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Coups, revolutions and efficient policies in autocracies

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ABSTRACT

The purpose of this paper is to explore the interaction of two mechanisms that might constrain the power of dictators: the threat of a coup by the selectorate and a revolution by citizens. Our results help explain a stylized fact, namely that autocracies are far more likely to be either the best or the worst performers in terms of growth and public goods policies. To this end, we focus on accountability within dictatorships using a model where both the selectorate and the citizens are the principals and the autocrat is the agent. Our results highlight that both excessively strong and excessively weak dictators lead to poor economic performances, and that a balanced distribution of de facto political power is required to incentivize the dictator to choose efficient economic policies.

1. Introduction

A striking fact is that there are many economically efficient autocracies and many very inefficient autocracies (Besley and Kudamatsu, 2008). A few examples illustrate this point. By 1975, Spain's per capita income was eight times as large as it had been in 1945; China's per capita income has increased 16 times from 1979 to the present; Malaysia, Singapore, Taiwan, and South Korea achieved growth rates of over 10% per year when under the control of dictators. However, some of the worst economic catastrophes also occurred under dictatorial regimes. Zambia witnessed its average income fall from 1964 to 1991; the economic disaster in North Korea led to millions of people suffering starvation; in Zaire, the economy collapsed after Mobutu seized power. More generally, over 20% of all observations of autocratic countries show negative growth rates, and during the tenure of a single dictator, the annual growth rates range from −11.85 to +25.03% (Rodrik, 1997; Almeida and Ferreira, 2002; Gandhi, 2008; Jones and Olken, 2005). This stylized fact calls for an explanation that we believe can be developed by analysing how political arrangements shape policy outcomes within autocracies.

In our previous work, we examined how threats of coups by the selectorate (Gilli and Li, 2013) or of revolutions by the citizens (Gilli and Li, 2014) incentivize dictators to choose policies that lead to highly heterogeneous economic performance. In this paper, we provide a more complete, detailed account of the interaction of these two threats and of the influence that they have on policy choices. Coups simply reshuffle "deck chairs" within the elite, whereas revolutions entail dramatic regime changes. Regime change is the worst possible outcome for dictators and the selectorate. In this new strategic setting, the selectorate decides to engage in a coup by considering the effects this decision will have on the probability of a revolution. Such strategic interplay between coups

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and revolutions offers a novel perspective. We find that a dictator implements efficient policies because of the strategic complementarity between the threats of coups and revolutions. The threat of coups can force the dictator to implement efficient policies because she is afraid of being overthrown (Gilli and Li, 2013). However, coups occur because the selectorate fears revolution. This role of coups as a strategic complement to revolutions is a new insight. It enriches the selectorate theory and its explanatory power. We also find that the threat of both coups and revolutions have non-monotonic effects on the dictator's incentives because they only deter a dictator from implementing inefficient policies within some range of parameters. However, when the cost of a revolution is very small, coups and revolutions become inevitable. Then, the dictator and the selectorate anticipate that no policy choice can deter a revolution. This rational expectation eliminates the dictator's incentives to implement efficient policies, and the country falls into instability; inefficient policies will prevail.

The paper proceeds as follows. In Section 2, we examine the literature related to our research, highlighting the important insights gained from it and drawing attention to the gaps our contribution aims to fill. In Section 3, we introduce and discuss our model, which is analyzed in Section 4. Section 5 concludes the paper with a brief discussion. Calculations are reported in the Appendix A.

2. Related literature

Our paper builds on the growing literature on the inner working of authoritarian political institutions. In this literature, some focus on the threat of coups by the selectorate (Bueno de Mesquita et al., 2003; Besley and Kudamatsu, 2008; Egorov and Sonin, 2011; Svolik, 2009, 2012; Gilli and Li, 2013). Others focus on the threat of revolution by the citizens (Acemoglu and Robinson, 2006; Svolik, 2013; Aidt and Jensen, 2014; Gilli and Li, 2014; Dorsch and Maarek, 2015). However, to the best of our knowledge, the strategic interaction between coups and revolution has not been the specific focus of any paper. Our starting point is that no dictator rules alone. Even the most oppressive dictators need the support of key backers. Bueno de Mesquita et al. (2003) refer to these key backers as the 'selectorate', concluding that a larger size of the selectorate is associated with a higher level of public goods provided by the government. Svolik (2009, 2012) refers to these key backers as the 'ruling coalition'. This literature, typically, assumes that all dictators share the same primary goal: to hold on to office at all costs because failing to do so will result in imprisonment, exile, or execution. Revolutionary challenges to the political systems they rule over and the loss of support among their core constituencies are the two main threats that all dictators face. This is the underlying reason why coups and revolutions are so important in shaping a wide variety of economic and political outcomes in autocratic regimes.

Based on this logic, there are two types of accountability mechanisms in autocracies (Gandhi and Przeworski, 2006). We combine them in a single model, connecting accountability in dictatorships to specific parameters. A dictatorial regime is represented by two de facto power parameters, the effective size of the selectorate (ϕ) and the cost of revolution (μ). We follow the modeling strategy of Besley and Kudamatsu (2008) and Gilli and Li (2013), modeling autocratic politics as an incomplete information game. In this framework, the dictator's incentive to build her reputation works as an incentivizing mechanism. However, a difference from the above papers is that we introduce a further player—the citizens—who are politically active but disenfranchised agents.

The introduction of the citizens into the model is important because dictators and the selectorate react to credible threats of revolution by the citizens. Since the seminal work by Acemoglu and Robinson (2006), the role of revolutionary threats has been central for explaining democratization. Using a dynamic game, Dorsch and Maarek (2015) show how political accountability can be enforced through the threat of revolution. Aidt and Jensen (2014) provide rigorous empirical evidence to show that the extension of the voting franchise in Europe was related to the threat of revolution. Evidence also reveals that the threat of revolution by citizens influences public goods provision (Li, 2014) and power sharing (Svolik, 2013) in authoritarian states. However, in many of the existing models, the probability that revolution succeeds is an increasing function of the amount of public goods provided by the autocrats (Gandhi and Przeworski, 2006; Bueno de Mesquita and Smith, 2010). Following Gilli and Li (2014), we assume that the provision of public goods by the dictator is instead a costly signal of her type, and the success technology is a linear function of the proportion of potential revolutionaries. A further difference from the model in Gilli and Li (2014) is that we leave the last move in the stage game to the citizens to model the idea that they are a player of last resort, whereas the selectorate has a watchdog role. This structure highlights the strategic complementarity between the threats of coups and revolutions.

On a more general level, our paper can also be related to the literature on political instability and growth (Jong-A-Pin, 2009; Jong-A-Pin and Yu, 2010). On the one hand, political instability is detrimental to economic growth (Alesina et al., 1996; Darby et al., 2004). Too many coups make the regime vulnerable to 'coup traps' (Londregan and Poole, 1990), whereas too many revolutions may induce too much expenditure on the military (Blomberg, 1996). On the other hand, when a dictator faces too few threats to their survival in office, she abuses her power (Linz and Chehabi, 1998; Geddes, 1999). Our paper contributes to this literature by providing a new explanation for why too little or too much political instability is harmful.

3. The model

Consider a two-period political-agency model with incomplete information played by three protagonists: the dictator, the selectorate, and the citizens. Contrary to standard political-agency models for democracies (Besley, 2006), there is no regular general election; hence, the dictators' term might be indeterminate. However, dictators can be removed from office by the selectorate through a coup or by the citizens through a revolution. Thus, dictators face two basic problems of governance: first, they need the cooperation of the selectorate and, second, they need to avoid a revolution. When dictators face credible threats by citizens or by the selectorate, they are pressed to choose efficient economic policies instead of appropriating private benefits. However, dictators differ in their ability to control the selectorate and repress the citizens. To model this institutional difference, we introduce two separate conflict technologies, one for coups, and one for revolutions. Revolutions are defined as popular revolts whose goal is a permanent change in the distribution of a country's wealth. Coups, instead, are defined as a forced resignation of the dictator without any transformation of the political regime. A coup does not change the distribution of a country's wealth but instead changes the composition of the selectorate and the identity of the dictator. Hence, the threat of a revolution is different from the threat of a coup.

We formalize these ideas as follows. In each period $t = 1, 2$, there are three players: the dictator (L) (female), the selectorate (S) (male) and the citizens (Z) (plural). In the first period, the three players play sequentially, whereas in the second period only the dictator has a possible choice, if she has not been removed by a successful revolution.

The dictator can be one of two types, either congruent or non-congruent, $T \in \{C, N\}$, with probability π of being congruent; each type has different payoffs, as explained below. The dictator is privately informed of the true state of nature $\theta_t \in \{0, 1\}$ and has to make a discrete policy choice, which is denoted by $e_t \in \{0, 1\}$. Public interest requires the dictator to match the true state of nature, i.e., to choose an efficient policy, but this would also mean that the non-congruent dictator foregoes her private benefits. The public payoff from the economic policy is Δ if $e_t = \theta_t$, and 0 if $e_t \neq \theta_t$; hence, the efficient policy produces a sort of generic public good. However, the non-congruent dictator receives a private benefit r_t from picking $e_t \neq \theta_t$, where r_t is drawn according to a continuous cumulative distribution function $G(r_t)$ with $E(r_t) = \bar{r}$, $G(\Delta) = 0$, and $G(r_t) > 0$ for $r_t > \Delta$; whereas the congruent dictator obtains no private benefit from selecting $e_t \neq \theta_t$. The interpretation of a dictator's type can be quite broad. A non-congruent type can be an incompetent dictator who finds it costly to adopt an efficient policy. Alternatively, she can be ideological, pursuing her ideological policy notwithstanding the actual situation. Whatever the interpretation, the role of the type is to provide an opportunity for the dictator to commit credibly to a specific policy through her reputation. This allows us to model the idea that economic policies might be wrong not because of ignorance or for cultural or technological reasons but because of political incentives.

To gain the loyalty of the selectorate, the dictator pays patronage to the selectorate. We suppose that the patronage is funded through the distribution of a given resource, X. From this patronage, the citizens obtain 0 and the selectorate gains $\frac{X}{\phi}$, [1] where ϕ is a measure of the effective size of the selectorate. Thus, the selectorate obtains his utility from the dictator's policy and then decides whether to support or remove her before the citizens choose whether to revolt. The idea is that the selectorate can intervene more quickly than the citizens can. If the selectorate decides on a coup, the dictator will be removed with certainty, because a dictator cannot survive without the selectorate's support. However, when the incumbent dictator is ousted from power by a coup, a new dictator will rise with the support of a new selectorate. We assume that the effective size of the new selectorate remains the same because there is no regime change.[2] The new dictator will randomly select the members of the new selectorate from the pool of the population. Thus, each member of the old selectorate has a probability ϕ of being included in the new selectorate. After the selectorate's choice, the citizens obtain their utility from the dictator's policy and the selectorate's choice, and choose whether to revolt.

The game then proceeds to the second period, in one of three possible states: no revolt, successful revolution and unsuccessful revolution. The dictator's possible actions are different in these states. We assume that a revolution would eliminate the possibility of making economic policies, because the unique choice for the dictator is to fight the revolt. Hence, a revolution is actually a conflict on the division of the given resources, X. The payoffs implied by the second-period choices are realized and the game ends.

If there is no revolution, then the dictator remains in power and her type is unchanged. She observes the nature's choice $\theta_2 \in \{0, 1\}$ and has to make a discrete policy choice denoted by $e_2 \in \{0, 1\}$. The players' second-period payoffs are then determined as in the first period following this policy choice.

If the revolution succeeds, the citizens will receive the selectorate's patronage net of the revolution's cost μ, $\frac{X-\mu}{1-\phi}$. The dictator and the selectorate will obtain a large negative payoff, $-D$, because they are ousted from power and fear for their life. Again, both these payoffs are realized at the beginning of the second period. If the revolution fails, the citizens obtain 0, and the dictator and the selectorate obtain the patronage net of the repression costs k, $\frac{X-k}{\phi}$.[3]

We assume a simple conflict technology: the revolution succeeds with probability of $1 - \phi$, i.e., the probability of success is linearly increasing with the effective size of the citizens. Hence, after a revolution, the citizens' expected payoff is $X–\mu$, whereas the dictator's and the selectorate's expected payoffs are $X - k - D + \phi D$. We assume D is sufficiently large that the dictator and the selectorate will always want to avoid taking the chance of a revolution, if possible. Moreover, to simplify calculations, we assume the dictator's and the selectorate's expected payoff is equal to 0. A negative or a small positive second-period expected payoff would make calculations more complex without adding any meaningful insight. This assumption is the simplest means of modeling the idea that both the dictator's and the selectorate's most important aim is to avoid a revolution that would challenge their political regime, whenever possible. Thus, we model the revolution in the most simple manner as a constraint on the dictator's and the selectorate's behavior, as argued by Acemoglu and Robinson (2006). Moreover, note that in these types of models, the second period simply has a role of providing forward incentives to the players' first period choices. They are not aimed at analysing the transition from autocracies to different political regimes. A further important point is that this is how the effective size of the selectorate ϕ and the cost of revolution μ capture the de facto political power of the selectorate and of the citizens in an autocratic regime.

All players' utilities are linear in their consumption, with a discount factor $\beta \in (0,1)$. Their formal expression is reported in the Appendix A. To summarize, the timing of the model is as follows:

[1] Naturally, this is just normalization.

[2] This hypothesis could be relaxed without changing our main results, as we show in Gilli and Li (2013). However, it would introduce a needless complication.

[3] Introducing k is just for symmetry; if it is costly for the citizens to initiate a revolution, it should also be costly for the dictator to repress it. However, k will not affect the normalization of the expected payoffs of the dictator and the selectorate.

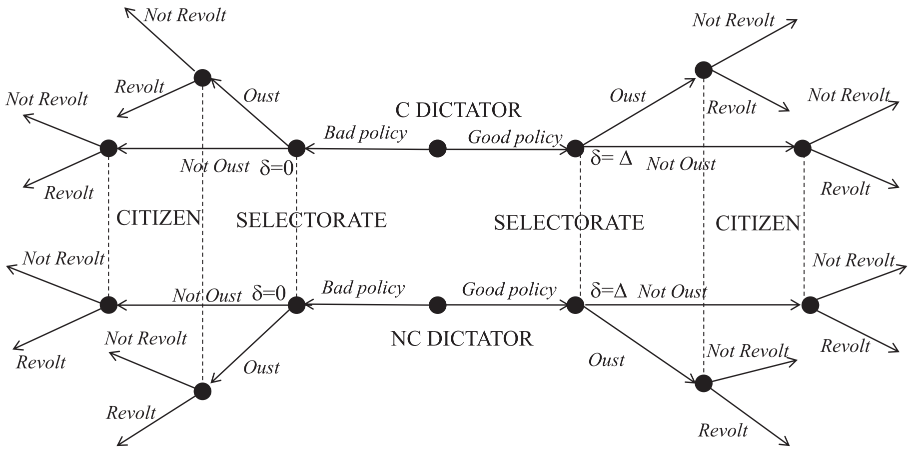

Fig. 1. The first stage game.

1. Nature determines (θ_1, r_1) and the type of dictator $T \in \{C, N\}$. These three random variables are stochastically independent and their realization is private information of the dictator.
2. Type T dictator chooses a policy, and the payoffs for each player in period one are realized. The probability of choosing an efficient policy is denoted by $\lambda_1^T : r_1 \mapsto 0,1]$.
3. The selectorate observes the effect of the policy chosen by the dictator but not her type and, based on this information, decides whether to retain the incumbent dictator. The probability of retaining the dictator is denoted by $\rho : \{0, \Delta\} \mapsto 0,1]$.
4. If the incumbent dictator is ousted from power, a new dictator will enter office and will be congruent with a probability of π. The new dictator will form her own selectorate and the members of the selectorate who deposed the previous dictator will have a probability ϕ of being included in the new one.
5. The citizens observe the choice implemented by the selectorate $\hat{\rho} \in \{0,,,1\}$ and the effect of the policy chosen by the dictator but not her type. Based on this information, they decide whether to initiate a revolution. The probability of a revolution is denoted by $\alpha : \{0, \Delta\} \times \{0,1\} \mapsto 0,1]$. The revolution succeeds with probability $1 - \phi$ and fails with probability ϕ.
6. The game enters the second period and nature determines (θ_2, r_2). In the second period, there are three possible states:

   (a) No revolution: the dictator remains in power and her type is unchanged. She observes nature's choice and chooses a policy according to her type. The payoffs are realized and the game ends.
   (b) Successful revolution: the dictator and the selectorate are removed from power and obtain a large negative payoff $-D$, whereas the citizens divide the country's wealth X, receiving a payoff $\frac{X-\mu}{1-\phi}$ net of the revolution's costs μ. These payoffs are realized and the game ends.
   (c) Failed revolution: the dictator and the selectorate divide the country's wealth X, receiving a payoff $\frac{X-k}{\phi}$ net of the repression costs k, whereas the citizens obtain a 0 payoff. These payoffs are realized and the game ends.

The first-stage game structure is reported in Fig. 1 and the notation used is summarized in Table 1.

4. Equilibria of the model

The details of the derivation in the Sequential Equilibria of the model are provided in the Appendix A. In this section, we explain the logic of the players' strategic behavior. The citizens are the "last resort" players, in the sense that they will revolt if no other incentives for the dictator work. As in standard models of revolution in autocracies, the reason for a revolt is to redistribute the country's wealth (Tullock, 1971, 1974). They will revolt if and only if the expected net gains from such a redistribution exceed their *status quo* wellbeing. The cost of revolution μ is the crucial determinant of this citizens' choice. The cost of revolution might be so large that the citizens will never revolt, so low that they will revolt notwithstanding the dictator's policy choice, or intermediate, meaning that they will revolt if and only if the policy outcome is inefficient. When the cost of revolution is intermediate, a revolution can be avoided either by removing the dictator through a coup or by an efficient policy choice taken by the dictator. The selectorate then chooses whether to oust the dictator because he fears a revolution or because of the dictator's inefficient policies. The credibility of revolution depends on μ, and the return from being part of the selectorate depends on ϕ. Hence, μ and ϕ are crucial determinants of the selectorate's choice. Finally, the non-congruent dictator wants to avoid both revolutions and coups whenever possible. To achieve this aim, she would choose an efficient policy unless the private rent available to grab is too large or a revolution is inevitable. The dictator's choice of grabbing the rent through an inefficient policy can be considered empirically equivalent to a predatory autocracy. The congruent dictator is only a commitment type; thus, there is always a positive probability of efficient policies, π, i.e., when the dictator is congruent.

In the Appendix A, we show how this strategic behavior leads to four possible equilibria depending on the players' de facto power. We interpret these equilibria as different autocratic regimes according to the dictator's incentives for choosing an efficient policy. To

Table 1
Definition of symbols.

Symbol	Definitions
	Players
L	Incumbent dictator
S	Selectorate
Z	Citizens
$T \in \{C,N\}$	Type of incumbent dictator with $Pr\{T = C\} = \pi$
	Exogenous variables
$\theta \in \{0,1\}$	State of nature
$\delta \in \{0,\Delta\}$	Payoff from the public economic policy
$r \sim G(r)$	Private random rent the dictator can extract with cdf $G(r)$
β	Discount factor
X	Exogenous wealth of the country
μ	Cost of revolution
k	The repression cost
$\phi/(1-\phi) \in [0,1]$	Effective size of the selectorate/citizens
	Endogenous variables
$\lambda^T(r)$	Probability that the type T dictator implements an efficient policy
$\rho(\delta)$	Probability that the selectorate retains the dictator after observing δ
$\alpha(\delta,\rho)$	Probability that the citizens revolt after observing δ,ρ
	Payoffs
$U^{N/Z/S}(\lambda,\alpha,\rho)$	First-period utility of the noncongruent dictator/selectorate/citizens
$V^{N/S/Z}$	Expected continuation payoff of the noncongruent dictator/selectorate/citizens

understand the empirical observable effects of such political regimes, it is important to consider the choices facing the non-congruent dictator.

The following are the possible autocratic regimes:

1. A failed state, in which the cost of revolution is so low that the citizens will revolt notwithstanding the dictator's and the selectorate's choices. Hence, the dictator will simply set the policy according to her type, and the selectorate can choose any possible behavior, without having any possibility of avoiding the revolution. Note that attempted revolutions are not inevitably successful. Hence, the observable effects of such an autocratic regime are equilibrium instability caused by revolution and possibly coups, and inefficient predatory policies are pursued with the maximum possible probability, i.e., $1 - \pi$.
2. A partially efficient autocracy, in which the cost of revolution is small so that the citizens will definitely revolt if the dictator behaves inefficiently. However, they might revolt even when the policy is efficient because they want to redistribute the national wealth. Hence, the dictator's incentives for choosing efficient policies are not maximized.
3. An efficient autocracy, in which the cost of revolution is intermediate. Under this regime, the citizens will revolt if and only if the dictator implements an inefficient policy and there is no coup. Because of this credible threat, the selectorate would launch a coup to avoid revolution if the dictator implements an inefficient policy. Hence, the dictator will implement the efficient policy unless the temptation of grabbing the private rent is too high, i.e., the dictator's incentives for choosing efficient policies are maximized.

Table 2
The possible economic regimes in equilibrium.

	$\phi \leq \frac{X}{X+\pi\Delta}$	$\phi \geq \frac{X}{X+\pi\Delta}$
$\mu \in 0,X-\Delta]$	*Failed state* Efficient policy with probability π Inefficient policy with probability $1-\pi$	*Failed state* Efficient policy with probability π Inefficient policy with probability $1-\pi$
$\mu \in X-\Delta, X-\pi\Delta]$	*Partially efficient autocracy* Efficient policy with probability $\pi + (1-\pi)G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi},\overline{\alpha}\right)$*Notethat* Inefficient policy with probability $(1-\pi)\left[1-G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi},\overline{\alpha}\right)\right]$	*Partially efficient autocracy* Efficient policy with probability $\pi + (1-\pi)G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi},\overline{\alpha}\right)$ Inefficient policy with probability $(1-\pi)\left[1-G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi},\overline{\alpha}\right)\right]$
$\mu \in X-\pi\Delta, X]$	*Efficient autocracy* Efficient policy with probability $\pi + (1-\pi)G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi}\right)$ Inefficient policy with probability $(1-\pi)\left[1-G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi}\right)\right]$	*Efficient autocracy* Efficient policy with probability $\pi + (1-\pi)G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi}\right)$ Inefficient policy with probability $(1-\pi)\left[1-G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi}\right)\right]$
$\mu \in X,+\infty)$	*Predatory autocracy* Efficient policy with probability π Inefficient policy with probability $1-\pi$	*Efficient autocracy* Efficient policy with probability $\pi + (1-\pi)G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi}\right)$ Inefficient policy with probability $(1-\pi)\left[1-G\left(\Delta,\beta,\bar{r},\frac{X}{\varphi}\right)\right]$

4. A predatory autocracy, in which the cost of revolution is so high and the effective size of the selectorate is so small that there is no credible threat of either a revolution or a coup. Hence, the non-congruent dictator will grab any possible rent and choose to purse inefficient policies because she will not be removed.

Table 2 sums up our results. It delineates the political regimes and the economic policies that emerge in equilibrium as a function of the combination of the two key political institutional parameters: the de facto power of the selectorate ϕ and the de facto power of the citizens μ.

Note that the probability of an efficient policy is smaller in a Partially Efficient Autocracy than in an Efficient Autocracy. These results answer our motivating question: when and why do different economic policies emerge in autocracies? The details of autocratic institutions shape how political power is distributed, which, in turn, determines the incentives and constraints for economic policymaking and hence for economic growth. Political power refers to the ability of different groups to act collectively to pursue their objectives or to stop other people from pursuing theirs. It comes from two sources: first, the de jure power that is allocated by formal political institutions, which in autocracies is allocated to the dictator and partially to the selectorate; second, the de facto political power that accrues to individuals or groups when they can create coups or revolutions. We distil the variety of autocratic institutional arrangements into the two critical dimensions of ϕ and μ, a reduced-form measure of the de facto power of the two principals, the selectorate and citizens. By mapping real-world autocracies onto these two dimensions, we sacrifice details and precision, but we gain the possibility of explaining a rich variety of political and economic phenomena with a simple theoretical structure.

The following subsections present in plain language the combination of ϕ and μ that give rise to the different political regimes, with their observable characteristics. The detailed derivation and the formal statement are in the Appendix A.

4.1. Failed states

Proposition 1. When the citizens' de facto power is high, i.e. $\mu \in [0,X - \Delta]$, then for any selectorate de facto power, i.e. $\forall\, \phi \in [0,1]$, the non-congruent dictator will choose an inefficient policy. For any policy implemented by the dictator, the political regime will be challenged by a citizens' revolution.

This is the case of a Failed State (FS) because, in equilibrium, there is revolution with certainty. It characterizes countries in which the dictator is insufficiently powerful to withstand challenges from the citizens, a situation of political instability. This distribution of power leads to chaos, revolts, and possibly coups. The non-congruent dictator has no incentive to choose efficient policies; why should she renounce her rent by choosing an efficient policy when she will be faced with a revolution anyway? Hence, the non-congruent dictator always chooses the inefficient policy, maximizing her rent before being challenged by a coup or a revolution. In this case, the credibility of the citizens' revolution threat is counterproductive in the sense that it generates instability and inefficient policies.

To evaluate the empirical relevance of this situation, it is important to stress that a revolution has an uncertain outcome; hence, many long-standing dictatorships that continuously face military or popular revolts belong to this class. For example, countries such as the Democratic Republic of Congo from 1998, contemporary Mali, Sierra Leone from 1991 to 2001, Somalia after the collapse of Siad Barre's government, Yemen from 1990, Haiti from 1990, and Afghanistan after the withdrawal of the Soviet Union are contexts in which dictators and selectorate face endemic revolts and should be considered as Failed States. Although some of them maintain the same dictator for many years, violent conflicts constitute the ultimate manifestation of state failure because a monopoly on force is the minimal function of a government.[4]

4.2. Partially efficient autocracies

Proposition 2. When the citizens' de facto power is large, i.e. $\mu \in [X - \Delta, X - \pi\Delta]$, then for any selectorate de facto power, i.e. $\forall\, \phi \in [0,1]$, if the private rent is large enough, the non-congruent dictator will choose an inefficient policy to grab it; otherwise, she adopts an efficient policy. If an inefficient policy is implemented, she faces a citizens' revolt; if the implemented policy is efficient, with a strictly positive probability, the citizens will revolt anyway because of the unequal income distribution and the selectorate will not remove the dictator.

This is the case of a Partially Efficient Autocracy (PEA). The dictator only has partial incentives for behaving correctly because there is a strictly positive probability that she will be challenged by a revolt anyway. In practice, this case is extremely similar to the Efficient Autocracy discussed in the following proposition. The only difference is that the incentives for choosing efficient policies are not maximized because the citizens might revolt even when the policies are efficient. Hence, the probability of having efficient policies is smaller than in efficient autocracies. Moreover, there is more political instability than in the case of Efficient Autocracies because, in equilibrium, there is a strictly positive probability of revolution.

[4] See, for example, the Failed States Index of The Fund for Peace and Foreign Policy, 2012 and the Index of State Weakness of Brookings Instititution, 2008.

4.3. Efficient autocracies

Proposition 3. *Suppose that either*

1. the citizens' de facto power is intermediate, i.e. $\mu \in [X - \pi\Delta, X]$, while the selectorate's de facto power can take any value, i.e. $\forall\ \phi \in [0,1]$, or
2. the citizens' de facto power is very low, i.e. $\mu \in [X, +\infty)$, but the selectorate's de facto power is high, i.e. $\phi \geq \frac{X}{X+\pi\Delta}$.

If the private rent is large enough, the non-congruent dictator will choose an inefficient policy to grab it, otherwise she will prefer an efficient policy. If an inefficient policy is implemented, then she is overthrown by a coup of the selectorate.

This is the case of an Efficient Autocracy (EA) because the dictator has the maximum possible incentive to choose efficient policies. In equilibrium, we never observe revolutions, but might observe coups. The political outcome for the two different combinations of ϕ and μ that sustain an efficient autocracy is the same, but the political forces at work are completely different.

In the first case, $\mu \in [X - \pi\Delta, X]$ and $\phi \in [0,1]$, an efficient policy is implemented because of the credible threat of a revolution, which, in turn, induces a credible threat of a coup independently of the selectorate's political power. Indeed, the citizens will revolt if the dictator implements an inefficient policy. However, anticipating this behavior, the selectorate prefers to remove a dictator who does not choose an efficient policy to avoid a revolution. In this case, the role of the coup threat is a strategic complement to the credible threat of revolution. When the selectorate power is low, the threat of a revolution is crucial to incentivize the selectorate to behave as an effective watchman. However, in equilibrium, the revolution will not actually occur because the selectorate will remove the dictator after an inefficient policy. The selectorate's pre-emptive action is the only means of avoiding a revolution that would hurt both the selectorate and the dictator. This is a very important qualification of the results of the selectorate theory of Bueno de Mesquita et al. (2003) and Besley and Kudamatsu (2008), in which the emphasis is on the power of the selectorate only. In our model, the introduction of the citizens induces an incentivizing role of the selectorate irrespective of how powerful they are. Many autocracies can be characterized by this regime including, for example, China after the Tiananmen protests (Gilli and Li, 2014).

In the second case, $\mu \in [X, +\infty)$ and $\phi \in \left[\frac{X}{X+\pi\Delta}, 1\right]$, the citizens will not revolt, but the selectorate is sufficiently powerful to credibly threaten a coup after an inefficient policy choice. The crucial incentivizing role is played by the selectorate, and the credible threat of a coup is a strategic substitute for the ineffective threat of revolution. Again, many autocracies can be characterized by this regime, for example, China after Mao's death and before the Tiananmen protests (Gilli and Li, 2013).

The equilibrium outcomes from these two cases are the same; efficient and inefficient policies are possible with the same probabilities in both cases. However, the strategic behaviors that induce the same dictator's choice are different. In both situations, when the private rent of the dictator is huge, future revenues from holding power will be less valuable than their appropriation in the present. The non-congruent dictator thus will choose the inefficient economic policy and will be removed by a coup. However, the reasons for a coup are different; in the first case, the selectorate motivation is fear of a citizens' revolution, whereas in the second case, the selectorate motivation is the possibility of recruiting a new congruent dictator without losing the privilege of being in the selectorate.

4.4. Predatory autocracies

Proposition 4. When the citizens' and selectorate's de facto power is very low, i.e. $\mu \in [X, +\infty)$ and $\phi \leq \frac{X}{X+\pi\Delta}$, the non-congruent dictator will choose an inefficient policy to grab the rent no matter how small it is. Notwithstanding this inefficient choice, she will remain in power because neither the selectorate nor the citizens have the incentives to remove her.

This is the case of a Predatory Autocracy (PA). When the cost of revolution is extremely high, the threat of a coup is the only constraint on the dictator. However, when the selectorate power is small, the threat of a coup is not credible. In such a case, the dictator will implement the inefficient policy and nonetheless remain in power. This case coincides with the kleptocratic equilibrium analyzed in Gilli and Li (2013). North Korea, Zaire and Haiti before 1990 are examples of Predatory Autocracies (Acemoglu et al., 2004). Another interesting example of a shift from a partially efficient autocracy to a predatory autocracy is Uzbekistan before and after 1990. When Uzbekistan was part of the Soviet Union, the Uzbekistan dictator Karimov was restrained by the Soviet selectorate and its credible threat of removal by the Central Committee of the Communist Party. Once Uzbekistan gained its independence, there was no more constraint by the selectorate and the country developed into a predatory autocracy.

4.5. Comments on the model

The starting point of the model is that accountability works in a very different manner in democracies and in autocracies. In democracies, the incentives on the leaders' behavior are related to the possibility of a peaceful removal through a regular election. In dictatorships, these incentives are dramatically different and rely on the credible use of force, i.e., either a coup or a revolution. Coups are actually more similar to a defeat in general elections because there is no change in the political regime, only in the dictator and in the selectorate. This point is made forcefully by Besley and Kudamatsu (2008). Our model introduces a new accountability

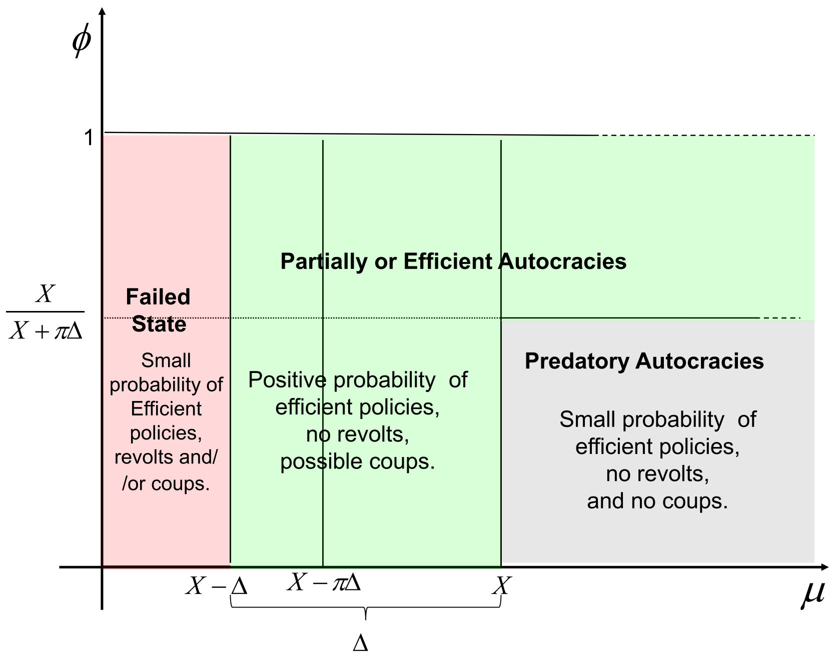

Fig. 2. The relation of policy outcomes with ϕ and μ.

mechanism, the credible threat of revolution. Revolutions, however, work as an incentive device only if the dictator or the selectorate might avoid revolutions by choosing efficient policies.

The model reflects this general view and builds on many simplifications.

First, the players are homogeneous in the sense that all members in the same group (dictator/selectorate/citizens) share the same preferences. As is common practice, we refer to a group of people having a common identifying interest and being capable of making joint decisions as a single player. This assumption avoids two topics that, although relevant, would obscure the focus of our analysis of accountability: the collective action problem and the mechanism for aggregating different preferences. The collective action problem is particularly important for citizens in dictatorships. However, our model relies on the role of revolution's threats, which are a real problem for any authoritarian polity even when their credibility differs for different authoritarian polities. Note that the cost of revolting μ, among other things, is partially catching the cost of citizens' collective action because an increase in μ increases the difficulty of credibly threatening to revolt.

Second, we assume the dictator cannot use redistributive policies or repression to avoid citizens' revolutions. The reasons for this assumption are that we believe that redistributive policies are not credible if they are not associated with a change in the political regime from autocracy to democracy (Acemoglu and Robinson, 2006) and that we focus on the incentives for implementing efficient policies, whereas the full analysis of redistributive policies or repression would dilute our analysis.

Finally, the interpretation of our results relies on the distinction between de jure and de facto political power; de jure power is the formal power allocation as determined by political institutions, whereas de facto political power accrues to the agents who can create coups, riots or revolts. The effective size of the selectorate ϕ and the cost of revolting μ capture the de facto political power of the selectorate and of the citizens in an autocratic polity. In the selectorate theory, as developed by Bueno de Mesquita et al. (2003), ϕ is simply the relative proportion of the selectorate (the winning coalition) in the whole population. However, a country's population is usually huge compared with the size of its selectorate. Because any number divided by such a huge denominator is tiny, it may be tempting to avoid any distinction among autocracies because all are close to a one-man dictatorship. However, it should be stressed that what really matters is the balance of the de facto power among different players, in which power and size are correlated. We assume the benefit of an increase in the effective size of the selectorate, ϕ, is accompanied by the cost of a diluted payoff $\frac{X}{\phi}$. For these reasons, we call ϕ the "effective" size of the selectorate, a summary statistic for a wide variety of institutional characteristics that limit the power of the autocrat. Similarly, a crucial role in the model is played by the "cost of revolution" for the citizens, μ, which directly affects the credibility of the revolutionary threat. We treat μ as a summary statistic for a wide variety of institutional characteristics that limit the de facto power of the citizens, i.e., their possibility of credibly threatening the removal of the dictator. Of course, in a more complex model, ϕ and μ should be endogenized both because they are path dependent and because the dictator and the selectorate have incentives to manipulate these parameters to avoid being accountable. This point, however, would deserve a new paper.

These assumptions are convenient but gross simplifications. Because of them, the game is quite simple; there are three players and two possible types of dictator, each endowed with two possible actions, linear payoffs, and trivial conflict technology. However, because of its simplicity, the model is very effective. For each combination of political institutional parameters, there is a unique fully characterized Sequential Equilibrium outcome. Hence, we are able to make meaningful comparative statics exercises, highlighting the reasons for the heterogeneity in the economic performance of autocracies.

4.6. Comparative statics

Fig. 2 shows in (ϕ, μ) space the four different regimes discussed above and is useful to explain how the variations in key parameters of the model affect the boundaries between the regimes.

This graph shows that the role of the country's wealth X is complex. An increase in the country's wealth shifts the regime's borders towards the right. This increases the likelihood of producing a Failed State, decreases the range of μ and increases the range of ϕ in which Predatory Autocracies is the equilibrium outcome. The net result of this opposite effect is uncertain. Moreover, within Efficient Autocracies, the effect also increases the probability of observing an efficient policy. Hence, the general effect of X on the observed events is ambiguous. This complex role of national wealth might explain the contradictory empirical results on the natural-resource curse (Ulfelder, 2007, and Van der Ploeg, 2011).

Another interesting aspect of our results is that they suggest a sort of modernization theory (Lipset, 1959); an increment in the public payoff Δ generated by efficient policies increases the likelihood of an Efficient Autocracy, suggesting the possibility of virtuous (vicious) circles of good (bad) policies.

Within the region of Efficient Autocracies, the probability of actually implementing an efficient policy decreases with the de facto power of the selectorate. There are two reasons for this effect. First, the dictator must share the benefits of ruling the regime with the selectorate, and if the selectorate has more power, the dictator must share more benefits with the selectorate to avoid a coup. Therefore, a too powerful selectorate reduces the benefits the dictator can gain from holding office and thus reduces the dictator's incentive to implement efficient policies to remain in power. Second, if the selectorate is more powerful, the probability that the selectorate can successfully overthrow the dictator through a coup increases. Thus, other things being equal, the selectorate will be more inclined to launch a coup. This effect also reduces the dictator's incentive to hold on to office. This finding further differentiates our paper from Besley and Kudamatsu (2008), in which the probability of an efficient policy monotonically increases with the size of the selectorate. This finding might be applied to countries such as Thailand, whose economy has been trapped in the serial drama of selectorate coups and leadership changes.

5. Conclusion

What are dictatorships? We start from the idea that they are political systems in which the dictator is appointed to or removed from power not by regular contested elections but by force, either by a coup or by a revolution. Within this general framework, how autocracies organize their institutions is reflected in the distribution of the de facto political power among political players, and this distribution, in turn, is mirrored in their economic performances. Understanding the subtle ways of incentivizing dictators to undertake efficient economic policies is central to explaining the existence of both economic prosperity and economic misery in autocratic systems. In fact, after being treated as a residual category for a long time, autocracies are increasingly being recognized as encompassing different political institutions that have crucial consequences for economic policies, outcomes and, ultimately, for the stability of authoritarianism itself, although there is no clear agreement on the dimensions along which dictatorships should be distinguished. In this paper, we have argued that the ways in which leaders are removed from power not only determine the distinction between democracies and dictatorships but also dictators' economic policies. Hence, this paper offers an explanation of why, although human history is a story of self-interested dictators, under some there has been a surprising amount of economic progress.

We generalize and complement the results of Bueno De Mesquita et al. (2003) and Besley and Kudamatsu (2008). In doing so, we provide a further step towards a systematic explanation of the differences between successful and unsuccessful autocracies in terms of the forces that shape accountability in the absence of regularized elections. We focus on the primary objective of any dictator, survival, showing how both the selectorate's and the citizens' de facto power shape the dictator's behavior in contending with the risks represented by coups and revolts. Our results highlight that efficiency considerations cannot be separated from de facto political power; not only in democracies but also in autocracies, how political power is institutionalized is important for checking which policies are incentive-compatible and which threats are credible. In particular, the role of checks and balances in disciplining autocrats is subtle; efficient policies in autocracies require either an intermediate strength of the citizens, so that the threat of revolution by the citizens is credible only when there are poor outcomes, or a sufficiently strong selectorate, so that a coup threat is credible. Otherwise, we will have inefficient failed or predatory states. We also stress that the crucial incentivizing role is played by the citizens, whereas the selectorate plays the role of a "watchman" who will remove the dictator after an inefficient policy because its members are strategically motivated by the possibility of a citizens' revolution, a view that provides an interesting qualification of the classic results of the selectorate theory.

The model presented in this paper is preliminary in many important respects. The model presents a reduced-form framework of the interaction between economic and political forces. To gain a deeper understanding of this interaction, a disaggregation is necessary, allowing political reform to be an equilibrium outcome. This leads us to consider a further important generalization for future work, namely the endogenization of the two key parameters ϕ and μ. For example, a problem that is overlooked in this model and that should be the object of further research is the regime's reaction to the threat of a revolution; the dictator may react by increasing levels of repression or by allowing partial political rights, making the costs of revolution endogenous.

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Appendix A. The proof of proposition 1

First period payoffs are:

$$U^N = \begin{cases} \Delta + \dfrac{X}{\phi} & \text{if } e_1 = \theta \\ r_1 + \dfrac{X}{\phi} & \text{if } e_1 \neq \theta_1 \end{cases} \qquad U^S \begin{cases} \Delta + \dfrac{X}{\phi} & \text{if } e_t = \theta_t \\ \dfrac{X}{\phi} & \text{if } e_1 = \theta_1 \end{cases}$$

$$U^C = U^Z = \begin{cases} \Delta & \text{if } e_1 = \theta_1 \\ 0 & \text{if } e_1 = \theta_1 \end{cases}$$

while in the second period they get[5]

$$U^N = \begin{cases} \Delta + \dfrac{X}{\phi} & \text{if } e_2 = \theta_2 \text{ and no revolt nor coup} \\ r_2 + \dfrac{X}{\phi} & \text{if } e_2 \neq \theta_2 \text{ and no revolt nor coup} \\ 0 & \text{if revolt or coup} \end{cases}$$

$$U^C = \begin{cases} \Delta & \text{if } e_2 = \theta_2 \text{ and no revolt nor coup} \\ 0 & \text{otherwise} \end{cases}$$

$$U^Z = \begin{cases} \Delta & \text{if } e_2 = \theta_2 \text{ and no revolt} \\ 0 & \text{if } e_2 \neq \theta_2 \text{ and no revolt} \\ \begin{array}{ll} \dfrac{X-\mu}{1-\phi} & \text{with probability } 1-\phi \\ 0 & \text{with probability } \phi \end{array} & \text{if revolt} \end{cases}$$

$$U^S = \begin{cases} \Delta + \dfrac{X}{\phi} & \text{if } e_2 = \theta_2 \text{ and no revolt nor coup} \\ \dfrac{X}{\phi} & \text{if } e_2 \neq \theta_2 \text{ and no revolt nor coup} \\ 0 & \text{if revolt} \\ \begin{array}{ll} \Delta + \dfrac{X}{\phi} & \text{with probability } \phi \\ 0 & \text{with probability } \phi \end{array} & \text{if } e_2 = \theta_2, \text{ no revolt but coup} \\ \begin{array}{ll} \dfrac{X}{\phi} & \text{with probability } \phi \\ 0 & \text{with probability } \phi \end{array} & \text{if } e_2 \neq \theta_2, \text{ no revolt but coup.} \end{cases}$$

We use Sequential Equilibrium (SE) as solution concept instead of the more common Perfect Bayesian Equilibrium, since we have to analyze a three-player game and SE encompass the notion of consistency which implies that players' beliefs agree out of the equilibrium path.

A.1. Players' sequential rational choices

The second period choices are the myopic best replies. Hence, we will analyze the players' behavior in the first-stage game, assuming that the players will play their best responses in the second final period.

A.1.1. Sequential rationality of the citizens

After knowing their first-period utility and the selectorate's choice at the end of the first period, the citizens choose between revolt ($\alpha = 1$) or not ($\alpha = 0$). Thus, we consider four possible information sets: $(\delta = \Delta, \rho = 1)$, $(\delta = \Delta, \rho = 0)$, $(\delta = 0, \rho = 1)$, $(\delta = 0, \rho = 0)$,

[5] The expected payoffs of the dictator and the selectorate when there is a revolt are normalized to 0.

where in each information set, there are two decision nodes depending on the type of dictator. Let $V^Z(\alpha|\delta,\rho)$ be the expected continuation payoff for the citizens when they choose α if (δ,ρ). When $\alpha(\delta,\rho) = 1$

$$V^Z(\alpha = 1|\delta,\rho) = (1-\phi) \times \frac{X-\mu}{1-\phi} + \phi \times 0 = X-\mu. \tag{A1}$$

that does not depend on their beliefs. On the other hand, when $\alpha(\delta,\rho) = 0$ the citizens beliefs derived by Bayes' rule are

$$P^Z(C|\delta = \Delta,\rho) = \frac{\pi \times \overline{\lambda}^C \times \rho(\Delta)}{\pi \times \overline{\lambda}^C \times \rho(\Delta) + (1-\pi) \times \overline{\lambda}^N \times \rho(\Delta)}. \tag{A2}$$

$$P^Z(C|\delta = 0,\rho) = \frac{\pi \times \left(1-\overline{\lambda}^C\right) \times \rho(0)}{\pi \times \left(1-\overline{\lambda}^C\right) \times \rho(0) + (1-\pi) \times \left(1-\overline{\lambda}^N\right) \times \rho(0)}, \tag{A3}$$

where

$$\overline{\lambda}^T = \int_{-\infty}^{\infty} \lambda^T(r_1)dG(r_1), \text{ with } T \in \{C, NC\}.$$

Note that, by consistency, $\rho(\delta) > 0$; hence, we can simplify the previous ratios getting

$$P^Z(C|\delta = \Delta,\rho) = \frac{\pi \times \overline{\lambda}^C}{\pi \times \overline{\lambda}^C + (1-\pi) \times \overline{\lambda}^N} = P^S(C|\delta = \Delta) \tag{A4}$$

$$P^Z(C|\delta = 0,\rho) = \frac{\pi \times \left(1-\overline{\lambda}^C\right)}{\pi \times \left(1-\overline{\lambda}^C\right) + (1-\pi) \times \left(1-\overline{\lambda}^N\right)} = P^S(C|\delta = 0), \tag{A5}$$

while if $\rho(\delta) = 0$, there is a new dictator and thus, for any $\delta \in \{0,\Delta\}$

$$P^Z(C|\delta, 0) = \pi. \tag{A6}$$

Finally, since by construction $\lambda^C(r_1) = 1$ for any r_1 and thus $\overline{\lambda}^C = 1$, then

$$P^S(C|\delta = \Delta) = P^Z(C|\delta = \Delta,\rho) =: \Pi\left(\overline{\lambda}^N\right) = \frac{\pi}{\left[\pi + (1-\pi) \times \overline{\lambda}^N\right]} \in [\pi, 1]. \tag{A7}$$

Moreover

$$P^Z(C|\delta = 0,\rho) = P^S(C|\delta = 0) = \frac{0}{(1-\pi) \times \left(1-\overline{\lambda}^N\right)} \tag{A8}$$

which implies

$$\forall \overline{\lambda}^N \in [0, 1) \quad P^Z(C|\delta = 0,\rho) = P^S(C|\delta = 0) = 0. \tag{A9}$$

Hence, the only problematic case is when $\overline{\lambda}^N = 1$, which would imply $P^Z(C|\delta = 0,\rho) = P^S(C|\delta = 0) \in [0,1]$. However, in this case, we can use a classic forward induction argument [6] to assume that $P^Z(C|\delta = 0,\rho) = P^S(C|\delta = 0) = 0$ since the congruent type has no reason to deviate to a inefficient policy. Hence, we might conclude that

$$\forall \overline{\lambda}^N \in [0,1] \quad P^Z(C|\delta = 0,\rho) = P^S(C|\delta = 0) = 0. \tag{A10}$$

[6] For example, we can apply the intuitive criterion of Cho and Kreps (1987).

1. Information set $(\delta = \Delta, \hat{\rho} = 1)$. Since

$$V^Z(\alpha = 0|\delta = \Delta, \rho = 1) = P^Z(C|\delta = \Delta, \rho = 1) \times \Delta + \left(1 - P^Z(C|\delta = \Delta, \rho = 1)\right) \times 0 = \Pi\left(\overline{\lambda}^N\right)\Delta,$$
$$V^Z(\alpha = 1|\delta = \Delta, \rho = 1) \geq V^Z(\alpha = 0|\delta = \Delta, \rho = 1) \Leftrightarrow \tag{A11}$$

$$\Leftrightarrow \alpha(\delta = \Delta, \rho = 1) = 1 \Leftrightarrow X - \mu \geq \Pi\left(\overline{\lambda}^N\right)\Delta \Leftrightarrow \mu \leq X - \Pi\left(\overline{\lambda}^N\right)\Delta \Leftrightarrow \overline{\lambda}^N \geq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu} - 1\right). \tag{A12}$$

2. Information set $(\delta = \Delta, \hat{\rho} = 0)$. Since

$$V^Z(\alpha = 0|\delta = \Delta, \hat{\rho} = 0) = \pi\Delta + (1-\pi)0 = \pi\Delta, \tag{A13}$$

$$V^Z(\alpha = 1|\delta = \Delta, \hat{\rho} = 0) \geq V^Z(\alpha = 0|\delta = \Delta, \hat{\rho} = 0) \Leftrightarrow \tag{A14}$$

$$\Leftrightarrow \alpha(\delta = \Delta, \hat{\rho} = 0) = 1 \Leftrightarrow X - \mu \geq \pi\Delta \Leftrightarrow \mu \leq X - \pi\Delta. \tag{A15}$$

3. Information set $(\delta = 0, \hat{\rho} = 1)$. Since

$$V^Z(\alpha = 0|\delta = 0, \hat{\rho} = 1) = P(C|\delta = 0, \hat{\rho} = 1)\Delta + (1 - P(C|\delta = 0, \hat{\rho} = 1))0 = 0.$$

$$V^Z(\alpha = 1|\delta = 0, \hat{\rho} = 1) \geq V^Z(\alpha = 0|\delta = 0, \hat{\rho} = 1) \Leftrightarrow \tag{A16}$$

$$\Leftrightarrow \alpha(\delta = 0, \hat{\rho} = 1) = 1 \Leftrightarrow X - \mu \geq 0 \times \Delta \Leftrightarrow \mu \leq X. \tag{A17}$$

4. Information set $(\delta = 0, \hat{\rho} = 0)$. Since

$$V^Z(\alpha = 0|\delta = 0, \hat{\rho} = 0) = \pi\Delta + (1-\pi) \times 0 = \pi\Delta, \tag{A18}$$

$$V^Z(\alpha = 1|\delta = 0, \hat{\rho} = 0) \geq V^Z(\alpha = 0|\delta = 0, \hat{\rho} = 0) \Leftrightarrow \tag{A19}$$

$$\Leftrightarrow \alpha(\delta = 0, \hat{\rho} = 0) = 1 \Leftrightarrow X - \mu \geq \pi\Delta \Leftrightarrow \mu \leq X - \pi\Delta. \tag{A20}$$

Thus, we have the following citizens' best reply correspondences:

$$\alpha\left(P^Z(C|\delta,\rho)|\delta = \Delta, \hat{\rho} = 1\right)^{BR} = \begin{cases} 1 & \mu \leq X - \Pi\left(\overline{\lambda}^N\right)\Delta \\ 0 & \mu \geq X - \Pi\left(\overline{\lambda}^N\right)\Delta \end{cases} = \begin{cases} 1 & \overline{\lambda}^N \geq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu} - 1\right) \\ 0 & \overline{\lambda}^N \leq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu} - 1\right) \end{cases}$$
$$\alpha\left(P^Z(C|\delta,\rho)|\delta = 0, \hat{\rho} = 1\right)^{BR} = \begin{cases} 1 & \mu \leq X \\ 0 & \mu \geq X \end{cases}$$
$$\alpha\left(P^Z(C|\delta,\rho)|\delta = \Delta, \hat{\rho} = 0\right)^{BR} = \begin{cases} 1 & \mu \leq X - \pi\Delta \\ 0 & \mu \geq X - \pi\Delta \end{cases}$$
$$\alpha\left(P^Z(C|\delta,\rho)|\delta = 0, \hat{\rho} = 0\right)^{BR} = \begin{cases} 1 & \mu \leq X - \pi\Delta \\ 0 & \mu \geq X - \pi\Delta \end{cases}$$

A.1.2. Sequential rationality of the selectorate

Let $V^S(\rho, \alpha^{BR}|\delta)$ be the expected continuation payoff for the selectorate in δ. When $\rho = 0$, for any $\delta \in \{0, \Delta\}$

$$V^S\left(\rho = 0, \alpha^{BR}|\delta\right) = \left(1 - \alpha^{BR}\right)\left[\pi \times \Delta + (1-\pi) \times 0 + \phi \times \frac{X}{\phi} + (1-\phi) \times 0\right] + \alpha^{BR} \times 0 =$$
$$= \left(1 - \alpha^{BR}\right)(\pi\Delta + X) = \begin{cases} 0 & \mu \leq X - \pi\Delta \\ \pi\Delta + X & \mu \geq X - \pi\Delta, \end{cases}$$

when $\rho = 1$, for any $\delta \in \{0,\Delta\}$

$$V^S\left(\rho=1,\alpha^{BR}|\delta\right) = \left(1-\alpha^{BR}\right)\left[P^S(C|\delta)\left(\Delta+\frac{X}{\phi}\right)+\left(1-P^S(C|\delta)\right)\frac{X}{\phi}\right]+\alpha^{BR}\times 0 =$$
$$= \left(1-\alpha^{BR}\right)\left(P^S(C|\delta)\Delta+\frac{X}{\phi}\right) = \begin{cases} 0 & \overline{\lambda}^N \geq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \ \& \ \delta=\Delta \\ \Pi\left(\overline{\lambda}^N\right)\Delta+\frac{X}{\phi} & \overline{\lambda}^N \leq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \ \& \ \delta=\Delta \\ 0 & \mu\leq X \ \& \ \delta=0 \\ \frac{X}{\phi} & \mu\geq X \ \& \ \delta=0. \end{cases}$$

Hence

$$\rho\left(\alpha^{BR}|\delta=0\right)=1 \Leftrightarrow \begin{cases} 0 & \mu\leq X \\ \frac{X}{\phi} & \mu\geq X \end{cases} \geq \begin{cases} 0 & \mu\leq X-\pi\Delta \\ X+\pi\Delta & \mu\geq X-\pi\Delta \end{cases} \Leftrightarrow \tag{A22}$$

$$\Leftrightarrow \rho\left(\delta=0|\alpha^{BR}\right)^{BR} = \begin{cases} 0,1] & \mu\leq X-\pi\Delta \\ 0 & \mu\in X-\pi\Delta, X] \\ 0 & \mu\geq X \ \& \ \phi\geq\frac{X}{X+\pi\Delta} \\ 1 & \mu\geq X \ \& \ \phi\leq\frac{X}{X+\pi\Delta}; \end{cases} \tag{A23}$$

$$\rho\left(\alpha^{BR}|\delta=\Delta\right)=1 \Leftrightarrow \begin{cases} 0 & \mu\leq X-\Pi\left(\overline{\lambda}^N\right)\Delta \\ \Pi\left(\overline{\lambda}^N\right)\Delta+\frac{X}{\phi} & \mu\geq X-\Pi\left(\overline{\lambda}^N\right)\Delta \end{cases} \geq \begin{cases} 0 & \mu\leq X-\pi\Delta \\ X+\pi\Delta & \mu\geq X-\pi\Delta \end{cases} \Leftrightarrow \tag{A24}$$

$$\Leftrightarrow \rho\left(\delta=\Delta|\alpha^{BR}\right)^{BR} = \begin{cases} [0,1] & \mu\leq X-\Pi\left(\overline{\lambda}^N\right)\Delta \\ 1 & \mu\geq X-\Pi\left(\overline{\lambda}^N\right)\Delta. \end{cases} = \begin{cases} \in[0,1] & \overline{\lambda}^N \geq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \\ 1 & \overline{\lambda}^N \leq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right). \end{cases} \tag{A25}$$

A.1.3. Sequential rationality of the dictator and the consequent players' beliefs

Suppose that $\mu \in \left[0, X-\Pi\left(\overline{\lambda}^N\right)\Delta\right]$.

Then $\alpha(\delta,\rho)^{BR} = 1 \ \forall \ (\delta,\rho) \in \{0,\Delta\} \times \{0,1\}$ and $\rho(\delta)^{BR} \in [0,1]$. The non-congruent dictator anticipates that the citizens will revolt anyway, so she would always choose to get the private rent, i.e. $\lambda^N(r_1) = 0 \ \forall \ r_1$. Therefore

$$P(C|\delta=\Delta) =: \Pi\left(\overline{\lambda}^N\right) = \frac{\pi\times 1}{\pi\times 1+(1-\pi)\times 0} = 1 \tag{A26}$$

as $\overline{\lambda}^N = \int_{-\infty}^{\infty}\lambda^N(r_1)dG(r_1) = \int_{-\infty}^{\infty}0\times dG(r_1) = 0$. Finally,

$$\mu \leq X-\Pi\left(\overline{\lambda}^N\right)\Delta \Leftrightarrow \mu \leq X-\Pi\left(\overline{\lambda}^N\right)\Delta \leq \overline{\lambda}^N = 0 \Leftrightarrow \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \leq 0 \Leftrightarrow \mu \leq X-\Delta.$$

Hence, when $\mu \leq X-\Delta$ we have a continuum of outcome equivalent SE with $\lambda^C(r_1) = 1 \ \forall \ r_1$, $\lambda^N(r_1) = 0 \ \forall \ r_1$, $\rho(\delta) \in [0,1] \ \forall \ \delta$ and $\alpha(\delta,\rho) = 1 \ \forall \ (\delta,\rho)$.

Suppose that $\mu \in [X-\Delta, X-\pi\Delta]$.

The citizens will revolt in any information set (δ,ρ) apart from the case $(\delta=\Delta,\rho=1)$, where the citizens' behavior will depend on the value $\Pi\left(\overline{\lambda}^N\right)$ which is endogenous. When $\delta=\Delta$

$$\begin{aligned} \alpha\left(\overline{\lambda}^N|\delta=\Delta,\rho=1\right)^{BR} &= \begin{cases} 1 & \overline{\lambda}^N \geq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \\ 0 & \overline{\lambda}^N \leq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \end{cases} \\ \rho\left(\overline{\lambda}^N|\delta=\Delta,\alpha^{BR}\right)^{BR} &= \begin{cases} [0,1] & \overline{\lambda}^N \geq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \\ 1 & \overline{\lambda}^N \leq \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right). \end{cases} \end{aligned} \tag{A27}$$

Suppose that in a SE $\lambda^N(r_1)=1$, then $EU^N\left(\lambda^N(r_1)=1\right)=\Delta+\frac{X}{\phi}$ while a deviation to $\lambda^N(r_1)=0$ implies $EU^N\left(\lambda^N(r_1)=0\right)=r_1+\frac{X}{\phi}$, which is greater. Hence, $\lambda^N(r_1)=1$ is not part of a SE. Suppose that in a SE $\lambda^N(r_1)=0$, then $EU^N\left(\lambda^N(r_1)=0\right)=r_1+\frac{X}{\phi}$ while a deviation to $\lambda^N(r_1)=1$ implies $EU^N\left(\lambda^N(r_1)=1\right)=\Delta+\frac{X}{\phi}+\beta\left(\overline{r}+\frac{X}{\phi}\right)$, which is smaller if $r_1\geq\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)$ Hence, if $r_1\geq\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)$, we in a SE $\lambda^N(r_1)=0$. However, when $r_1\leq\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)$, we need to look for mixed strategy behavior. Since $\mu\in[X-\Delta,X-\pi\Delta]$ implies that $\alpha(0,\rho)=\alpha(\Delta,0)=1$ are strictly dominant actions for the citizens, they only mix in $\delta=\Delta,\rho=1$. Hence, a mixed behavioral strategy for the citizens is just $\alpha(\Delta,1)\equiv\overline{\alpha}\in0,1]$. Then

$$EU^N(\lambda(r_1),\overline{\alpha}|r_1,)= \begin{cases} -\lambda^N(r_1)\left[r_1-\Delta-\beta\left(\overline{r}+\frac{X}{\phi}\right)\right]+r_1+\frac{X}{\phi} & \text{if } \overline{\lambda}^N\leq\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \\ -\lambda^N(r_1)\left[r_1-\Delta-\beta\left(\overline{r}+\frac{X}{\phi}\right)+\overline{\alpha}\beta\left(\overline{r}+\frac{X}{\phi}\right)\right]+r_1+\frac{X}{\phi} & \text{if } \overline{\lambda}^N=\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \\ -\lambda^N(r_1)[r_1-\Delta]+r_1+\frac{X}{\phi}. & \text{if } \overline{\lambda}^N\geq\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right) \end{cases}.$$

Consider the three possible situations one by one:

1. If $\overline{\lambda}^N\geq\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right)$, then the non-congruent dictator's best reply is $\lambda^N(r_1)^{BR}=0$ which is not consistent with the condition $\overline{\lambda}^N=\int_\Delta^{+\infty}\lambda^N(r_1)dG(r_1)\geq\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right)$.
2. If $\overline{\lambda}^N\leq\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right)$, then the non-congruent dictator's best reply is $\lambda^N(r_1)^{BR}=\begin{cases}0 & r_1\geq\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)\\ 1 & r_1\leq\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)\end{cases}$ which might be consistent with the condition $\overline{\lambda}^N=\int_\Delta^{+\infty}\lambda^N(r_1)dG(r_1)=G\left(\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)\right)\leq\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right)$, depending on the characteristic of the cdf G and of the structural parameters.
3. Finally, if $\overline{\lambda}^N=\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right)$, then the non-congruent dictator's best reply is $\lambda^N(r_1)^{BR}=\begin{cases}0 & r_1\geq\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)-\overline{\alpha}\beta\left(\overline{r}+\frac{X}{\phi}\right)\\ 1 & r_1\leq\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)-\overline{\alpha}\beta\left(\overline{r}+\frac{X}{\phi}\right)\end{cases}$ which is consistent with the condition $\overline{\lambda}^N=\int_\Delta^{+\infty}\lambda^N(r_1)dG(r_1)=G\left(\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)-\overline{\alpha}\beta\left(\overline{r}+\frac{X}{\phi}\right)\right)=\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right)$ for an opportune value of $\overline{\alpha}\in[0,1]$ that depends on the characteristic of the cdf G and the structural parameters. In other words, the equation

$$G\left(\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)-\overline{\alpha}\beta\left(\overline{r}+\frac{X}{\phi}\right)\right)=\frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu}-1\right)$$

implicitly defines the equilibrium mixed behavioral strategy $\alpha(\Delta,1)=\overline{\alpha}\in0,1]$.

Suppose that $\mu\in[X-\pi\Delta,X]$

The citizens will revolt in the information set $(\delta=0,\rho=1)$ only; otherwise they will accommodate, while the selectorate will choose $\rho(0)=0$ and $\rho(\Delta)=1$. Then

$$EU^N(\lambda(r_1)=1)=\Delta+\frac{X}{\phi}+\beta\left(\overline{r}+\frac{X}{\phi}\right)\leq EU^N(\lambda(r_1)=0)=r_1+\frac{X}{\phi}\Leftrightarrow \tag{A30}$$

$$\Leftrightarrow r_1+\frac{X}{\phi}\geq\Delta+\frac{X}{\phi}+\beta\left(\overline{r}+\frac{X}{\phi}\right)\Leftrightarrow r_1\geq\Delta+\beta\left(\overline{r}+\frac{X}{\phi}\right)\Leftrightarrow \tag{A31}$$

$$\Leftrightarrow \lambda^N(r_1) = \begin{cases} 1 & r_1 \le \Delta + \beta\left(\bar{r} + \dfrac{X}{\phi}\right) \\ 0 & r_1 \ge \Delta + \beta\left(\bar{r} + \dfrac{X}{\phi}\right) \end{cases}$$

which means $\overline{\lambda}^N = G\left(\Delta + \beta\left(\bar{r} + \frac{X}{\phi}\right)\right)$ and $P(C|\delta = \Delta) = \frac{\pi \times 1}{\pi \times 1 + (1-\pi) \times G\left(\Delta + \beta\left(\bar{r} + \frac{X}{\phi}\right)\right)} =: \Pi\left(\overline{\lambda}^N\right) > \pi$. Hence when $\mu \in [X - \pi\Delta, X]$ we have a Sequential equilibrium with $\lambda^C(r_1) = 1\ \forall\ r_1$, $\lambda^N(r_1) = \begin{cases} 1 & r_1 \le \Delta + \beta\left(\bar{r} + \frac{X}{\phi}\right) \\ 0 & r_1 \ge \Delta + \beta\left(\bar{r} + \frac{X}{\phi}\right) \end{cases}$, $\rho(0) = 0$, $\rho(\Delta) = 1$, $\alpha(0,1) = 1$ and $\alpha(\Delta,1) = \alpha(\Delta,0) = \alpha(0,0) = 0$.

Suppose that $\mu \in [X, +\infty)$

The citizens are passive players that will always accommodate, hence we have returned to the reciprocal accountability model analyzed in Gilli and Li (2013) and we can refer to that result without any further calculations.

Now we can sum up these calculations in the following general proposition, which is the formal counterpart of proposition 1.

Proposition 5. The first-stage game has the following Sequential Equilibria:

1. when $\mu \in [0, X - \Delta]$, there exists a continuum of Sequential Equilibria where

$$\begin{aligned} &\lambda^C(r_1) = 1, \lambda^N(r_1) = 0, \\ &\rho(0) \in [0,1], \rho(\Delta) \in [0,1], \alpha(\Delta,1) = \alpha(\Delta,0) = \alpha(0,0) = \alpha(0,1) = 1; \end{aligned}$$

2. when $\mu \in [X - \Delta, X - \pi\Delta]$, there exists a continuum of Sequential Equilibria:

$$\begin{aligned} &\lambda^C(r_1) = 1, \lambda^N(r_1) = G(H(\Delta, \beta, \bar{r}, X, \phi)) \\ &\rho(0) \in [0,1], \rho(\Delta) = 1, \alpha(\Delta,1) = \overline{\alpha}, \alpha(\Delta,0) = 1, \alpha(0,0) = 1, \alpha(0,1) = 1; \end{aligned}$$

$\overline{\alpha}$ and $H(\Delta, \beta, \bar{r}, X, \phi)$ are defined by the equations $G\left(\Delta + \beta\left(\bar{r} + \frac{X}{\phi}\right) + \overline{\alpha}\beta\left(\bar{r} + \frac{X}{\phi}\right)\right) = \frac{\pi}{1-\pi}\left(\frac{\Delta}{X-\mu} - 1\right)$ and $\int_{\Delta}^{H(\Delta,\beta,\bar{r},X,\phi)} \lambda^N(\theta_1, r_1) dG(r_1) = \dfrac{\pi}{1-\pi}\left(\dfrac{\Delta}{X-\mu} - 1\right)$.

3. when $\mu \in [X - \pi\Delta; X]$, there exists a unique Sequential Equilibrium where

$$\begin{aligned} &\lambda^C(r_1) = 1, \lambda^N(r_1) = \begin{cases} 1 & r_1 \le \Delta + \beta\left(\bar{r} + \dfrac{X}{\phi}\right) \\ 0 & r_1 \ge \Delta + \beta\left(\bar{r} + \dfrac{X}{\phi}\right) \end{cases}, \\ &\rho(0) = 0, \rho(\Delta) = 1, \alpha(\Delta,1) = 0, \alpha(\Delta,0) = 0, \alpha(0,0) = 0, \alpha(0,1) = 1; \end{aligned}$$

4. when $\mu \in [X, +\infty)$ and $\phi \le \frac{X}{X + \pi\Delta}$, there exists a unique Sequential Equilibrium, where

$$\begin{aligned} &\lambda^C(r_1) = 1, \lambda^N(r_1) = 0, \\ &\rho(0) = 1, \rho(\Delta) = 1, \alpha(\Delta,1) = 0, \alpha(\Delta,0) = 0, \alpha(0,0) = 0, \alpha(0,1) = 0; \end{aligned}$$

5. when $\mu \in [X, +\infty)$ and $\phi \ge \frac{X}{X + \pi\Delta}$, there exists a unique Sequential Equilibrium, where $\lambda^C(r_1) = 1, \lambda^N(r_1) = \begin{cases} 1 & r_1 \le \Delta + \beta\left(\bar{r} + \frac{X}{\phi}\right) \\ 0 & r_1 \ge \Delta + \beta\left(\bar{r} + \frac{X}{\phi}\right) \end{cases}$, $\rho(0) = 0, \rho(\Delta) = 1, \alpha(\Delta,1) = 0, \alpha(\Delta,0) = 0, \alpha(0,0) = 0, \alpha(0,1) = 0$.

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