A Theory of Institutional and Coercive Power Sharing

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Abstract

Confronting a commitment problem, autocrats frequently share power with the opposition. This paper presents a formal model that incorporates the two core elements of power-sharing arrangements: committing to deliver more spoils to the opposition, and reallocating coercive power toward the opposition. The second element is uncommon in existing models and yields new insights. Equilibrium power sharing requires three conditions. First, the opposition poses a credible rebellion threat, as in existing models. Second, the ruler willingly shares power rather than triggers a revolt. This is not guaranteed because sharing power shifts power toward the opposition, which creates a new commitment problem for the opposition. Third, the opposition willingly accepts a power-sharing deal rather than revolts. This depends on whether the coercive consequences of power sharing more greatly bolster the opposition's offensive or defensive capabilities. Even if all three conditions are met, the opposition may prefer to wait for a future power-sharing deal.

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1 Introduction

When and why rulers divide political power is a central question in the study of political institutions. Democratic regimes, by definition, share some degree of power, but authoritarian regimes vary widely in their institutional arrangements. In some regimes, a single ruler is absolute and serves for life, with no institutionalized bodies present to check his decisions and ambitions. But many authoritarian regimes feature different types of power-sharing arrangements.

In contemporary authoritarian regimes, it is common to co-opt members of rival parties or ethnic groups with cabinet positions or by providing opportunities to win seats in a national legislature (Gandhi 2008; Arriola 2009; Blaydes 2010; Francois et al. 2015; Roessler 2016; Guriev and Treisman 2019; Meng 2020). Civil wars often end with power-sharing settlements that include provisions such as military integration or regional autonomy (Hartzell and Hoddie 2003; Glassmyer and Sambanis 2008; Walter 2009; Cederman et al. 2015, 2022; Germann and Sambanis 2021). In many historical European regimes, monarchs allocated rights over land and allowed nobles to veto requests for extraordinary taxes (North and Weingast 1989; Stasavage 2011; Cox and Dincecco 2021; Kenkel and Paine 2023). Later in European history, rulers often responded to threats of mass unrest by expanding the franchise. These concessions sometimes yielded full-blown democracies, but often reserved significant powers for elites and thus constituted a form of authoritarian power sharing (Acemoglu and Robinson 2006; Przeworski 2009; Aidt and Jensen 2014; Ansell and Samuels 2014; Albertus and Menaldo 2018; Miller 2021). Hybrid electoral authoritarian regimes spread beyond Europe during the colonial period and after the Cold War ended (Levitsky and Way 2010; Miller 2020; Lee and Paine 2024).

This paper provides a theoretical examination of when and why dictators share power as well as how these decisions affect authoritarian regime survival. Canonical models of political transitions provide the departure point. The basic premise in game-theoretic models such as Acemoglu and Robinson (2000, 2001, 2006), Castañeda Dower et al. (2018, 2020), and Powell (2023) is that autocrats face a commitment problem. The opposition can periodically mobilize a violent threat, which the ruler would prefer to buy off with temporary concessions.[1] However, the ruler cannot commit to offer concessions in any future periods in which the opposition lacks a coercive threat. When societal threats arise rarely, the opposition rejects bargains involving *temporary* transfers only because its shadow of the future is unfavorable. Co-opting the opposition requires *permanent* power-sharing concessions, given the autocrat's commitment problem.[2]

The main motivation for the present model is that most power-sharing deals do more than simply enhance the ruler's commitment ability. Meng et al. (2023) distinguish power-sharing arrangements from other modes of co-optation by specifying two core elements: (1) an *institutional* mechanism to share spoils between the ruler and opposition, and (2) a reallocation of *coercive* power that favors the opposition. Existing theories of authoritarian power sharing universally incorporate the institutional mechanism, but commonly overlook the coercive aspect.

Shifting power toward the opposition yields two, countervailing, consequences. On the one hand, the opposition can go on the *offensive* to threaten the ruler. Rivals can leverage powerful cabinet positions to usurp the ruler in a coup, rebels who retain their arms or are integrated into the national

[1]The Roman poet Juvenal satirically referred to such provisions as "bread and circus." As contemporary examples, amid the Arab Spring protests in 2011, the Saudi king responded by raising the minimum wage, increasing unemployment benefits, constructing apartments, and providing public-sector jobs; see https://www.irishtimes.com/news/saudi-king-announces-huge-spending-to-stem-dissent-1.576600. Amid the uprising in the Soviet Union in 1991, the students and other protesters demanded a rock and roll concert, and Soviet officials obliged by allowing Metallica to play a free-admission outdoor show to a crowd of 1.6 million in Moscow; see https://www.wearethepit.com/2023/04/that-time-metallica-played-a-free-concert-for-over-1-million-fans/.

[2]Other models and related work provide microfoundations for how formal rules create expectations about prohibited behavior and make it easier to monitor transgressions, which facilitates mobilization by the opposition to protect their privileges (Weingast 1997; Tucker 2007; Myerson 2008; Fearon 2011; Gehlbach and Keefer 2011).

military can attack the ruler, and regional autonomy deals might empower local interests to secede. These are key drawbacks of sharing power, from the ruler's perspective. At best, an enhanced offensive threat compels the ruler to offer greater concessions to the opposition. At worst, the ruler can lose his throne.

On the other hand, power-sharing deals may be unenforceable absent a reallocation of power that ties the ruler's hands. In the typical authoritarian setting of weak institutions and non-credible third-party constraints (Svolik 2012), rulers can shut down parliament, ignore court rulings, or cancel elections. Or, more subtly, rulers can engage in stealth tactics that erode the value of these institutions without overt transgressions (Varol 2014).[3] Without bolstering the opposition's ability to *defend* its newfound spoils, sharing power may fail to solve the autocrat's commitment problem.

The model incorporates these foundational institutional and coercive aspects of authoritarian power sharing. Across an infinite horizon, a ruler bargains over spoils with an opposition actor who periodically poses a threat of revolt. The ruler makes a continuous choice over how much power to share, with positive levels creating a permanent basement level of spoils for the opposition (commitment effect), while also raising the opposition's probability of succeeding in a revolt (threat-enhancing effect).[4]

[3]Threats of subversion are present in democracies as well (Helmke et al. 2022; Luo and Przeworski 2023).

[4]For other models in which sharing power improves the opposition's coercive power, see Dal Bó and Powell (2009); Francois et al. (2015); Meng (2019); Paine (2021, 2022); Luo (2023); Kenkel and Paine (2023). However, each of these models lacks at least one of the two key elements of the present and aforementioned canonical models: (a) threats fluctuate over time, which creates a commitment problem because the ruler cannot commit to future transfers beyond what is guaranteed by power-sharing institutions, and (b) sharing power enables the ruler to deliver more spoils. The novel results here arise from analyzing the interaction of the commitment and threat-enhancing effects.

Three conditions are necessary for the ruler to share power in equilibrium. First, *opposition credibility*: the opposition must pose a credible threat to revolt if the ruler does not offer to share power. This recovers a common result from existing theories. In fact, in most of the aforementioned models, this condition is both necessary and sufficient for power sharing to occur in equilibrium.

Second, *ruler willingness*: the ruler must prefer to share power rather than face a revolt. Unlike existing theories, this condition does not always hold in the present model because of the threat-enhancing effect. The ruler might prefer to incur costly fighting rather than shift a substantial amount of power in favor of the opposition. This result highlights a commitment problem faced by the *opposition*, contrary to the standard focus on the *autocrat's* commitment problem. If the opposition could credibly promise to not leverage all the additional coercive strength conferred by a power-sharing deal, then a deal must exist that both sides prefer to conflict.[5]

Third, *opposition willingness*: the opposition must prefer to accept a power-sharing deal rather than revolt. The generic weakness of authoritarian institutions limits the amount of spoils a ruler can permanently transfer to the opposition. The coercive consequences of sharing power can affect opposition willingness in either of two directions. On the one hand, the threat-enhancing effect makes opposition willingness harder to hold. For a fixed limit on the opposition's basement spoils, greater coercive capacity increases the opposition's propensity to revolt. On the other hand, a stronger opposition is better able to defend its spoils, which raises the limit on basement spoils. Thus, depending on whether the coercive element of power sharing more greatly affects the opposition's defensive or offensive capabilities, empowering the opposition may either undermine or constitute the foundation for a power-sharing deal. Concomitantly, coercive hand tying sometimes benefits and sometimes harms the ruler.

[5]Examining a distinct form of the opposition's commitment problem, Acemoglu et al. (2015) explain how small initial reforms can engender a slippery slope by which elites eventually concede more to the opposition than originally intended. Similarly, Fearon and Francois (2020) formally examine the breakdown of elite-biased constitutions in favor of the masses.

Even if opposition credibility, ruler willingness, and opposition willingness are met, a power-sharing deal is still not guaranteed. The prospect of gaining strength in the future via the threat-enhancing effect may make the opposition willing to wait for a power-sharing deal, as opposed to revolting if the ruler does not offer to share power at present. When a *weak version of the opposition credibility constraint* fails,

true, the unique equilibrium is in mixed strategies, and thus either power sharing or conflict can occur along the equilibrium path. This differs from existing models in which the ruler's continuous choice over power sharing eliminates a mixing equilibrium (Acemoglu and Robinson 2017; Castañeda Dower et al. 2020), as these models do not include a threat-enhancing effect.

In sum, power-sharing deals generally bolster the opposition's ability to coerce the ruler. Introducing this element to canonical models yields substantially different results regarding the conditions under which (a) power sharing succeeds at maintaining stability and (b) the ruler chooses to share power. Power sharing is, in one sense, harder than implied by theories that include a commitment but not threat-enhancing effect; either the ruler or opposition might reject a power-sharing deal for reasons unique to the present model. Nonetheless, the coercive consequences of sharing power may be necessary to enforce a deal.

2 Model Setup

A ruler and opposition actor bargain over spoils throughout an infinite-horizon interaction. Periods are denoted by $t = 1, 2, 3\dots$ and the players share a common discount factor $\delta \in (0, 1)$. Total societal output equals 1 in each period. The ruler begins each period t with control over a fraction $1 - \pi_{t-1}$ of state spoils, with π_{t-1} comprising the basement level of spoils for the opposition. At the outset of the game, $\pi_0 = 0$. I refer to this dynamic state variable as the level of power sharing.

In every period, Nature draws an iid threat posed by the opposition, which is High with probability

$r \in (0,1)$ and Low with complementary probability. The state variable is $\Omega_r \in \{H, L\}$. No strategic actions occur in a low-threat period, $\Omega_r = L$, and the level of power sharing is unchanged, $\pi_t = \pi_{t-1}$. The ruler consumes $1 - \pi_t$ and the opposition consumes π_t, and they move to the next period with respective continuation values denoted as V_R and V_O.

In a high-threat period, $\Omega_r = H$, the ruler sets the power-sharing variable and offers a temporary transfer. The ruler can choose $\pi_t > \pi_{t-1}$ exactly once, which is captured by the state variable $\Omega_\pi \in \{A, P\}$. The state is $\Omega_\pi = A$ (autocracy) if $\pi_{t-1} = 0$, in which case the ruler's choice space is $\pi_t \in [0, \overline{\pi}]$. The variable $\overline{\pi} \in (0,1]$ is an exogenously determined upper bound on the amount of power the ruler can share, which I discuss more below. Alternatively, the state is $\Omega_\pi = P$ (power sharing) if $\pi_{t-1} > 0$, in which case π_t is fixed at π_{t-1}. I drop the time script and write $\pi_t = \pi$ wherever it does not introduce confusion.

The temporary transfer is denoted as $x_t \in \{\varnothing\} \cup [0, 1-\pi]$. The numerical bounds on x_t express that the ruler cannot demand a net transfer from the opposition nor offer more than total societal output in that period. Choosing $x_t = \{\varnothing\}$ triggers an immediate conflict; we can think of this as the ruler as committing an atrocity or attempting to directly occupy the opposition's territory, which necessarily prompts an armed response.[6]

The opposition responds to the proposal $\{\pi_t, x_t\}$ by accepting or revolting (unless the ruler chose $x_t = \{\varnothing\}$, at which point a conflict occurs immediately). Acceptance yields a split of $1-\pi_t-x_t$ for the ruler and $\pi_t + x_t$ for the opposition, and they move to the next period with the same respective continuation values as following a low-threat period. If conflict occurs, the opposition wins with probability $p(\pi_t) \in (0,1]$, and the ruler survives with complementary probability. Fighting ends the game; the winner consumes $1-\kappa$ in the period of the conflict and every subsequent period, for $\kappa \in (0,1)$, which captures the costliness of fighting. The loser consumes 0 in the period of the conflict and every subsequent period.

[6]For some parameter values, the ruler can induce conflict even upon making a strictly positive offer. Allowing $x_t = \{\varnothing\}$ ensures that the ruler can induce a conflict in any period.

Sharing more power, i.e., raising π_t, creates two main consequences. First, it enhances the ruler's *institutional commitment* to redistribute more spoils because the opposition consumes at least π_t in every subsequent period. Equating power sharing with a basement level of spoils, or permanent control over an asset, follows the approach in Powell (2023). Others model the commitment effect in terms of allowing the opposition to win elections and set the policy agenda, either with a binary choice in which the opposition sets policy in all future periods (Acemoglu and Robinson 2006) or a continuous choice over the fraction of periods in which the opposition can set policy (Castañeda Dower et al. 2018). It is straightforward to demonstrate that either set of microfoundations for a power-sharing deal can yield equivalent consumption streams. The basement spoils conceptualization sidesteps distinct questions about when rulers are willing to completely step down from power upon losing elections, as studied in models of self-enforcing democracy (Przeworski 1991; Przeworski et al. 2015; Chacón et al. 2011).

Second, raising π_t reallocates coercive power. Sharing power creates a *threat-enhancing effect* by raising the opposition's probability of succeeding in a revolt. I assume $p(\pi_t) = \underline{p}$ if $\pi_t = 0$ and $p(\pi_t) = \overline{p} - \epsilon(\pi_t)$ if $\pi_t > 0$, for $0 < \underline{p} < \overline{p} < 1$. That is, $\underline{p}$ is the opposition's baseline probability of winning, which jumps discretely to a higher value $\overline{p}$ for any positive amount of power sharing.[7] The value $\overline{p} - \underline{p}$ expresses the magnitude of the threat-enhancing effect. The additional term $\epsilon(\pi_t)$ satisfies $\epsilon'(\pi_t) < 0$ and $\epsilon(1) = 0$, which ensures that $p(\pi_t)$ strictly increases in π_t for all $\pi_t \in [0, 1]$.[8]

[7]This simple functional form enables characterizing the opposition's coercive capacity under power sharing in a single and easily interpretable parameter, $\overline{p}$. It is straightforward, using a more general functional form, to prove the existence of a compact set in which sharing a positive amount of power yields peaceful bargaining (see footnote 19), but at the cost of possibly violating uniqueness and (even if uniqueness holds) greatly complicating the comparative statics analysis.

[8]Throughout, I assume ϵ is infinitesimal and write it explicitly only where it affects the results. This element is purely for technical convenience; it rules out multiple equilibria that would otherwise arise from the ruler's indifference over the exact amount of power shared (see footnote 20).

Finally, I assume the commitment and threat-enhancing effects interact to affect the opposition's ability to defend its spoils. The maximum spoils the ruler can permanently transfer, $\overline{\pi}$, weakly increase in the opposition's probability of winning $\overline{p}$. To simplify the analysis, I assume a linear functional form

$$\overline{\pi}(\overline{p}) = \frac{1-\overline{p}}{1-\underline{p}}\pi^{\text{min}} + \frac{\overline{p}-\underline{p}}{1-\underline{p}}\pi^{\text{max}}, \tag{1}$$

with $\pi^{\text{max}} \geq \pi^{\text{min}} > 0$. Thus, higher values of $\overline{p}$ put more weight on π^{max}, and at the bounds, $\overline{\pi}(\underline{p}) = \pi^{\text{min}}$ and $\overline{\pi}(1) = \pi^{\text{max}}$.[9] A natural interpretation is that π^{min} expresses the inherent strength of institutions: the maximum amount the ruler can write down on paper that is credible to permanently give away, if the opposition attains its lower-bound coercive capabilities $\underline{p}$. A natural interpretation is that π^{max} expresses the defensive consequences of coercive power sharing: the ability of a maximally strong ($p = 1$) opposition to defend its control over spoils, captured in a reduced-form way by making feasible higher values of π.[10]

3 Bargaining with Fixed Power-sharing Level

We first characterize optimal actions when fixing $\pi_t = \pi$ and $p(\pi_t) = p$ as exogenous constants. The absence of a strategic power-sharing choice implies that institutional commitment is fixed and there is no threat-enhancing effect. Along a peaceful equilibrium path, the ruler sets the transfer in

[9]A linear functional form ensures the relevant expression for opposition willingness is strictly monotonic in $\overline{p}$ (see Lemma 4).

[10]The following provides an equivalent way to interpret these assumptions. Suppose the ruler's power-sharing choice lacks an upper bound, which enables choosing any $\pi_t \in [0, 1]$ if the state is autocracy. In every low-threat period in the power-sharing state, there is a $1 - \overline{\pi}(\overline{p})$ chance that the ruler can costlessly renege on the power-sharing concession, with $\overline{\pi}(\overline{p})$ as defined in Equation 1. Thus, stronger institutions (higher π^{min}) and greater coercive capabilities for the opposition (higher $\overline{p}$) each reduce the ruler's opportunity to renege. If the ruler sets $\pi_t = 1$, then along the equilibrium path, the opposition's average consumption in low-threat periods is $1 - \overline{\pi}(\overline{p})$.

high-threat periods to make the opposition indifferent between accepting and revolting. Peaceful bargaining requires an intermediate value of π.

3.1 OPPOSITION'S ACTIONS

In a high-threat period, the opposition accepts any transfer proposal x_t satisfying

$$\pi + x_t + \delta V_O \geq p\frac{1-\kappa}{1-\delta}. \tag{2}$$

The Markov assumption ensures that the opposition receives the same offer in every high-threat period, expressed as $x^*(\pi)$. Because high-threat periods arise with frequency r, the continuation value satisfies

$$V_O = \pi + rx^*(\pi) + \delta V_O \implies V_O = \frac{\pi + rx^*(\pi)}{1-\delta}. \tag{3}$$

Setting x_t from Equation 2 to its equilibrium value of $x^*(\pi)$, substituting in V_O from Equation 3, and rearranging yields the no-revolt constraint. Consumption in high-threat periods, $\pi + x^*(\pi)$, is weighted by $1 - \delta(1-r)$ because the opposition decides whether to revolt in a high threat period $(1-\delta)$ and a fraction r of future periods will be high threat (δr). For this reason, future low-threat periods are weighted by $\delta(1-r)$.

$$\underbrace{(1-\delta(1-r))(\pi + x^*(\pi))}_{\text{Consume } \pi + x^*(\pi) \text{ in H periods}} + \underbrace{\delta(1-r)\pi}_{\text{Consume } \pi \text{ in L periods}} \geq \underbrace{p(1-\kappa)}_{\text{Revolt}}. \tag{4}$$

A necessary condition for peaceful bargaining is that the opposition forgoes revolting if it consumes the maximum amount of 1 in every high-threat period, generated by a transfer $x^*(\pi) = 1 - \pi$. Otherwise, the opposition cannot be bought off, as the ruler cannot transfer more than total societal output in a single period. Bargaining is feasible when

$$1 - \delta(1-r) + \delta(1-r)\pi \geq p(1-\kappa). \tag{5}$$

High basement spoils π suffice to satisfy the opposition's incentive-compatibility constraint. As π becomes large, the ruler's inability to commit to make additional transfers in low-threat periods is largely irrelevant because the opposition is nonetheless guaranteed a sizable amount of consumption in such periods. However, low π is insufficient for Equation 5 to fail. The revolt option is low-valued if either the opposition is very weak (low p) or revolts are very costly (high κ). Alternatively, the peaceful path is more highly valued if high-threat periods occur frequently. High r mitigates the ruler's lack of ability to commit to transfers in low-threat periods. Finally, an impatient opposition (low δ) puts little weight on the knowledge that some future periods will be low threat, and therefore its bargaining position will weaken. Instead, an impatient opposition puts more weight on the current-period transfer, which can always be set high enough to exceed the contemporaneous expected value to revolting.[11] As any of these variables hit their bounds, Equation 5 is sure to hold.

Setting Equation 5 as an equality enables deriving a threshold value of π at which peaceful bargaining is possible, formalized in Lemma 1.[12]

Lemma 1 (Threshold basement spoils for peaceful bargaining)**.** *A unique threshold $\hat{\pi}(p) < p(1-\kappa)$ exists such that Equation 5 holds for $\pi \geq \hat{\pi}(p)$, but not otherwise. If $1-\delta(1-r) < p(1-\kappa)$, then $\hat{\pi}(p) > 0$; but otherwise, Equation 5 holds for all $\pi \in [0,1]$. The threshold is*

$$1-\delta(1-r)+\delta(1-r)\hat{\pi}(p) = p(1-\kappa) \implies \hat{\pi}(p) = 1 - \frac{1-p(1-\kappa)}{\delta(1-r)}.$$

Regarding the upper bound on $\hat{\pi}(p)$, when $\pi = p(1-\kappa)$ (which is itself strictly less than 1), the opposition's consumption in every period is at least as large as its reservation value to revolting. This eliminates any incentive to revolt. Furthermore, the threshold is strictly positive only if Equa-

[11]This observation cuts against the general notion (e.g., repeated Prisoner's dilemma) that impatient players are prone to inefficient outcomes (in this case, costly conflict).

[12]The existence claim follows directly from a straightforward application of the intermediate value theorem, and uniqueness from strict monotonicity in π.

tion 5 fails at $\pi = 0$, meaning that a positive level of basement spoils is needed to enable buying off the opposition in a high-threat period.

3.2 Ruler's Actions

Along a peaceful bargaining path, the ruler's expected lifetime consumption stream from the perspective of a high-threat period is

$$1 - \pi_t - x^*(\pi) + \delta V_R,$$

with

$$V_R = 1 - \pi_t - rx^*(\pi) + \delta V_R \implies V_R = \frac{1 - \pi - rx^*(\pi)}{1 - \delta}.$$

Combining these two equations yields the ruler's objective function

$$R(\pi) \equiv (1 - \delta)V_R = 1 - \pi - (1 - \delta(1 - r))x^*(\pi_t). \tag{6}$$

The ruler's consumption stream along a peaceful path strictly decreases in $x^*(\pi)$. Thus, the ruler seeks to minimize transfers, but faces two constraints. First, for the equilibrium path of play to indeed be peaceful, $x^*(\pi)$ must be large enough to satisfy the no-revolt constraint in Equation 4. Thus, one candidate solution is to set $x^*(\pi)$ to satisfy Equation 4 with equality, which makes the opposition indifferent between accepting and revolting. This yields

$$\underbrace{(1 - \delta(1 - r))(\pi + x^*(\pi)) + \delta(1 - r)\pi}_{\text{Peaceful consumption stream}} = \underbrace{p(1 - \kappa)}_{\text{Revolt}} \implies x^*(\pi) = \frac{-\pi + p(1 - \kappa)}{1 - \delta(1 - r)}. \tag{7}$$

Substituting this into Equation 6 yields a per-period average consumption stream for the ruler of $1 - p(1 - \kappa)$. Intriguingly, π does not affect this payoff. A higher value of π reduces the ruler's consumption in low-threat periods (by providing more rents to the opposition not warranted by its contemporaneous threat of revolt), but raises the ruler's consumption in high-threat periods by reducing the temporary transfer x^* needed to buy off the opposition. These two effects perfectly offset because the ruler and opposition discount the stream of transfers in an identical manner. Formally,

$$\frac{dR}{d\pi} = \underbrace{\frac{\partial R}{\partial \pi}}_{\text{Cost}} + \underbrace{\frac{\partial R}{\partial x^*}\frac{\partial x^*}{\partial \pi}}_{\text{Benefit}}, \tag{8}$$

which equals 0 because $\frac{\partial R}{\partial \pi} = -1$ and $\frac{\partial R}{\partial x^*}\frac{\partial x^*}{\partial \pi} = -(1-\delta(1-r))\frac{-1}{1-\delta(1-r)} = 1$.[13] Later I show that the ruler's indifference over the exact level of π is broken when we relax the present assumption that $p(\pi)$ is a constant.

The second constraint is that the transfer is non-negative. If $\pi > \hat{\pi}' \equiv p(1-\kappa)$, then the interior-optimal offer violates the lower bound $x_t \geq 0$. In that case, the ruler would set $x_t = 0$ in every high-threat period, which the opposition would accept, and the ruler's per-period average consumption stream is $1 - \pi$.[14]

Alternatively, the ruler can trigger conflict by proposing $x_t \in \{\varnothing\} \cup \big[0, x^*(\pi)\big)$.[15] Conflict yields an expected per-period average payoff for the ruler of $(1-p)(1-\kappa)$.

When the interior-optimal transfer is feasible, $\pi \leq \hat{\pi}'$, the ruler consumes more along a peaceful than conflictual path. Formally, $1 - p(1-\kappa) > (1-p)(1-\kappa)$ reduces to $\kappa > 0$. Thus, the assumed costliness of revolting is sufficient to induce the ruler to buy off the opposition, if possible. This is a standard result. The ruler makes all the bargaining offers, which enables him to hold the opposition down to indifference and thereby consume the entire surplus saved by preventing costly conflict (Fearon 1995). However, when π is very high, the ruler can no longer hold the opposition down to indifference. Rather than countenance the sizable rents permanently conceded

[13] Paine (2023) analyzes this result in more depth.

[14] Unlike the interior case, the ruler's consumption is a function of π because there is no offsetting effect from a lower transfer.

[15] The set $\big[0, x^*(\pi)\big)$ is non-empty only if $\pi < p(1-\kappa)$; therefore, including $x_t \in \{\varnothing\}$ in the choice space ensures the ruler can trigger conflict for any parameter values.

to the opposition, the ruler might prefer conflict. This is true when $\pi > \hat{\pi}'' \in (\hat{\pi}', 1]$,[16] for $\hat{\pi}'' \equiv 1 - (1 - p)(1 - \kappa)$.

3.3 Equilibrium Bargaining Outcomes

Proposition 1 characterizes equilibrium bargaining outcomes.

Proposition 1 (Equilibrium bargaining with fixed power-sharing level)**.** *Suppose $\pi_t = \pi$ and $p_t = p$ are fixed as exogenous constants. The following constitute the equilibria strategy profiles.*[17]

- *If $\pi < \hat{\pi}(p)$, then in every high-threat period, the ruler offers any $x_t = [0, 1 - \pi]$ and the opposition revolts in response to any proposal. Along the equilibrium path, conflict occurs in the first high-threat period.*
- *If $\pi \in [\hat{\pi}(p), \hat{\pi}']$, then in every high-threat period, the ruler offers $x_t = x^*(\pi)$ (defined in Equation 7). The opposition accepts any $x_t \geq x^*(\pi)$ and revolts otherwise. Along the equilibrium path, conflict never occurs.*
- *If $\pi \in (\hat{\pi}', \hat{\pi}'']$, then in every high-threat period, the ruler offers $x_t = 0$, and the opposition accepts any proposal. Along the equilibrium path, conflict never occurs.*
- *If $\pi > \hat{\pi}''$, then in every high-threat period, the ruler offers $x_t = \{\varnothing\}$, and the opposition accepts any numerical proposal. Along the equilibrium path, conflict occurs in the first high-threat period.*

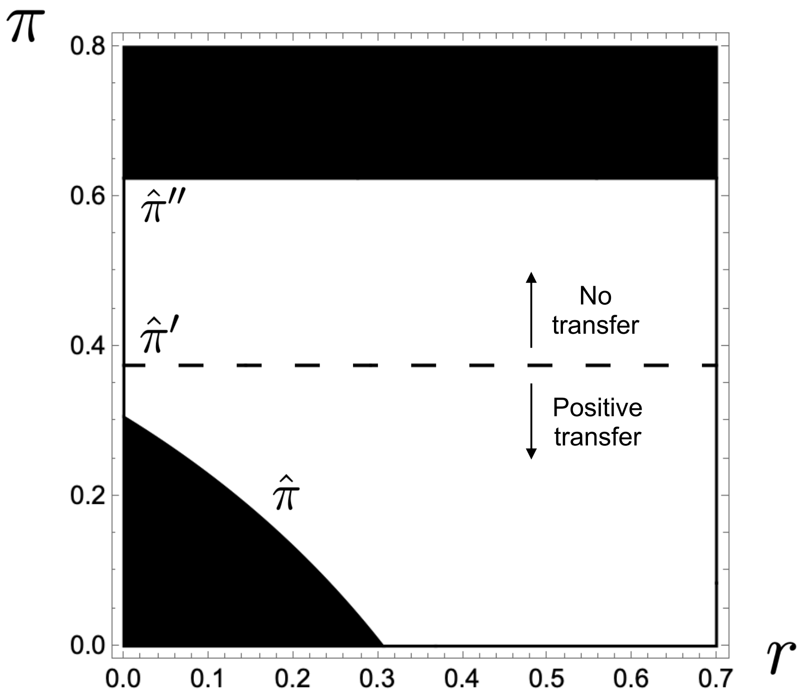
The following figures provide visual intuition for the different cases. Figure 1 presents a region plot with r on the x-axis and π on the y-axis; the other parameters are fixed at values stated in the accompanying note. Black regions indicate that conflict occurs with probability 1 in high-threat periods, and white regions that conflict occurs with probability 0. The figure shows that intermediate values of π facilitate peace—high enough to mitigate the autocrat's commitment problem, but the ruler does not permanently give so much away that he prefers conflict. However, for large r, the

[16]The upper bound is strict for any $p < 1$.

[17]The equilibrium is unique for parameter values in which the equilibrium path entails peaceful bargaining. Multiple equilibria are possible when conflict occurs along the equilibrium path, but all equilibria are payoff equivalent.

ruler's opportunities to buy off the opposition are so frequent that peaceful bargaining is possible even without any basement spoils.

Figure 1: Equilibrium Peace and Conflict



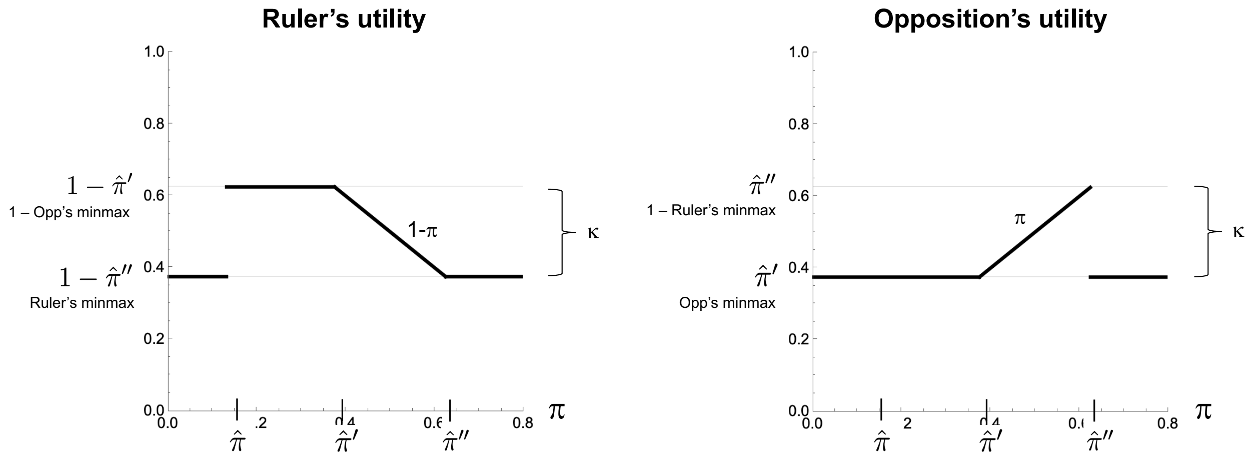
Parameter values: $\delta = 0.9$, $\kappa = 0.25$, $p = 0.5$.

Figure 2 plots as a function of π the average per-period consumption amounts for each player, from the perspective of a high-threat period. When $\pi < \hat{\pi}$, conflict occurs and total surplus equals $1 - \kappa$. Each player's utility is determined by its respective reservation value to conflict, which comprises its minmax payoff.

The ruler's consumption exhibits a discrete jump at $\pi = \hat{\pi}$. This raises basement spoils to a level sufficient to induce the opposition to accept. The ruler consumes all the surplus saved from preventing fighting by making a bargaining offer that holds the opposition down to indifference. By contrast, the opposition consumes an identical amount for any π within a neighborhood of $\hat{\pi}$. Whether or not conflict occurs, the opposition gains its reservation value to revolting.

Once π exceeds $\hat{\pi}'$, the equilibrium transfer goes to 0 and the magnitude of π becomes the sole determinant of payoffs. The ruler faces a tradeoff between preventing conflict, which raises total

Figure 2: Equilibrium Consumption for Each Player



Parameter values: $\delta = 0.9$, $\kappa = 0.25$, $p = 0.5$, $r = 0.2$.

surplus, and pocketing a larger share of consumption. For fairly low values of π in this range, the former consideration wins out. The interaction is peaceful, and the ruler's consumption strictly decreases in π while the opposition's strictly increases. This is the one set of parameter values in which the opposition consumes strictly more than its reservation value to fighting.

However, once π exceeds $\hat{\pi}''$, a peaceful interaction would drive the ruler's consumption below its minmax. This prompts the ruler to trigger a conflict, despite destroying surplus. Consequently, the ruler and opposition's respective consumption amounts are identical to the $\pi < \hat{\pi}$ region.

4 POWER-SHARING EQUILIBRIUM

Returning to the full model enables an examination of optimal power-sharing choices. After presenting preliminary results, I derive the three key conditions: (strong) opposition credibility, ruler willingness, opposition willingness. Each of these three is individually necessary and jointly sufficient for power sharing to occur with positive probability. However, a fourth condition, weak opposition credibility, is needed to ensure that power sharing occurs with probability 1.

Once the game has reached the power-sharing state, $\Omega_\pi = P$, Proposition 1 characterizes equilibrium actions, with $p = \overline{p}$ and with π set to whatever level the ruler chose when the state switched from $\Omega_\pi = A$ to $\Omega_\pi = P$.[18] Thus, the following analysis characterizes optimal actions in the autocratic state, $\Omega_\pi = A$.

4.1 Preliminary Results

In the power-sharing state, the opposition's probability of winning is $\overline{p}$. Therefore, using Lemma 1, the relevant threshold value of π is:[19]

$$\pi^* \equiv \hat{\pi}(\overline{p}). \tag{9}$$

Recall that, given the parameter $p = \overline{p}$, this is the lowest value of π (the amount the opposition consumes in a low-threat period) at which the opposition forgoes revolting upon consuming 1 in every high-threat period. Consequently, the opposition revolts in response to any proposal that includes $\pi \in (0, \pi^*)$, whereas for all $\pi \geq \pi^*$ there is a corresponding offer $x_t = \max\{x^*(\pi), 0\} \leq 1$ that induces the opposition to accept, for $x^*(\pi)$ defined in Equation 7.

Lemma 2 (Preliminary results for opposition's actions)**.**

- *The opposition accepts any proposal such that $\pi_t \geq \pi^*$ and $x_t \geq \max\{x^*(\pi), 0\}$.*

[18] This highlights the simplifying benefit of assuming $\pi_t = \pi_{t-1}$ if $\Omega_\pi = A$. Otherwise, we would have to consider additional opportunities to raise π_t. This element of the setup is the same as in Castañeda Dower et al. (2018). For a model that examines the consequences of multiple shifts in autocratic power consolidation, see Luo (2023).

[19] A similar threshold is guaranteed to exist even with a more general functional form for $p(\pi)$, as suggested in footnote 7, although uniqueness is not guaranteed. Suppose $p(\pi)$ is continuous, weakly increasing in π, and bounded between $\underline{p} > 0$ and 1. The implicit characterization of π^* is now $1-\delta(1-r)+\delta(1-r)\pi^* = p(\pi^*)(1-\kappa)$, but the application of the intermediate value theorem to yield existence in Lemma 1 is unchanged: the bounds are the same, and the entire function is still continuous in π because $p(\pi)$ is assumed to be continuous in π. Thus, a compact set exists under which any value of π within its range produces peaceful bargaining. However, whether this set is unique depends on the functional form for $p(\pi)$.

- *The opposition revolts in response to any proposal with* $\pi_t \in (0, \pi^*)$.

The ruler only considers making either of two power-sharing proposals, $\pi_t \in \{0, \pi^*\}$. Proposing any $\pi_t \in (0, \pi^*)$ would raise the opposition's probability of winning without inducing acceptance. This cannot be optimal because the ruler's minmax value to offering $\pi_t = 0$ is $(1 - \underline{p})(1 - \kappa)$, which strictly exceeds $(1 - \overline{p})(1 - \kappa)$. Nor will the ruler share strictly more power than needed to buy off the opposition. To see why, we can modify Equation 8 to express

$$\frac{dR}{d\pi} = \frac{\partial R}{\partial \pi} + \frac{\partial R}{\partial x^*}\frac{\partial x^*}{\partial \pi} + \frac{\partial R}{\partial x^*}\frac{\partial x^*}{\partial p}p'(\pi). \tag{10}$$

The first two effects are the same as in the baseline bargaining analysis, but there is now a third term. Raising the basement level of spoils shifts the distribution of power because $p(\pi)$ is non-constant; by altering the opposition's reservation value, this can affect the size of the transfer needed to buy off the opposition. Specifically, if x^* is interior, the effect of this mechanism is $\frac{\partial R}{\partial x^*}\frac{\partial x^*}{\partial p}p'(\pi) = -(1 - \kappa)p'(\pi) < 0$.[20] Thus, the effect on raising the opposition's reservation value breaks the indifference demonstrated in Equation 8, instead creating a strict preference for the ruler to minimize the extent of power sharing.

These considerations leave $\{0, \pi^*\}$ as the set of possible optimal choices of π_t. The preceding bargaining analysis pins down the corresponding optimal transfers that accompany each power-sharing choice.

[20] The sign follows from $p'(\pi) > 0$. This is the one place where I use the assumption $p(\pi_t) = \overline{p} - \epsilon(\pi_t)$ for all π_t. Relaxing this assumption by setting $\epsilon(\pi_t) = 0$ would not qualitatively change equilibrium outcomes, but is technically convenient to break the ruler's indifference over the exact level of power sharing. Furthermore, this assumption has verisimilitude, as we would expect higher levels of power sharing to yield a higher probability of winning for the opposition. Finally, if $\pi_t > \overline{p}(1 - \kappa)$, then the optimal transfer is 0 and the ruler's per-period payoff is $1 - \pi$, which strictly decreases in π.

Lemma 3 (Preliminary results for ruler's actions)**.** *There are no equilibria in which the ruler puts positive probability on proposals other than* $(\pi_t, x_t) \in \big\{(0, \min\{x^*(0), 1\}), (\pi^*, 1-\pi^*)\big\}$.

Given the binary set of possible optimal proposals, we can express the ruler's strategy as a Bernoulli draw over each choice in a high-threat period, with probability σ_R of proposing $(\pi_t, x_t) = (\pi^*, 1-\pi^*)$ and probability $1-\sigma_R$ of proposing $(\pi_t, x_t) = (0, \min\{x^*(0), 1\})$. Thus, $\sigma_R = 1$ corresponds with a pure strategy of offering to share power in every high-threat period, $\sigma_R = 0$ corresponds with a pure strategy of only ever offering temporary transfers, and the ruler plays a mixed strategy for any $\sigma_R \in (0, 1)$. Similarly, I write the opposition's probability of accepting $(\pi_t, x_t) = (0, \min\{x^*(0), 1\})$ as σ_O, with $\sigma_O = 1$ corresponding with a pure strategy of always accepting the temporary transfer, $\sigma_O = 0$ corresponding to a pure strategy of always revolting if not offered a power-sharing deal, and the opposition plays a mixed strategy in response to a temporary transfer proposal if $\sigma_O \in (0, 1)$. Lemma 2 shows that the opposition necessarily accepts with probability 1 if offered $(\pi_t, x_t) = (\pi^*, 1-\pi^*)$, and thus this component of the opposition's best-response function is presumed in all the subsequent propositions.[21]

4.2 Opposition Credibility

The first key condition for determining equilibrium outcomes is *opposition credibility*.[22] Suppose the ruler never shares power along the equilibrium path, $\sigma_R = 0$. The opposition has a credible threat to revolt in a high-threat period if and only if $\hat{\pi}(\underline{p}) > 0$, for $\hat{\pi}$ defined in Lemma 1. This can be written as

$$1 - \delta(1-r) < \underline{p}(1-\kappa). \tag{11}$$

[21] In the following analysis, I characterize the opposition's optimal responses only to the set of proposals in Lemma 3. This simplifies the analysis by ignoring responses to proposals that cannot be part of an equilibrium strategy profile.

[22] Later I refer to this as the *strong* opposition credibility condition to contrast it with the weak opposition credibility condition derived when examining mixed-strategy equilibria.

Otherwise, the opposition can be bought off with temporary transfers in every high-threat period, thus obviating their threat to revolt if not offered power-sharing provisions.[23]

> **Proposition 2** (Peaceful autocracy if opposition credibility fails)**.** *If opposition credibility fails (Equation 11), then the unique equilibrium strategy profile includes* $\sigma_R = 0$ *and* $\sigma_O = 1$*; and* $\min\{x^*(0), 1\} = x^*(0)$*. Along the equilibrium path, the ruler never shares power and conflict never occurs.*

A plausible conjecture, following the standard logic of models of costly conflict, is that if opposition credibility holds, then the ruler necessarily offers $\pi_t = \pi^*$ in the first high-threat period. The ruler wants to prevent a revolt because, by virtue of making all the bargaining offers, he consumes the entire surplus saved by preventing conflict.

This conjecture, however, is incorrect for the present model. Sharing power boosts the opposition's probability of succeeding in a revolt from $\underline{p}$ to $\overline{p}$. The threat-enhancing effect creates a wedge between autocratic rule ($\pi_t = 0$) and a power-sharing regime ($\pi_t > 0$). Thus, even if opposition credibility holds, there are three other possibilities besides a pure-strategy power-sharing equilibrium.

4.3 Ruler Willingness

The second key condition for determining equilibrium outcomes is *ruler willingness*. If opposition credibility holds, the ruler is willing to share power if and only if its maximum consumption stream along a peaceful path exceeds its utility to incurring a revolt. This is not guaranteed because of the threat-enhancing effect.

Given Lemma 3, the relevant comparison in a high-threat period is between sharing the minimum amount of power to induce peace ($\pi_t = \pi^*$) and not sharing any power ($\pi_t = 0$) and facing a revolt

[23]The revolt threat nonetheless affects the outcome by influencing the size of the transfers (see Equation 7).

with the opposition's probability of winning set to $\underline{p}$. This yields

$$1 - \pi^* - (1 - \delta(1 - r))x^*(\pi^*) \geq (1 - \underline{p})(1 - \kappa), \tag{12}$$

which simplifies to

$$(\overline{p} - \underline{p})(1 - \kappa) \leq \kappa. \tag{13}$$

Thus, ruler willingness is determined by (a) the threat-enhancing effect (the magnitude of the shift in the distribution of power),[24] compared to (b) the surplus destroyed by fighting, κ. As suggested by canonical results on conflict bargaining (e.g., Fearon 1995), more destructive conflict harms the ruler because—by virtue of making all the bargaining offers—he consumes the entire surplus saved by preventing fighting. However, in the present model, this does not guarantee that the ruler will take the actions needed to prevent fighting. When sharing power is necessary to buy off the opposition, the loss from the adverse shift in power may outweigh the gains from preventing costly conflict.

An alternative way of framing this result is that ruler willingness can fail because the threat-enhancing effect creates a commitment problem for the opposition. Typically, in conflict bargaining models, we think of conflict occurring because the *ruler* cannot commit to deliver a sufficient amount of spoils to the opposition. However, in this case, conflict occurs because the *opposition* cannot commit to not leverage its higher probability of winning a revolt. For the parameter range in which opposition credibility holds and ruler willingness fails, a Pareto-improving deal exists. Suppose that, following a power-sharing deal, the opposition could commit to bargain as if its probability of winning was some $p' \in (\underline{p}, \underline{p} + \frac{\kappa}{1-\kappa})$. This would ensure, on the one hand, that the opposition does better than revolting against autocratic rule, in which its per-period expected reservation value is $\underline{p}(1 - \kappa)$. And, on the other hand, the adverse shift in the ruler's bargaining position is not so large that the ruler prefers to initiate conflict, which preserves the surplus that

[24]This term is multiplied by post-conflict surplus, which affects both players' reservation value to fighting.

conflict would have destroyed. Formally, as $\overline{p} \to \underline{p}$, Equation 13 is sure to hold. Thus, both sides would consume a fraction of the surplus saved by preventing conflict. However, the opposition's inability commit to this deal after the shift in power has occurred can cause ruler willingness to fail.

Consequently, even if the autocrat is able to take actions to alleviate his commitment problem, he may choose not to do so because of the opposition's commitment problem. This highlights a commonly overlooked source of intractability in the autocrat's commitment problem.

> **Proposition 3** (Conflict if ruler willingness fails)**.** *If opposition credibility holds (Equation 11) and ruler willingness fails (Equation 12), then the unique equilibrium strategy profile includes $\sigma_R = 0$ and $\sigma_O = 0$. Along the equilibrium path, the ruler never shares power and conflict occurs in the first high-threat period.*

4.4 Opposition Willingness

The third key condition for determining equilibrium outcomes is *opposition willingness*. Suppose opposition credibility and ruler willingness both hold, which implies the ruler's optimal power-sharing choice is $\pi_t = \pi^*$. However, if the upper bound on the amount of power sharing is too low, $\overline{\pi} < \pi^*$, then the ruler cannot give away basement spoils large enough to enable buying off the opposition. Depending on whether the offensive or defensive consequences of shifting power predominate, the threat-enhancing effect can push toward or against opposition willingness holding.

The opposition willingness condition requires

$$1 - \delta(1 - r) + \delta(1 - r)\overline{\pi} \geq \overline{p}(1 - \kappa). \tag{14}$$

Using the functional form from Equation 1, with $\pi^{\min}$ capturing the strength of institutions and

$\pi^{\max}$ capturing the defensive value of coercive power sharing, this can be written as

$$1-\delta(1-r)+\delta(1-r)\left(\frac{1-\overline{p}}{1-\underline{p}}\pi^{\min}+\frac{\overline{p}-\underline{p}}{1-\underline{p}}\pi^{\max}\right)\geq\overline{p}(1-\kappa). \tag{15}$$

If the opposition is credible but not willing, then conflict occurs along the equilibrium path.

Proposition 4 (Conflict if opposition willingness fails)**.** *If opposition credibility holds (Equation 11) and opposition willingness fails (Equation 14), then the unique equilibrium strategy profile includes $\sigma_R = 0$ and $\sigma_O = 0$.*[25] *Along the equilibrium path, the ruler never shares power and conflict occurs in the first high-threat period.*

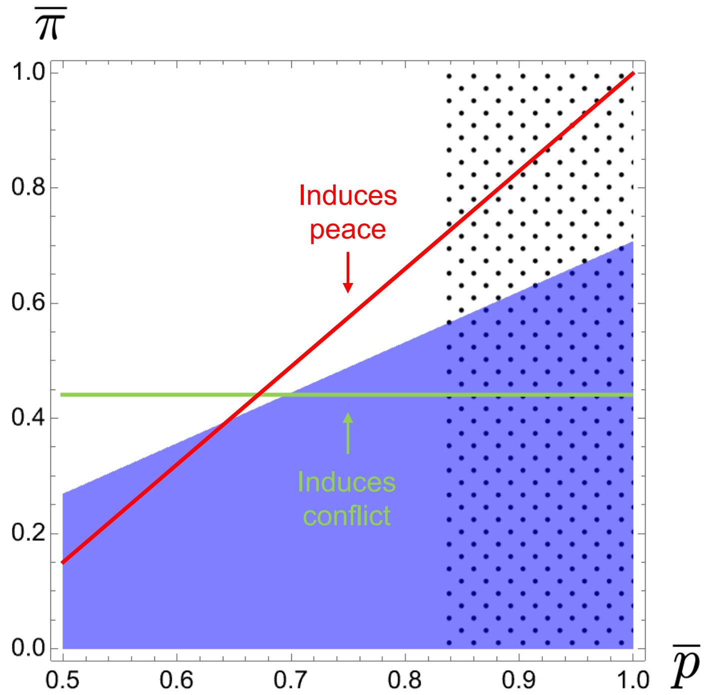
The coercive consequence of sharing power, which raises p_t from $\underline{p}$ to $\overline{p}$, can make opposition willingness either more or less prone to failure. This hinges on the balance between the opposition's offensive and defensive capabilities. Figure 3 illustrates the two most interesting cases. The figure is a region plot with $\overline{p}$ on the x-axis and $\overline{\pi}$ on the y-axis. The purple region indicates where opposition willingness fails, whereas it holds in the white region. The dotted black region indicates parameter values in which ruler willingness fails.

First, the green line depicts a case in which $\overline{\pi}$ is constant. Increasing $\overline{p}$ strictly decreases the range of parameter values in which opposition willingness holds. The opposition becomes better able to succeed in a revolt (greater threat-enhancing effect), but without an offsetting effect from improving the opposition's ability to defend its control over spoils. This can easily be seen in Equation 14 when fixing $\overline{\pi}$ as a constant; the right-hand side increases in $\overline{p}$ whereas the left-hand side does not. For these parameter values, large $\overline{p}$ causes opposition willingness to fail.

Second, the red line depicts a case in which $\pi^{\min}$ is very low and $\pi^{\max}$ is very high. Therefore, a stronger threat-enhancing effect greatly improves the opposition's ability to defend its control over spoils. At the limit, a perfectly strong opposition can enforce any deal, $\pi^{\max} = 1$, which guarantees

[25] Note that $\sigma_R = 0$ by default; if opposition willingness fails, then the upper bound on π_t prevents the ruler from offering $\pi_t = \pi^*$.

Figure 3: Coercive Effect of Power Sharing and Opposition Willingness



Parameter values: $\delta = 0.9$, $\kappa = 0.25$, $\underline{p} = 0.5$, $r = 0.05$. For the green line, $\pi^{\min} = \pi^{\max} = 0.44$. For the red line, $\pi^{\min} = 0.15$ and $\pi^{\max} = 1$.

that opposition willingness holds. To see this in Equation 14, the left-hand side goes to 1 as $\overline{\pi} \to 1$, whereas the right-hand side is strictly less than 1. Lemma 4 formalizes the full range of parameter values for these cases, along with the full set of alternative cases.

Lemma 4 (Coercive effect of power sharing and opposition willingness)**.**

Part a. Offensive capabilities dominate. *Suppose* $\delta(1-r)\frac{\pi^{max}-\pi^{min}}{1-\underline{p}} < 1 - \kappa$.[26]

1. *If* $1-\delta(1-r)(1-\pi^{min}) > \underline{p}(1-\kappa)$ *and* $1-\delta(1-r)(1-\pi^{max}) < (1-\kappa)$, *then a unique* $\overline{p}' \in (\underline{p}, 1)$ *exists such that opposition willingness holds for all* $\overline{p} \in [\underline{p}, \overline{p}']$ *and fails otherwise.*[27]

[26] In this case, increases in $\overline{p}$ increase the right-hand side of Equation 15 by a greater magnitude than the left-hand side, therefore making opposition willingness harder to hold.

[27] This is the case depicted by the red line in Figure 3. The point where the red line intersects the edge of the purple region is $\overline{p}'$.

2. *If* $1-\delta(1-r)(1-\pi^{min}) < \underline{p}(1-\kappa)$*, then opposition willingness fails for all* $\overline{p} \in [\underline{p}, 1]$.

3. *If* $1-\delta(1-r)(1-\pi^{max}) > (1-\kappa)$*, then opposition willingness holds for all* $\overline{p} \in [\underline{p}, 1]$.

Part b. Defensive capabilities dominate. *Suppose* $\delta(1-r)\frac{\pi^{max}-\pi^{min}}{1-\underline{p}} > 1-\kappa$.

1. *If* $1-\delta(1-r)(1-\pi^{min}) < \underline{p}(1-\kappa)$ *and* $1-\delta(1-r)(1-\pi^{max}) > (1-\kappa)$*, then a unique* $\overline{p}'' \in (\underline{p}, 1)$ *exists such that opposition willingness holds for all* $\overline{p} \in [\overline{p}'', 1]$ *and fails otherwise.*[28]

2. *If* $1-\delta(1-r)(1-\pi^{max}) < (1-\kappa)$*, then opposition willingness fails for all* $\overline{p} \in [\underline{p}, 1]$.

3. *If* $1-\delta(1-r)(1-\pi^{min}) > \underline{p}(1-\kappa)$*, then opposition willingness holds for all* $\overline{p} \in [\underline{p}, 1]$.

The second case raises two additional, pertinent points. First, when high $\overline{p}$ is needed for opposition willingness to hold, this condition comes into tension with ruler willingness. As shown earlier in Equation 13, ruler willingness requires $\overline{p} < \underline{p} + \frac{\kappa}{1-\kappa}$. Thus, as shown with the red line in Figure 3, $\overline{p}$ must be high enough for opposition willingness to hold but not so high that ruler willingness fails. And if the critical threshold for opposition willingness, $\overline{p}''$, is too high, then this tension is impossible to resolve (not pictured). In that case, any value of $\overline{p}$ large enough for opposition willingness to hold violates ruler willingness.

Second, the ruler's utility strictly increases in $\overline{p}$ for some parameter values. This is surprising given the prior discussion of the threat-enhancing effect in conjunction with ruler willingness. Higher $\overline{p}$ improves the opposition's bargaining position, and thus its direct effect is to decrease the ruler's consumption. However, under the conditions in which higher $\overline{p}$ is needed for opposition willingness to hold, the ruler benefits from a coercively stronger opposition; although $\overline{p}$ cannot be so large that ruler willingness fails. Lemma 5 formalizes these two points.

[28]This is the case depicted by the green line in Figure 3. The point where the green line intersects the edge of the purple region is $\overline{p}''$.

Lemma 5 (Ruler can benefit from bolstering opposition coercion)**.** *Suppose the conditions from Lemma 4, Part b, Case 1 hold.*

- ***Part a.*** *If* $\overline{p}'' < \underline{p} + \kappa$*, then for all* $\overline{p} \in [\overline{p}'', \underline{p} + \frac{\kappa}{1-\kappa}]$*, opposition willingness and ruler willingness both hold. If* $\overline{p}'' > \underline{p} + \frac{\kappa}{1-\kappa}$*, then opposition willingness does not hold for any parameter values at which ruler willingness holds.*
- ***Part b.*** *If* $\overline{p} < \overline{p}'' < \underline{p} + \frac{\kappa}{1-\kappa}$*, then the ruler's utility strictly increases if* $\overline{p}$ *is raised to* $\overline{p}''$*.*

These results demonstrate the countervailing offensive and defensive consequences of coercive power sharing. Suppose institutions are weak, which corresponds with a low value of $\pi^{\min}$. If $\pi^{\max}$ is also low, and therefore $\overline{\pi}$ is largely or entirely unresponsive to changes in $\overline{p}$, then sharing power yields a minimal defensive boost for the opposition. The offensive consequences predominate, and power sharing is doomed to fail. By contrast, the result flips if $\pi^{\max}$ is high. Sharing power provides the coercive means the opposition needs to enforce its control over spoils. A coercively strong opposition ensures that opposition willingness holds (although ruler willingness may fail).

4.5 Power Sharing in Pure and Mixed Strategies

Opposition credibility, ruler willingness, and opposition willingness are each necessary conditions for power sharing to occur in equilibrium, as the preceding results demonstrate. For some parameter values in which all three hold, a unique pure-strategy equilibrium exists in which the ruler shares power with probability 1. However, for other parameter values, power sharing occurs in equilibrium with a positive probability, but less than 1, because a fourth key condition fails: *weak opposition credibility*. Once again, the threat-enhancing effect creates a wedge. For some parameter values, the unique equilibrium entails the following mixed strategies in every high-threat period under autocratic rule: the ruler mixes between sharing power and offering temporary transfers only; and, if the ruler does not share power, the opposition mixes between accepting and revolting.

Because opposition willingness holds, the opposition surely accepts a power-sharing proposal. Because opposition credibility holds, the opposition surely rejects a pure-transfers proposal if $\sigma_R = 0$, and thus no power-sharing proposals are forthcoming in the future. Nonetheless, the opposition does not necessarily reject any pure-transfers proposal. Sharing power, by bolstering the opposition's probability of winning a revolt, raises the opposition's consumption above its reservation value under autocratic rule. Consequently, the opposition might accept a pure-transfers proposal at *present* if the ruler is likely to share power in the *future*. This can cause a weak version of the opposition credibility condition to fail.

Formally, assume opposition credibility, ruler willingness, and opposition willingness each hold. Consider a strategy profile in which the ruler shares power in every high-threat period ($\sigma_R = 1$) and the opposition always rejects pure temporary transfers ($\sigma_O = 0$). The relevant deviation to assess is whether the opposition can profit by accepting $(\pi_t, x_t) = (0, 1)$; knowing, because $\sigma_R = 1$, the ruler will offer $(\pi_z, x_z) = (\pi^*, 1 - \pi^*)$ in the next high-threat period z. The pure-strategy equilibrium requires the opposition to prefer a revolt in response to a pure-transfers proposal

$$\underbrace{\frac{\underline{p}(1-\kappa)}{1-\delta}}_{\text{Revolt now}} \geq \underbrace{1 + \delta V_O}_{\text{Wait}}, \tag{16}$$

for

$$V_O = \underbrace{r\frac{\overline{p}(1-\kappa)}{1-\delta}}_{\text{Move to power sharing}} + \underbrace{(1-r)\delta V_O}_{\text{Autocracy persists}}. \tag{17}$$

For the recursively defined opposition's reservation value, Nature draws a high threat in a given period with probability r. At that time, the ruler will share power because $\sigma_R = 1$. Consequently, the opposition's average consumption in each period rises to $\overline{p}(1 - \kappa)$, which is premised on its reservation value to revolting (see Equation 7 with $p = \overline{p}$). With complementary probability, Nature draws a low threat, in which case the opposition consumes 0 in that period and the continuation value resets for the next period.

Combining the previous two equations yields the key inequality for pure-strategy power sharing, denoted as the *weak opposition credibility* condition:

$$1-\delta(1-r)+\gamma \leq \underline{p}(1-\kappa), \quad \text{for} \quad \gamma \equiv \delta r \frac{1-\kappa}{1-\delta} \underbrace{(\overline{p}-\underline{p})}_{\text{Threat-enhancing effect}} . \tag{18}$$

This inequality resembles the form of the (strong) opposition credibility condition (Equation 11), with the addition of a wedge γ on the left-hand side that captures the threat-enhancing effect of power sharing. If sharing power did not reallocate power, $\overline{p}=\underline{p}$, then $\gamma=0$ and this inequality is identical to Equation 11. Thus, Equation 18 would necessarily fail given the present presumption that (strong) opposition credibility holds. This implies that the threat-enhancing effect is necessary for a profitable deviation. Additionally, the magnitude of γ increases in r because this decreases the expected time until the next high-threat period, which makes the opposition more willing to wait for a power-sharing deal. Conversely, at $r=0$, another high-threat period will never occur, which obviates mixing and yields $\gamma=0$.

Proposition 5 (Pure-strategy power sharing)**.** *Suppose (strong) opposition credibility (Equation 11), ruler willingness (Equation 12), opposition willingness (Equation 14), and weak opposition credibility (Equation 18) all hold. The unique equilibrium strategy profile includes $\sigma_R=1$ and $\sigma_O=0$. Along the equilibrium path in high-threat periods, the ruler shares power and conflict does not occur.*

If ruler willingness and opposition willingness hold, and the strong but not the weak version of opposition credibility holds, then the unique equilibrium is in mixed strategies. For the aforementioned reasons, the opposition can profitably deviate from either of the two pure strategies: always accepting a pure transfers proposal (because strong opposition credibility holds), or always rejecting (because weak opposition credibility fails). The ruler calibrates its probability of sharing power in a high-threat period to make the opposition indifferent between accepting and revolting. This pins down a unique mixing probability, denoted $\sigma_R^* \in (0,1)$:

$$\underbrace{\frac{\underline{p}(1-\kappa)}{1-\delta}}_{\text{Revolt}} = \underbrace{1+\delta V_O}_{\text{Wait}}, \tag{19}$$

for

$$V_O = r\Bigg(\underbrace{\sigma_R^* \frac{\overline{p}(1-\kappa)}{1-\delta}}_{\text{Move to power sharing}} + \underbrace{(1-\sigma_R^*)\frac{\underline{p}(1-\kappa)}{1-\delta}}_{\text{Revolt or wait}} \Bigg) + \underbrace{(1-r)\delta V_O}_{\text{Autocracy persists}}. \tag{20}$$

These are similar to the preceding equations, except Equation 19 is an equality (unlike the inequality in Equation 16) and V_O is now a function of a non-degenerate probability σ_R^* (Equation 20) rather than the ruler sharing power with probability 1 in the next high-threat period (Equation 17). Thus, in high-threat periods, there is a $1-\sigma_R^*$ chance that the opposition will again choose between revolting and waiting. Given the opposition's indifference condition, its payoffs are identical regardless of which decision it makes. Lemma 6 summarizes key elements of the function σ_R^*.[29]

Lemma 6 (Properties of mixed power-sharing probability)**.** *Define r^{min} as the value of r that satisfies Equation 18 with equality and r^{max} as the value of r that satisfies Equation 11 with equality.*

- $0 < r^{min} < r^{max} < 1$.
- $\sigma^*(r^{min}) = 1$.
- $\sigma^*(r^{max}) = 0$.
- *For $r \in (r^{min}, r^{max})$, $\sigma^*(r) \in (0,1)$ and $\frac{d\sigma^*}{dr} < 0$.*

Regarding the ruler's calculus, ruler willingness holds, and therefore the ruler strictly prefers to share power rather than to incur a revolt for sure. But, if there is some prospect for the opposition to accept a contemporaneous offer that lacks a power-sharing provision, the ruler may be willing to gamble. The opposition must calibrate its probability of accepting a pure-transfers proposal to make the ruler indifferent between sharing power and not. This pins down a unique mixing

[29] These statements follow from straightforward applications of the intermediate value theorem and the implicit function theorem.

probability, denoted $\sigma_O^* \in (0,1)$:

$$\underbrace{\frac{1-\overline{p}(1-\kappa)}{1-\delta}}_{\text{Share power}} = \underbrace{\overbrace{\sigma_O^* \delta V_R}^{\text{Autocracy persists}} + (1-\sigma_O^*)\overbrace{\frac{(1-\underline{p})(1-\kappa)}{1-\delta}}^{\text{Opposition revolts}}}_{\text{Wait}}, \tag{21}$$

for

$$V_R = \underbrace{(1-r)(1+\delta V_R)}_{\text{Autocracy persists}} + r\underbrace{\frac{1-\overline{p}(1-\kappa)}{1-\delta}}_{\text{Share power or wait}}. \tag{22}$$

The indifference condition equates the ruler's expected utility to sharing power with that to waiting, which requires the opposition to put the correct weight on each of accepting and revolting. The continuation value expresses that autocracy necessarily persists if the next period is low threat, whereas another high-threat period yields the same decision between sharing power and waiting. Given the ruler's indifference condition, his payoffs are identical regardless of which decision he makes.

Proposition 6 (Mixed-strategy power sharing)**.** *Suppose (strong) opposition credibility (Equation 11), ruler willingness (Equation 12), and opposition willingness (Equation 14) all hold; but weak opposition credibility (Equation 18) fails. The unique equilibrium strategy profile includes $\sigma_R = \sigma_R^*$ and $\sigma_O = \sigma_O^*$, defined in Equations 19 through 22. Along the equilibrium path, the probability in high-threat periods that the ruler shares power is σ_R^* and the probability of conflict is $(1-\sigma_R^*)(1-\sigma_O^*)$.*

The existence of a mixed-strategy range in the present model is not obvious, given existing models. Acemoglu and Robinson (2017) demonstrate a range of parameters in which the unique equilibrium is in mixed strategies, which follows from their assumption that the space of institutional reform options is binary. The only possible reform option in their model is full franchise expansion that enables the masses to set policy in every period. This yields strictly more consumption than the masses would gain by revolting against the dictatorship. Castañeda Dower et al. (2020) extend this model to allow for continuous levels of institutional reform. This alteration eliminates the mixed-strategy range because the ruling elites can perfectly tailor the amount of power shared to make the majority indifferent between accepting or revolting.

We might expect that the Castañeda Dower et al. (2020) result would extend to the present model, as the space of power-sharing options is continuous here as well. The key difference, once again, is the threat-enhancing effect. Although the ruler sets $\pi_t = \pi^*$ to make the opposition indifferent between accepting or revolting, this indifference holds for the opposition's probability of winning *after power has shifted in its favor*. But compared to the opposition's baseline, sharing power strictly increases its reservation value. Despite the continuous space of power-sharing options, the present model is more analogous to Acemoglu and Robinson (2017) because sharing power creates a discrete wedge.[30]

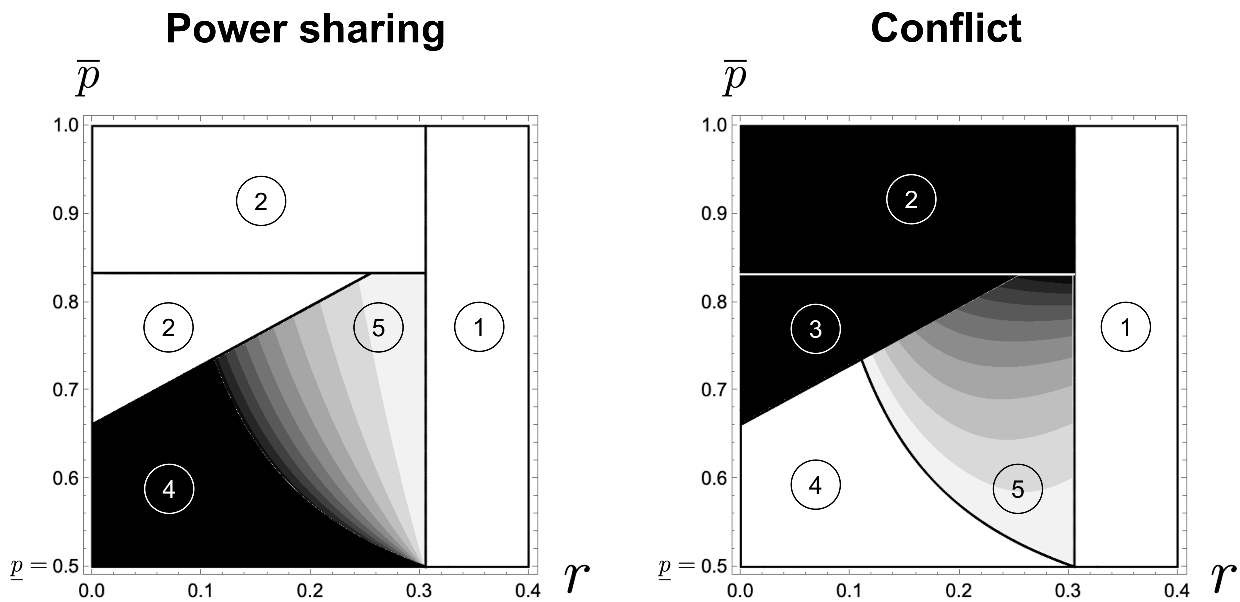
5 Summary and Discussion

Confronting a commitment problem, autocrats frequently share power with the opposition. This paper presents a formal model that incorporates the two core elements of power-sharing arrangements: committing to deliver more spoils to the opposition, and reallocating coercive power toward the opposition. The second element is uncommon in existing formal models and other theories of authoritarian survival, and yields new insights.

Figure 4 summarizes the equilibrium outcomes generated by the different parameter values presented in the preceding propositions. In a generic high-threat period under autocratic rule, the panels depict the probabilities of a power-sharing arrangement taking hold (left panel) and conflict (right panel). White indicates probability 0, black indicates probability 1, and gray indicates interior probabilities (with darker colors indicating a higher probability).

[30]This result is not an artifact of the assumed discrete functional form for $p(\pi)$. Even if $p(\pi)$ was smooth (see footnote 19), sharing power would raise the opposition's reservation value compared to under autocracy. This is the necessary wedge for the mixed-strategy range. For a related discussion of mixed strategies in dynamic models of conflict, see Gibilisco (2023).

Figure 4: Equilibrium Power Sharing and Conflict



Parameter values: $\delta = 0.9$, $\kappa = 0.25$, $\underline{p} = 0.5$, $\pi^{\min} = \pi^{\max} = 0.44$.

In the pure-strategy power-sharing region (4), the ruler shares power with probability 1. For the given parameter values, this region exists only for low enough $\overline{p}$, as higher values violate opposition willingness.[31] Additionally, for all parameter values, pure-strategy power sharing requires low enough r. Less frequent high-threat periods raise the credibility of the opposition's threat to rebel, thus satisfying the weak opposition credibility condition. Larger values of r move the equilibrium into the mixed range (5). Here, the probability of power sharing (σ_R^*) strictly decreases in r. Lower probabilities of power sharing satisfy the opposition's indifference condition as r increases because the opposition's shadow of the future under autocratic rule improves. Outside these regions, the ruler shares power with probability 0: if opposition credibility fails (1), ruler willingness fails (2), and/or opposition willingness fails (3).

Comparing the conflict panel with the power-sharing panel shows that the two usually move in opposite directions. If ruler willingness or opposition willingness fail, the ruler never shares power

[31]The parameter values in Figure 4 correspond with the case in Figure 3 in which offensive capabilities dominate (green line); more generally, see Part a of Lemma 4.

and conflict occurs with probability 1 in a high-threat period. In the pure-strategy power-sharing range, high-threat periods prompt power sharing but not conflict. Within the mixed range, areas with a lower probability of sharing power, σ_R^*, have a higher probability of conflict, $(1-\sigma_R^*)(1-\sigma_O^*)$. Only in the region in which opposition credibility fails is peace compatible with persistent autocracy.

These results differ substantially from those in related models that provide the core modeling technology used here. Each of Acemoglu and Robinson (2000, 2001, 2006, 2017), Castañeda Dower et al. (2018, 2020), and Powell (2023) expect power sharing to occur under broader circumstances because none of these models include a threat-enhancing effect. In all, an analog to the strong opposition credibility condition is necessary to induce power sharing. However, none have an analog to the ruler willingness condition; the opposition's probability of winning is fixed at 1, which ensures that ruler willingness holds.[32] And all but Powell (2023) lack an analog to the opposition willingness condition. In Powell, very weak institutions imply a high equilibrium probability that the ruler will block the implementation of promised institutional concessions, which makes it impossible for the ruler and opposition to strike a deal. However, his model isolates only why *weak institutions* can obviate opposition willingness, whereas here I additionally explain the countervailing effects of the *opposition's coercive capabilities*, in particular offensive versus defensive consequences. Finally, existing models admit mixed-strategy equilibria only if the power-sharing choice is discrete (Acemoglu and Robinson 2017), whereas a continuous strategy space ensures pure strategies (Castañeda Dower et al. 2020). However, as shown here, mixed strategies are compatible with a continuous power-sharing choice if sharing power generates a threat-enhancing effect. This highlights yet another reason that power sharing may fail to occur in equilibrium.

How to divide political power is among the most consequential choices that any regime faces. Sharing power affects not only the institutional allocation of power, but also the distribution of coercive power. Understanding these consequences is crucial for understanding the design of political

[32] Little and Paine (2023) discuss this aspect of these models in more depth.

regimes and their survival prospects.

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