 - \alpha)b}{c} + \alpha - D \right) > \frac{(1 - \alpha)b}{2c} - \frac{1 - \alpha}{b} \cdot r_L, \tag{10}$$

⁹ On the tradition of ascetic values in the Chinese communist ideology, see Meisner (1968); on the campaign-style governance in China, see Zhou (2012).
¹⁰ At a more general level, the trade-off between growth/routine performance and control/discretionary power is consistent with the views of China scholars (e.g., Will, 1980; Huang, 1981; Kuhn, 1990; Zhou, 2008, 2012, 2017; Sng, 2014; Walder, 2015; Zhang, 2018).

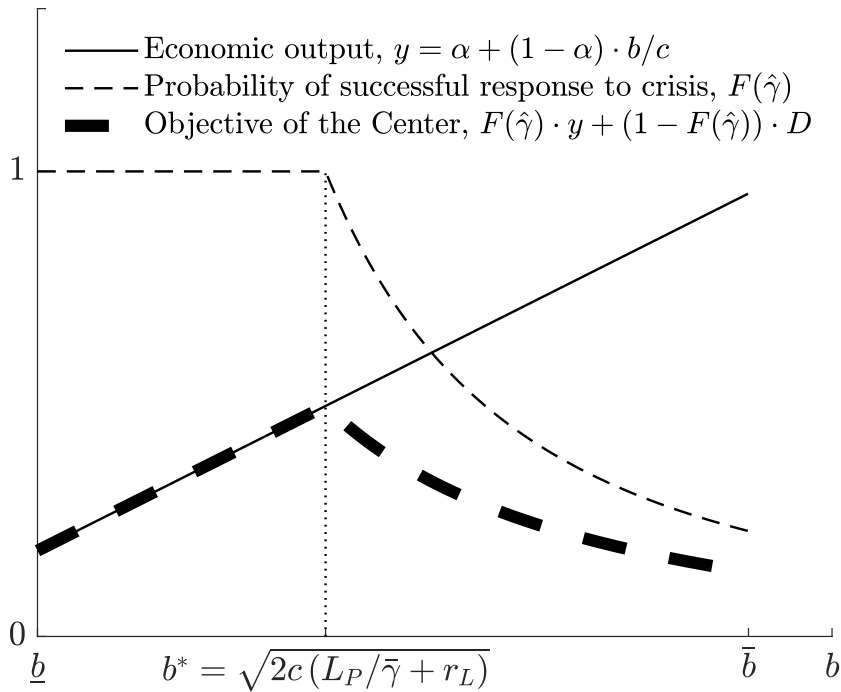


Fig. 2. Center's optimal choice of corruption tolerance b , b^* , given fat-tailed crisis risk ($\epsilon > 1/2$) and interior solution ($\underline{b} < \sqrt{2c(L_P/\bar{\gamma} + r_L)} < \bar{b}$).

which, when $D < \alpha$, is equivalent to

$$\epsilon \equiv \hat{\gamma} \cdot \frac{f(\hat{\gamma})}{F(\hat{\gamma})} > \frac{1}{2} \cdot \frac{(1-\alpha)b - 2c r_L(1-\alpha)/b}{(1-\alpha)b + c(\alpha - D)}. \tag{11}$$

Note that, when $D < \alpha$,

$$\frac{1}{2} \cdot \frac{(1-\alpha)b - 2c r_L(1-\alpha)/b}{(1-\alpha)b + c(\alpha - D)} < \frac{1}{2}. \tag{12}$$

Therefore, we can conclude that given $D < \alpha$, if $\epsilon > 1/2$ for any $\gamma \in (0, \bar{\gamma})$, then the Center's objective function is decreasing over $b > \sqrt{2c(L_P/\bar{\gamma} + r_L)}$.

Therefore, if $\epsilon > 1/2$, then the Center's objective function is increasing over $b \leq \sqrt{2c(L_P/\bar{\gamma} + r_L)}$ and decreasing over $b > \sqrt{2c(L_P/\bar{\gamma} + r_L)}$. The optimal choice b^* then follows comparing the relative levels of $\sqrt{2c(L_P/\bar{\gamma} + r_L)}$, \underline{b} , and \bar{b} . \square

The intuition of Proposition 3 is illustrated in Fig. 2. A higher corruption tolerance raises economic output, while a lower one increases the Center's control in crises until the Center never loses control in any crisis. Therefore, on the one hand, when the tolerance is so low that full security is reached ($b \leq \sqrt{2c(L_P/\bar{\gamma} + r_L)}$), the Center can always raise the tolerance to gain more economic output without sacrificing any security. On the other hand, the condition $\epsilon > 1/2$ means that the right tail or end of the crisis risk distribution is sufficiently fat. This condition suggests that, when corruption tolerance is still too high to secure control in all possible crises ($b > \sqrt{2c(L_P/\bar{\gamma} + r_L)}$), a lower tolerance would lead to a smaller output loss compared to the larger gain in crisis control. Therefore, the Center will set the corruption tolerance at such a level that crisis management ability always remains fully secured while output is maximized ($b^* = \sqrt{2c(L_P/\bar{\gamma} + r_L)}$), as long as this particular level is within the relevant range $b \in [\underline{b}, \bar{b}]$, as in Fig. 2. If this particular level is outside the relevant range, then the Center will set the corruption tolerance at one of the boundaries of the range, respectively.

Before discussing the implications of this proposition, one may wonder the role of the fat-tail condition ($\epsilon > 1/2$) in the result and the relevance of the condition. As shown in the proof, the trade-off between crisis control and economic output is indeed governed by the tail-thickness of the crisis risk; having a sufficiently fat-tailed distribution of crisis severity is also consistent with empirical evidence on crisis and the general approach in risk management when modeling crises (e.g., Taleb, 2007; Ackerman, 2017).¹¹ We will further discuss the relevance of the condition to the Chinese reality in Section 3.

¹¹ In Appendix, we provide an additional result that under a sufficiently thin-tailed crisis risk, the Center will sacrifice some crisis control for economic output, even when securing crisis control is possible.

Given the fat-tailed risk of crisis, Proposition 3 implies that a higher crisis risk can push the Center to crack down on corruption:

Corollary 1. *Following Proposition 3, the Center’s optimal corruption tolerance b^* is weakly decreasing in the crisis risk, represented by the greatest possible crisis severity $\bar{\gamma}$; strict monotonicity holds when b^* is an interior solution within $[b, \bar{b}]$.*

2.4. Extension: Power distribution within the center

So far we have treated the Center as a single player. In reality, the Center often consists of several central leaders and the power distribution among them can affect the Center’s ability to respond to crises. Notably, for a crisis response to succeed, not only must the mobilization of local resources succeed, but the central leaders must in the first place agree on an urgent response plan. If the Center is too fragmented, it could be paralyzed without any response plan, losing its crisis response ability. This feature is especially relevant in Chinese communist politics, as demonstrated by the two most challenging political crises that the Party has faced since the end of the Cultural Revolution — the political unrest in 1989 (Tiananmen Square protests) and the Bo Xilai scandal in 2012.¹² How would this feature shed light on the relationship between the power distribution within the Center, crisis response, and the Center’s effort to control corruption?

To investigate this question, we extend Module 3 by assuming that the Center has $N \geq 1$ leaders. We call $p_i \geq 0$ the power of leader i , which depends on his official ranking in the Center, where $\sum_{i=1}^N p_i \equiv P > 0$ is exogenous. We assume that when facing a crisis of severity γ , these leaders have a short time window to decide whether to mobilize the γ -share of the rents from the provincial official so that they could manage the crisis. We also assume that the crisis response will succeed 1) if the central leaders agree on the response and 2) if the provincial official cooperates. On the payoff of the central leaders, if the response succeeds, the Center will survive and each leader will, according to his relative power in the Center, get his share p_i/P of the economic output $R(b) \equiv y$ in Module 1; when the response fails, each leader will receive instead the downfall payoff D as in Module 3.

Given that in the Chinese context important decision-making in the Party Center usually requires consensus (at least before Xi’s ascent to power, e.g., Shirk, 1993; Huang, 2000; Vogel, 2005; Xie and Xie, 2017), we assume that when the Center decides on the crisis response, the response will be taken only by consensus of all the central leaders, regardless of each leader’s power p_i .¹³

Under these assumptions, a successful crisis response requires $R(b) \cdot p_i/P \geq D$ for all i , which will be the case if $\min_i p_i/P \geq D/R(b)$, i.e., the Center is so streamlined that even the weakest central leader has a sufficient stake in the status quo and, therefore, is willing to approve the response. Therefore, this extension imposes an additional constraint on the power distribution for the success of a crisis response:

Lemma 4. *A crisis will be successfully managed if and only if it is not so severe and the Center is sufficiently streamlined, i.e., $\gamma \leq \hat{\gamma}$ and $\min_i p_i/P \geq D/R(b)$.*

Given this constraint, how would the paramount leader, who chairs the Center and is denoted by $i = 1$, set the corruption tolerance b , the Center’s size N , and the distribution of power p_1, \dots, p_N at the same time, if he has the ability to do so? The paramount leader’s program is thus

$$\max_{b, N, p_1, \dots, p_N} \left(F(0) + (F(\hat{\gamma}(b)) - F(0)) \cdot \mathbf{1}_{\min_i p_i/P \geq D/R(b)} \right) \cdot (R(b) \cdot p_1/P - D), \tag{13}$$

where

$$b \leq b \leq \bar{b}, \quad N \geq 1, \quad \sum_{i=1}^N p_i = P, \quad p_i \geq 0, \quad i = 1, \dots, N, \tag{14}$$

$$\hat{\gamma}(b) \equiv \frac{L_P}{b^2/2c - r_L}, \quad R(b) \equiv y = \alpha + (1 - \alpha) \cdot b/c,$$

and $\mathbf{1}$ is an indicator function.

The following proposition describes the solution:

Proposition 4. *If for any $\gamma \in (0, \bar{\gamma})$, $\epsilon > 1/2$ as in Proposition 3, then the paramount leader will choose a dictatorship, i.e., $N = 1$ and $p_1 = P$, and then control corruption by choosing $b = b^*$, where b^* follows the solution in Proposition 3.*

¹² As Shirk (2018, p. 30 and 33) states, in the spring and summer of 1989, the Party leaders “split on how to respond” to “the widespread unrest”, and “open divisions at the top drove the political system to the brink of collapse;” “on the eve of Xi’s 2012 ascension to power”, “[t]he leadership split ... under collective leadership”, and “[n]either Hu nor the Standing Committee as a whole had the gumption to stop Bo’s open campaigning for power”, which eventually failed only thanks to the dramatic turn around the murder of Neil Heywood (Gracie, 2017).

¹³ This suggests that a leader who has $p_i = 0$ would still be able to veto a decision because of his presence in the Center. Therefore, not only the series $\{p_i\}_1^N$ but also the number of central leaders N affect the decision-making process. The consensus requirement is instrumental in building a united image of the Party leadership, legitimizing the single-party authority. The disastrous outcomes in Mao’s last years also reminded the leaders of the danger of personalistic rule. For more discussions on the consensus requirement, see Shirk (1993), Huang (2000), and Xie and Xie (2017).

Proof. Note that, given any corruption tolerance b , the paramount leader would like to maximize his own survival payoff, i.e., his share of rents p_1/P . At the same time, he would also like to maximize the likelihood that all central leaders would be able to agree on a crisis response, i.e., to maximize the power of the Center's lowest ranking member $\min_i p_i/P$. Since a dictatorship ($N = 1$) implies $p_1/P = \min_i p_i/P = 1$, it solves the two maximization problems simultaneously and is thus optimal for the paramount leader. As a dictator, the paramount leader's program is then reduced to the Center's program in formerly modeled Module 3, with the Center being the paramount leader himself. The solution in Proposition 3 then follows. \square

One may wonder whether the result of a dictatorship ($N = 1$) comes only from the fact that it maximizes the paramount leader's share of rents. The answer is no. To see this point, suppose that the paramount leader chooses $N > 1$ while $p_i = 0$ for any $i \neq 1$. This institution would maximize the paramount leader's share of rents, i.e., $p_1/P = 1$, but it can leave the Center paralyzed during crises, since the Center-streamlining condition $\min_i p_i/P \geq D/R(b)$ would become $0 \geq D/R(b)$ and not hold in case $0 < D < \alpha$. Therefore, the power consolidation by the paramount leader in Proposition 4 does result from the Center-streamlining requirement of the crisis response.

Proposition 4 implies that, for the purpose of crisis control, any effort to limit corruption may be meaningful only when the Center is sufficiently streamlined. There is thus a complementarity between corruption control and power consolidation within the Center. It is thus reasonable to expect an anti-corruption campaign and a streamlining of the Center to happen simultaneously when the paramount leader has an opportunity to alter the power structure within the Center. We will discuss the relevance of this implication in the Chinese context in Section 3.4.

3. Interpretation of the results

We now discuss the interpretation of the theoretical results in Section 2 and their usefulness in understanding recent observations about the Chinese politics and economy.

3.1. Role of corruption in the Chinese economy

Proposition 1 in Module 1 implies a complementarity between corruption and economic growth under crony capitalism in China. This result is in line with Bai et al. (2014, 2020), where heterogeneity in firm productivity is introduced. Intuitively, since the existing distortion is severe, crony firms and local officials are both willing to engage in corruption, because they benefit from the higher productivity brought by the privileged relationship and from the rents by taking bribes, respectively. As corruption exempts the crony firms from inefficient regulations, it reduces the economic distortion, thereby enhancing economic performance. In other words, following the tradition of Leff (1964) and Huntington (1968), corruption “greases the wheels” of the economy.

Proposition 1 is consistent with empirical evidence that in Xi's anti-corruption campaign since 2012, “officials with better economic performance were more likely to be investigated” (Xi et al., 2018). It is also estimated that the campaign has slowed down economic growth, investment, and business entries (e.g., Araral et al., 2018; Chen and Zhong, 2018; Qu et al., 2018). As an anecdote in the same spirit, Premier Li Keqiang stated in a 2014 State Council executive meeting that since the campaign many local officials had been shirking their duties to evade being suspected of corruption (State Council of China, 2014).

That said, Proposition 1 does not imply that corruption is the fundamental driver of economic growth in China. On the contrary, in the proposition, the complementarity between corruption and growth exists only when the existing regulation is sufficiently distortionary, i.e., $\alpha \leq 1 - b$; if otherwise, by Lemma 1, paying the bribe would not be beneficial to firms, and any corruption between the local official and the firms would be detrimental to the economy.

Along the same line, in our model, the first-best solution to promoting economic growth is to dismantle distortionary regulations, rather than simply tolerating corruption. As Eq. (4) shows, the economic output y increases with the regulatory efficiency α . This is consistent with the fact that some of the Party leaders, such as Premier Li Keqiang (2015), understand that “sustaining steady and sound development” requires “deepening reform” (raising α) to tackle the “systemic, institutional ... problems” (low α). That said, the reform has always been “even more difficult than ... assaulting a fortified position” (Xinhua News Agency, 2013), and Li has openly complained that many directives from the State Council to cut red tape (raising α) were “obstructed in transmission” and could not be implemented at the local level (State Council of China, 2014). We will come back to this point in Section 3.3.

3.2. Corruption along the party-state hierarchy

Proposition 2 in Module 2 implies that a vertical corruption chain will emerge along the party-state hierarchy up to the provincial level given crony capitalism in the Chinese economy and the personnel power of the direct supervisor. This implication is consistent with observations that personnel power generates huge rents in areas where firm–official corruption pervades, as extensively discussed by sociologists and political scientists, such as Zhu (2008), Zhou (2013), and Pei (2016). The anti-corruption campaign since 2012 has also exposed widespread vertical collusive corruption among officials along the personnel hierarchy of the party-state, including buying and selling of positions, regardless how selective the exposure may have been (e.g., Lu and Lorentzen, 2018).

Guided by the implication and observations, we explore the data of corruption indictments from 2012 to 2015 in China collected by Lu and Lorentzen (2018). As space is limited, we leave the detailed results in Li et al. (2019). To summarize, across provinces, first, the number of corruption indictments at the level of provincial party secretaries and governors is significantly correlated with that of indictments at the lower levels; second, the correlation is driven by the correlation between the higher-level indictments and the indictments at the ranks directly below them; finally, the pattern is robust with respect to the administrative scale of the province. These results are consistent with Proposition 2 and Module 2.

3.3. Crisis response, reform, and motives and features of Xi's anti-corruption campaign

Lemma 3 in Module 3 implies that local corruption can threaten the ability of the Center to respond to a crisis or engage in an urgent reform due to resistance from the corrupt party-state machine, i.e., a higher corruption tolerance b increases the vested interests R_p of the provincial official and, therefore, lowers the critical threshold $\hat{\gamma}$ for provincial cooperation. In other words, local corruption creates incentive misalignment between the Center and the provincial official when the Center urgently needs cooperation from him.

This incentive misalignment is widely considered as one of the primary problems that corruption can cause in the Chinese communist politics (e.g., [Pei, 2016](#)). The highest leaders of the Party have also recognized it. For example, [Xi \(2015, 2016\)](#) has warned repeatedly about the link between corruption and high-level officials violating the central directives, cultivating “independent kingdoms”, or acting independently.

Lemma 3 is also consistent with the fact that the Party Center often finds it extremely difficult to improve institutional efficiency without first reducing corruption. It is because, according to Premier Li Keqiang, systematic reform would “touch vested interests” ([Xinhua News Agency, 2013](#)). According to the [World Bank \(2021\)](#), China’s “ease of doing business” score has also started rising rapidly since 2019, about two years after the end of the first round of Xi’s anti-corruption campaign, not before, during, or even right after it, reflecting not only less corruption but also some general improvement in institutional efficiency. Consistent with **Lemma 3**, this improvement can be interpreted as made possible by the anti-corruption campaign.

Following **Lemma 3**, **Proposition 3** implies that, if the risk of crisis is sufficiently fat-tailed, the Center will follow a lexicographic rule when choosing the optimal corruption tolerance: control comes first, while the economic output is maximized only once control has been maximized. The condition of the fat-tailed risk, discussed in Section 2.3 as quite general, is especially relevant in the Chinese context. For example, the term “black swans”, which is distinctively associated with the fat-tailed risk (e.g., [Taleb, 2007](#)), has been often used when the Party Center addresses the “major risks” it faces in a wide spectrum of realms ([People’s Daily, 2019](#)), which, taken at face value, indicates the Center’s mindset about the risks.

The predicted lexicographic rule of **Proposition 3** is consistent with the Party’s “repeatedly emphasized” principle in developing the Chinese economy – “[social and political] stability overrides everything, and we must not relax the democratic dictatorship of the People”, as stated by [Deng \(1993, originally 1990, p. 364\)](#). It is also consistent with [Xi \(2014\)](#)’s obsession for “security” – “[we] must insist on a holistic view on national security, acknowledging the people’s security as our mission, political security the fundamental, economic security the basic, military, cultural, and social security the safeguard, and international security the support, paving a path to national security with Chinese characteristics”. Being a *result* of our model and not an *assumption*, **Proposition 3** thus explains why Chinese Communist leaders give absolute priority to their objective of securing political control, regardless of the economic costs.

The corollary of **Proposition 3**, **Corollary 1**, finally implies that any perceived rise in the risk of crisis, i.e., an increase in $\bar{\gamma}$, could push the Center to cover the additional risk by cracking down on corruption, i.e., to choose a lower b^* . Recall that observers have noted that enormous challenges that had not been so alarming around the 17th Party Congress (2007) were mounting on all fronts against the Party Center’s power up to the 18th Party Congress (2012), and the situation was also not helped by the Bo Xilai scandal (e.g., [Fewsmith et al., 2012](#); [Mertha, 2012](#)). One may thus read the anti-corruption campaign since 2012 as a bid of the Party Center or Xi himself to secure crisis control facing these mounting challenges to their power.¹⁴

The logic of Module 3, **Lemma 3**, **Proposition 3**, and **Corollary 1** is also consistent with some prominent features of the campaign. First, if the goal is to consolidate control by reducing corruption rents in the whole system, then the campaign must have broad enough coverage and penetrate thoroughly the party-state hierarchy with great intensity. The mostly exhibitive show trials in the past that were primarily to pacify the popular anger for corruption or deter potential defiance, like the cases of Chen Xitong and Chen Liangyu, would not suffice.¹⁵ Consistently, [Francois et al. \(2016\)](#) estimate that the share of each faction among the indicted high-ranking officials generally corresponds to the faction’s overall representation in the Party leadership, and [Lu and Lorentzen \(2018\)](#) document that the officials who were disciplined were not limited to the high-level ones.

Second, because the corruption rents flow along the party-state hierarchy through personnel decisions up to the provincial level and threaten the Center’s control from there, the Party Center must destroy patronage networks in personnel management within each province to regain control. This is consistent with empirical evidence: for example, [Lu and Lorentzen \(2018\)](#) and [Goh et al. \(2019\)](#) document that investigations have targeted large patronage networks among officials and deviations from the meritocratic criteria in promotion practices in a few provinces; [Lu and Lorentzen \(2018\)](#) document that corrupt officials’ ties to top leaders have not provided much protection, except for those close to Xi, leaving the Party leadership, i.e., Xi, monopolizing the personnel network. The latter fact also reminds us that power is at the core of the character of the campaign.

Finally, as economic problems warn about potential crises, it is natural for the campaign to respond to economic problems associated with corruption and for the stock market to react generally positively in the short run to the campaign, as documented by empirical studies (e.g., [Ding et al., 2017](#); [Chen and Kung, 2019](#); [Lin et al., 2018](#); [Lu and Lorentzen, 2018](#); [Goh et al., 2019](#)). Given the difficulty in structural reforms and the resulted political-economic trade-off in the corruption tolerance, it is unsurprising to see further economic costs being paid because of the anti-corruption campaign (e.g., [Araral et al., 2018](#); [Qu et al., 2018](#); [Xi et al., 2018](#)).

¹⁴ This reading happens to be consistent with the Party narrative since 2012. For example, in his report to the 19th National Congress of the Party, [Xi \(2017b\)](#) stated: “confronting the crucial tests of enormous risks faced by the Party ... we cracked down on corruption, wiping out significant hidden hazards from the inside of the party-state”. In particular, framing corruption as “hidden hazards” matches the logic of Module 3: the threat of corruption to the control of the Center is “hidden” and matters only when control is urgently needed, i.e., in a crisis.

¹⁵ We thank a referee for suggesting the cases.

3.4. Political change within the party center and timing of the anti-corruption campaign

Proposition 4 implies that not only will the paramount leader control corruption following the lexicographic rule in **Proposition 3**, but he will also streamline the Center and consolidate his own power as much as possible. This implication is consistent with the developments in Chinese communist politics synchronous to the anti-corruption campaign since 2012. For example, the number of members of the Politburo Standing Committee has decreased from nine under Hu Jintao (2002–2012) to seven in Xi’s era; as **Shirk (2018, p. 32)** observes, “[u]nder Hu, the general secretary was only first among equals”, while Xi has successfully carried out a series of institutional reforms within the Center to consolidate his own power (**Li, 2016; Tsai and Zhou, 2019**). Due to these efforts, the Center’s power has become less fragmented, and personalistic rule has almost been achieved (**Shirk, 2018**), up to the point that recent developments, including the abolishment of the term limit of the state’s Presidency (NPC of China, **2018; Wang, 2018**), have clearly suggested that Xi will break the post-1989 norm that one should not serve as the paramount leader for more than ten years (**Fewsmith, 2018; McGregor et al., 2018; CCCPC, 2021**).

Proposition 4 also implies that optimal control over corruption can secure control in potential crises only when the Center is sufficiently streamlined, which, in the first place, depends on the opportunity that the paramount leader gets to consolidate his power within the Center. This implication explains the timing of the recent anti-corruption campaign. Before Xi’s era, the Center was more than often fragmented (**Shirk, 2018**), so cracking down on corruption would not help prepare much for crisis response. It was only in Xi’s first General Secretary term, “Jiang Zemin [was] hobbled politically by age”, whereas “Hu Jintao, a far more self-effacing figure than Jiang, [stayed] out of Xi Jinping’s way”, symbolized by his stepping down from the Central Military Commission of the Party right when Xi took the General Secretary position, and “there [was] no pre-appointed successor with whom Xi must share the elite’s loyalty” (**Shirk, 2018, p. 30–33**). These conditions created a rare window for Xi to consolidate his power. Starting from this window, the anti-corruption campaign and power consolidation have been closely complementing each other.

4. Reciprocal accountability

In our model, provincial officials are especially powerful in the party-state system and can threaten the control of the Center if they are too corrupt. In this section, we go deeper by investigating why this is the case. Why may members of the Center resist a collective decision to discipline a provincial official for corruption, non-cooperation in resource mobilization, or other non-compliant behaviors?

4.1. Power of provincial officials

When examining the Chinese party-state system, an important feature stands out: the reciprocal accountability between the central leaders and provincial officials. As documented by **Shirk (1993)**, not only do the central leaders hold provincial officials accountable through the party hierarchy, but provincial officials also hold the central leaders accountable because, in political struggles inside the Center, each central leader counts on his support base among provincial leaders. This reciprocal accountability is not surprising, given that (1) provincial officials occupy about half of the Central Committee of the Party, which elects the Politburo and its Standing Committee, and that (2) central leaders are at the very top of the party hierarchy so they have no higher authority to appeal to, other than their direct subordinates, i.e., the provincial officials.¹⁶ As **Shirk (2018, p. 32)** states, “[u]nder reciprocal accountability, these [provincial] officials [in the Central Committee] are not mere agents of the Party center”.

Would this reciprocal accountability prevent the Center from being able to discipline non-compliant provincial officials whenever it wants? We start by modeling a hypothetical case in which provincial officials do not hold central leaders accountable, and then compare it with the more realistic case in which they do hold them accountable.

When provincial officials do not hold central leaders accountable. As in Section 2.4, we still assume that each central leader has his *de jure* power $p_i \geq 0$, determined by the official ranking in the Party, where $P \equiv \sum_i p_i > 0$ is exogenous. We assume that they share an exogenous amount $R > 0$ of rents among them, and each of them gets a share p_i/P . Under what condition would each leader inside the Center be willing to purge a non-compliant provincial official, accusing him of corruption and bringing in his rent, $b^2/2c - r_L$, to share among the leaders?

Each central leader would support the removal, if and only if the payoff from doing so is not lower than the status quo payoff, i.e.,

$$\frac{p_i}{P} \left(\frac{b^2}{2c} - r_L + R \right) \geq \frac{p_i}{P} \cdot R. \quad (15)$$

This condition will always hold, given that local officials are staying in the hierarchy, i.e., $b \geq \underline{b}$ or $b^2/2c - r_L \geq 0$. Therefore, all central leaders would always support disciplining any non-compliant provincial official, and the rents created by crony capitalism would eventually flow to the Center.

¹⁶ **Shirk (1993)** documents how provincial officials can wield power over central leaders. For example, Deng Xiaoping withdrew his proposal to promote Zhu Rongji to the PSC after he met strong resistance from the Central Committee.

When provincial officials do hold central leaders accountable. Assume now that each central leader i has $m_i > 0$ provincial officials as his protégés, where we denote the total number of provinces as $M \equiv \sum_i m_i$, which is exogenous. Thus, his *de facto* power in the Center is $p_i + m_i$, and his share of the central rents is $(p_i + m_i)/(P + M)$.

Under these assumptions, this central leader will block disciplining one of his own protégés, if and only if

$$\frac{p_i + m_i - 1}{M + P} \left(\frac{b^2}{2c} - r_L + R \right) < \frac{p_i + m_i}{M + P} \cdot R. \tag{16}$$

Comparing this condition with Condition (15), without reciprocal accountability, each central leader cares only about his *de jure* power, and disciplining provincial officials will not affect that power, i.e., p_i/P appears on both sides of (15); when reciprocal accountability does exist, each leader depends additionally on his provincial support, so removing one of his protégés will weaken his *de facto* power, decreasing his share of the Center’s rents from $(p_i + m_i)/(M + P)$ to $(p_i + m_i - 1)/(M + P)$, as seen in Condition (16). Therefore, with reciprocal accountability, the leader has an incentive to protect his protégés.

To see this point more clearly, Condition (16) is equivalent to

$$R > (p_i + m_i - 1) \left(\frac{b^2}{2c} - r_L \right) \equiv \bar{R}. \tag{17}$$

This inequality could still hold if R is sufficiently large or $p_i + m_i$ is sufficiently small, even when local officials are staying in the hierarchy, i.e., $b \geq \underline{b}$ or $b^2/2c - r_L \geq 0$, a condition under which the disciplining would have always happened if reciprocal accountability did not exist. To summarize:

Proposition 5. Without reciprocal accountability, central leaders can always discipline non-compliant provincial officials, as long as local officials are staying in the hierarchy, i.e., $b^2/2c - r_L \geq 0$. Given this condition, with reciprocal accountability, instead, each central leader will protect his protégés, if the Center’s rent is sufficiently large, i.e., $R \geq \bar{R}$, where \bar{R} is increasing in the leader’s *de jure* power p_i .

Implications. Proposition 5 implies that the weaker the leader is inside the Center *de jure* (lower p_i), the more actively he would protect his own protégés (lower \bar{R}). This implication is consistent with the observation that Zhou Yongkang, who was the lowest in the official ranking of the Politburo Standing Committee, actively protected Bo Xilai, who had gained enormous popularity across the country as the Party Secretary of Chongqing, through the so-called “political activities beyond the Party organization” (e.g., Broadhurst and Wang, 2014; Zhou, 2015; Shirk, 2018).

The analysis above explains how reciprocal accountability between the Center and provincial officials can prevent the Center from using personnel power to reap rents from provincial officials and disciplining them. It also illustrates why provincial officials can reap rents from local officials. Announced in *People’s Daily* 1984, the 1984 cadre management reform “replaced the two-level down principle with one-level down”, granting provincial and local officials personnel authority over their immediate subordinate (Burns, 1987, p. 49). As observed by Pei (2016, p. 35), after some back-and-forth between 1985 and 1994 (e.g., Burns, 1994 on the 1990 adjustment), “the full institutionalization of this far-reaching reform” was eventually settled by the Central Committee of the Party 1995. Each level of the party organization along the hierarchy then behaved like the hypothetical case we have discussed where the subordinates cannot hold their supervisors accountable. The supervisors can thus force the subordinates to surrender their rents, and the rents are eventually reaped along the party hierarchy up to the provincial level. Therefore, the combination of 1) reciprocal accountability between the central and provincial officials and 2) the lack of it below the provincial level in the hierarchy causes any additional rents created by crony capitalism to be captured at the provincial level, threatening the Center’s power.

4.2. A corrupt center

So far we have analyzed corruption below the top of the hierarchy, assuming that central leaders are clean. This assumption can be challenged, especially in light of the indictment of Zhou Yongkang, a member of the Politburo Standing Committee between 2007 and 2012, who protected corrupt officials in exchange for a great amount of wealth. Chen and Kung (2019) also document that, in the primary land market, provincial officials gifted massive price discounts to firms linked to central leaders in exchange for promotion to the national leadership. A question arises naturally: how would corruption in the Center affect the disciplining ability of the Center and its interaction with provincial officials?

Assume that the central leader i receives an exogenous amount of bribe, $e > 0$, from each of his protégés; each protégé finances this bribe from his corruption rents $R_p = b^2/2c - r_L$. Further assume that the central leader does not share this bribe with the other leaders; disciplining one of his protégés will, however, force the central leader, under the pressure from other central leaders, to share this protégé’s bribe and all the rest of this protégé’s rents within the Center.

Under these assumptions, the leader will protect the protégé if and only if

$$\frac{p_i + m_i - 1}{M + P} \cdot \left(\frac{b^2}{2c} - r_L + R \right) + (m_i - 1)e < \frac{p_i + m_i}{M + P} \cdot R + m_i e. \tag{18}$$

This condition differs from Condition (16) only in that it features the newly introduced bribes, i.e., $(m_i - 1)e$ and $m_i e$, respectively, on each side. This condition can be rewritten as follows:

$$R > (p_i + m_i - 1) \left(\frac{b^2}{2c} - r_L \right) - (M + P)e \equiv \bar{R}_{\text{Corrupt Center}}. \tag{19}$$

Comparing Condition (19) with the condition without corruption, i.e., Condition (17),

$$R > (p_i + m_i - 1) \left(\frac{b^2}{2c} - r_L \right) \equiv \bar{R}_{\text{Uncorrupt Center}}, \quad (20)$$

we can formulate the following proposition.

Proposition 6. $\bar{R}_{\text{Corrupt Center}} < \bar{R}_{\text{Uncorrupt Center}}$ i.e., corruption in the Center makes it more difficult for the Center to discipline non-compliant provincial officials.

The intuition of Proposition 6 is that the central leader has to sacrifice his private gain of bribes when his protégés are removed, which makes the removal less attractive to him.

Implications. Proposition 6 suggests that corruption in the Center can greatly damage the disciplining ability of the Center, especially given the consensus requirement for important decision-making in the Party Center (Shirk, 1993; Huang, 2000; Vogel, 2005; Xie and Xie, 2017), since one corrupt leader can almost on his own block disciplining measures towards his protégés. This is consistent with the observation that only one corrupt Zhou Yongkang sufficed to paralyze the Politburo Standing Committee from taking any serious disciplining measures against his corrupt protégés (e.g., Cohen, 2013; Shirk, 2018).

A corollary concerns the case of an extremely corrupt Center, i.e., when e is sufficiently large:

Corollary 2. If $e > \bar{e}$ where $\bar{e} \equiv \frac{(\max_i \{p_i + m_i\} - 1)(b^2/2c - r_L)}{M + P}$, then $R > \bar{R}_{\text{Corrupt Center}}$ will always hold and the central leaders will always protect their own protégés.

This result comes from the fact that extreme corruption at the Center would imply $\bar{R}_{\text{Corrupt Center}} \leq 0$ for any central leader. In this case, given the consensus requirement for personnel disciplining, the Center will lose all of its *de facto* personnel power. In other words, absolute corruption in the Center corrupts its power absolutely. In light of this, for the Center to secure political control, not only does it require a real reduction of rents at the provincial level, but it also requires a real reduction of the corruption within the Center. This implication is consistent with Chen and Kung (2019)'s evidence of a more than 30% reduction in corruption “in the provinces either targeted by the central inspection teams or whose party secretary was replaced by one appointed by Xi”, where corruption is measured by the price discount enjoyed by “firms linked to members of ... the Politburo” in the primary land market.

5. Concluding remarks

In this paper we provide a theoretical framework that puts together in a single model crony capitalism, the party-state hierarchy, and the decision making of the leadership of the Chinese Communist Party. Although the sequential exposition of the three modules may give the impression that corruption is a bottom-up phenomenon, it should be clear that the logic behind corruption in our model is top-down: it is the Center who decides on the boundaries of corruption at the local level, which determines how well the Center can control the party-state in potential crises that threaten its power, how much the Center will benefit from the efficiency-enhancing effect of corruption in a second-best setting, and how the corruption rents will be distributed along the party-state hierarchy.

Our model helps understand the existential threat presented by corruption within the apparatus of the Party-state. A key insight from the model is that when the Party leadership faces a commonly fat-tailed risk of crisis, its political concerns will dominate the economic ones. The extension of the model suggests that any attempt to crack down on corruption and keep control over the apparatus of the Party-state can be meaningful only when the Center is sufficiently streamlined. Analysis on the reciprocal accountability between central leaders and provincial officials further explains the latter's rise as powerful players in the party-state, threatening the Center's control of the system, which is especially true if corruption has reached the top level of the Party leadership.

A common reading of Xi's anti-corruption campaign is that the campaign is a purge to reallocate power and rents to Xi's loyalists and to deter potential defiance, where the notion of anti-corruption serves as the justification for such a purge. This reading is consistent with the Party's practice in its history, for example, in the Yan'an Rectification Movement (Gao, 2018, p. 649). It is also consistent with the empirical evidence that the campaign has been sparing Xi's personal associates (e.g., Lu and Lorentzen, 2018), and with the observation that there are cases where associates of former leaders of the Party were taken down.¹⁷ Our analysis does not rule out this reading.

At the same time, we think it would be wrong to deny that corruption is an existential threat to the Party-state and that a minimum control over corruption is necessary in order to keep the Communist Party in power. Think about the following questions: one the one hand, how can Xi be sure that the loyalists he put in place will not defy him when an exceptional crisis weakens his paramount position, especially given that they will then have cumulated significant power and rents? On the other hand, if one assumes that Xi is sure that his loyalists will not betray him, then why would Xi need to render power and rents to them in exchange for support in the first place?

Note that in our model, whether the officials in the party-state will comply with the Center in a crisis is endogenous. In a simple extension of the model, we can show that, since the Center's associates are identified with the Center by others, they face a lower

¹⁷ A referee suggests the cases of Wu Xiaohui and Xiao Jianhua, who are alleged associates of the families of Deng Xiaoping and Zeng Qinghong, respectively. We thank the referee for the information.

reservation payoff when the Center falls, making their corruption less threatening to the Center’s power. The Center can thus allow them to be more corrupt than others because of this, even without the consideration to exchange for support.¹⁸

We have not explored in our model some other interesting features of corruption. For example, an official could expose his own corruption to his supervisor, creating a commitment device for himself to the supervisor in exchange for a confidant relationship and more rent-seeking opportunities. Also, collusive corruption between officials can create mutual trust and protection between them, since both know that once one of them is indicted, he will expose the wrongdoing of the other.¹⁹ These can be directions for future research.

Our research also highlights that the exact interaction between economic cronyism and corruption in autocracies relies on the institutional arrangements in the economy and in the political sphere. One would expect that the economic and political effect of corruption to vary according to these institutional arrangements, for example, differing across the regionally decentralized authoritarian/totalitarian system in China and other authoritarian systems. Our analysis of the special case of China is only a first step in that direction.

Appendix. Thin-tailed risk of crisis

Proposition 7. Consider the case of interior solutions in Proposition 3, i.e., $\underline{b} < \sqrt{2c(L_P/\bar{\gamma} + r_L)} < \bar{b}$. If the distribution of the crisis severity satisfies that $\epsilon \equiv \gamma \cdot f(\gamma) / F(\gamma) < \underline{\epsilon}$ holds for any $\gamma \in (\underline{\gamma}, \bar{\gamma})$, where

$$\epsilon \equiv \frac{1}{2} \cdot \frac{\sqrt{L_P/\bar{\gamma} + r_L} - r_L / \sqrt{L_P/\bar{\gamma} + r_L}}{\sqrt{L_P/\bar{\gamma} + r_L} + \sqrt{c(\alpha - D)} / \sqrt{2(1 - \alpha)}} < \frac{1}{2} \tag{A.1}$$

and $\underline{\gamma} \geq 0$ is given, then the Center’s optimal corruption tolerance $b^* > \sqrt{2c(L_P/\bar{\gamma} + r_L)}$, which implies that the Center will sacrifice some crisis control for economic performance.

Proof. By the proof of Proposition 3, we know that when $b \leq \sqrt{2c(L_P/\bar{\gamma} + r_L)}$, the Center’s objective function is increasing in b ; when $\hat{\gamma} < \bar{\gamma}$, i.e., $b > \sqrt{2c(L_P/\bar{\gamma} + r_L)}$, the objective function will be strictly increasing if

$$\hat{\gamma} \cdot \frac{f(\hat{\gamma})}{F(\hat{\gamma})} < \frac{1}{2} \cdot \frac{(1 - \alpha)b - 2cr_L(1 - \alpha)/b}{(1 - \alpha)b + c(\alpha - D)}. \tag{A.2}$$

Note that, when $D < \alpha$ and $b > \sqrt{2c(L_P/\bar{\gamma} + r_L)}$,

$$\begin{aligned} & \frac{1}{2} \cdot \frac{(1 - \alpha)b - 2cr_L(1 - \alpha)/b}{(1 - \alpha)b + c(\alpha - D)} \\ & > \frac{1}{2} \cdot \frac{(1 - \alpha)\sqrt{2c(L_P/\bar{\gamma} + r_L)} - 2cr_L(1 - \alpha) / \sqrt{2c(L_P/\bar{\gamma} + r_L)}}{(1 - \alpha)\sqrt{2c(L_P/\bar{\gamma} + r_L)} + c(\alpha - D)} \\ & = \frac{1}{2} \cdot \frac{\sqrt{L_P/\bar{\gamma} + r_L} - r_L / \sqrt{L_P/\bar{\gamma} + r_L}}{\sqrt{L_P/\bar{\gamma} + r_L} + \sqrt{c(\alpha - D)} / \sqrt{2(1 - \alpha)}} \equiv \underline{\epsilon}, \end{aligned} \tag{A.3}$$

where $\underline{\epsilon} < 1/2$. Therefore, given the objective function is continuous, we can conclude that if $\gamma \cdot f(\gamma) / F(\gamma) \leq \underline{\epsilon}$ for any $\gamma \in (\underline{\gamma}, \bar{\gamma})$, then the Center’s objective function is strictly increasing over $b < \sqrt{2c(L_P/\underline{\gamma} + r_L)}$, where $\sqrt{2c(L_P/\underline{\gamma} + r_L)} > \sqrt{2c(L_P/\bar{\gamma} + r_L)}$. The result then follows. \square

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¹⁸ Li et al. (2022) develop this result in a more general model.

¹⁹ We thank the editor and a referee for these suggestions.

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