BRIBERY'S ROLE IN SECURING LOYALTY: ANALYZING INNER CIRCLE DYNAMICS THROUGH GLOBAL GAMES

A Master's Thesis

by
AYBÜKE DERE

Department of
Economics
İhsan Doğramacı Bilkent University
Ankara
July 2024

To my dearest brother...

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AYBÜKE DERE

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İHSAN DOĞRAMACI BİLKENT UNIVERSITY
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By Aybüke Dere

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

_____
Ahmet Arda Gitmez
Advisor

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

_____
Nuh Aygün Dalkıran
Examining Committee Member

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

_____
Emre Ekinci
Examining Committee Member

Approval of the Graduate School of Economics and Social Sciences

_____
Refet S. Gürkaynak
Director

ABSTRACT

BRIBERY'S ROLE IN SECURING LOYALTY

Dere, Aybüke

M.A., Department of Economics

Advisor: Asst. Prof. Ahmet Arda Gitmez

July 2024

This thesis examines how autocratic regimes construct their inner circles through bribery and oppression, while the inner circle decides whether to remain loyal or revolt against the regime. We show that there exists a unique rationalizable action in which the probability of the autocrat's survival increases with the cost of revolt and the share of loyalists within the inner circle, and decreases with the benefits of a successful revolt. To support our theory, we present empirical evidence showing that an increase in the resources of the regime, proxied by the price of oil in autocracies, leads to an increase in the size of support groups, while a larger support group size is associated with a decrease in the number of successful revolts.

Keywords: Global Games, Regime Change, Bribery, Oppression

ÖZET

SADAKATİN GÜVENCE ALTINA ALINMASINDA RÜŞVETİN ROLÜ

Dere, Aybüke

Yüksek Lisans, İktisat Bölümü

Tez Danışmanı: Dr. Öğr. Üyesi Ahmet Arda Gitmez

Temmuz 2024

Bu tez, otokratik rejimlerin iç çevrelerini rüşvet ve baskı yoluyla nasıl oluşturduklarını ve iç çevrenin rejime sadık kalma veya isyan etme kararını nasıl verdiğini incelemektedir. Otokratın hayatta kalma olasılığının; isyan maliyeti ve iç çevredeki sadıkların oranı arttıkça arttığını ve başarılı bir isyanın getirdiği faydalar arttıkça azaldığını gösteren bir dengenin varlığını kanıtlıyoruz. Teorimizi desteklemek için, otokrasilerde petrol fiyatı ile ölçülen rejim kaynaklarındaki bir artışın destek gruplarının büyüklüğünde bir artışla ilişkili olduğunu ve daha büyük bir destek grubu büyüklüğünün başarılı isyanların sayısında bir azalmayla ilişkili olduğunu gösteren istatistiksel kanıtlar sunuyoruz.

Anahtar sözcükler: Global Oyunlar, Rejim Değişikliği, Rüşvet, Baskı

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CHAPTER 1

INTRODUCTION

Although democratic governance has become widespread recently, dictatorship remains an easier way for most regimes to maintain power and sustain governance (Boix & Svolik, 2013). However, dictatorships are also frequently under specific threats. For most dictators, maintaining power is more challenging than acquiring it, and they often find themselves trying to fend off threats. These threats can come from external sources or from within, possibly an uprising by their most trusted group. In such cases, a dictator who feels weak and vulnerable to threats from his inner circle will try to surround himself with loyal people. By giving benefits to those left out and higher payments to a few included members, a majority can always be formed against any redistribution plan (Tullock, 1987). The same applies to dictators. To keep loyal people in their inner circle, they will need to use repression and bribery. People in the inner circle who pledge allegiance to the leader are often incompetent because competent people recognize the correct actions and, seeing the leader's poor performance, will not remain loyal (De Mesquita & Smith, 2011). Although this situation is not expected to last forever, dictators can maintain loyalty in their inner circle for a certain period by applying coercion and/or offering bribes, thus protecting themselves from internal threats after their early years (Domínguez, 2002). However, one of the main reasons

this cannot continue indefinitely is that people who are kept loyal through bribery and coercion tend to be ineffective and unable to perform adequately for the country's welfare. This leads to an incompetent inner circle and, consequently, a vulnerable dictator. Thus, when a leader fills his inner circle with a high number of loyalists, the economy suffers due to the government's low performance, leading to the leader not being re-elected. Such a scenario is likely to incite a popular uprising. Conversely, if the leader includes highly competent people in his inner circle, he faces the risk of revolt (Svolik, 2012).

Even though an autocratic leader may establish a merit-based inner circle based on performance in the early years after being elected, over time, the rise of disloyal elements can lead the leader to resort to bribery to suppress the situation. As the loyalists within the inner circle, who were placed there through bribery, prove to be ineffective in terms of performance, the leader's initial performance eventually deteriorates. To maintain popular support, the leader needs to establish a balance within the inner circle. However, bribery and pressure do not guarantee the loyalty of these bureaucrats. If a bureaucrat both receives bribes and realizes that the regime is weak, it is inevitable that they will rebel, seeing greater benefits in doing so. Therefore, an autocrat is threatened either by the potential disloyalty from his close circle or by a public uprising resulting from the failures of a loyal but incompetent inner circle. In this case, he is obliged to make a choice to protect himself against these two threats. By determining whether the threat arising from a public uprising or the bureaucrats' uprising is more dangerous, he will use the resources of the regime to ensure the loyalty of his inner circle through bribery and pressure, even if their loyalty is not guaranteed.

This paper explores an important inquiry: How do leaders strategically manipulate loyalty through tactics like bribery and oppression? The heart of the struggle lies in

the critical dilemma faced by the inner circle: a coordination problem where members of the inner circle decide whether to remain loyal or revolt against the autocratic leader. This decision-making process shapes the fate of regimes.

To determine the optimal strategy for addressing the coordination problem, we utilize the machinery of global games (Carlsson & Van Damme, 1993; Morris & Shin, 2003). For a concrete understanding, consider the following example: an autocratic leader gives bribes to a portion of his inner circle in an attempt to make them loyal. There becomes two types of bureaucrats in an inner circle, loyal and disloyal. Both loyal and disloyal bureaucrats decide simultaneously whether to revolt or not after taking the bribe. These bureaucrats face a coordination problem since they do not know how the other bureaucrats will behave. Each observes a noisy private signal about the regime's strength and then makes a final decision.

If the agents in the inner circle perceive the regime's strength as insufficient to suppress their uprising and believe that others also see it this way, a revolt will occur. Conversely, if a sufficiently strong regime is observed, no uprising will happen. Therefore, there exists a threshold where any signal observed below this threshold leads to a consensus against starting a revolt, while any signal above this threshold leads to a consensus for starting a revolt. This signifies the presence of an equilibrium.

In this study, we investigate the impact of the overall resource availability of the autocrat on determining the proportion of loyal people in the inner circle, and how this proportion of loyal people in the inner circle affects the likelihood of a potential uprising. By further investigation, we examine whether different cost settings for loyal and disloyal members change the optimal strategy of the inner circle. This change in the

model sheds light on our previous concerns that bribery and coercion may not be effective in ensuring the loyalty of bureaucrats. Evaluating the model through different cost structures will examine the decisions of bureaucrats, who, despite being made loyal through bribery, may consider that rebelling against the regime could be beneficial for them.

Finally, we test whether the results of our theoretical model hold in real life through an empirical analysis. In this analysis, we use the log oil price per capita, a plausibly exogenous parameter that proxies the resources available to autocracies, as the source of the autocrat's resources. We also use the total number of coup attempts in a year to represent the probability of a revolt against the regime, and the size of regime support groups to represent the share of loyalists in the inner circle.

Our empirical analysis shows that increases in log oil price per capita significantly increase the size of support groups for autocratic regimes, such as party elites, business elites, state bureaucracy, and the military. The OLS and 2SLS estimations show that larger support groups among state bureaucrats correlate with a reduced likelihood of revolt, whereas the relationship for party elites is more complex, with mixed results that suggest potential rivalries. Additionally, our findings consistently indicate that larger support groups among business elites and the military generally decrease the occurrence of revolts, reinforcing our theoretical expectations.

The rest of the chapters are organized as follows: Chapter 2 presents the literature review. Chapter 3 outlines the theoretical model, necessary assumptions, and analytical results and discussions. Chapter 4 provides empirical evidence for our theoretical model, including robustness checks. Chapter 5 offers further discussions on the results and suggests possible future research areas. Finally, Chapter 6 concludes the thesis.

CHAPTER 2

LITERATURE REVIEW

In real-life settings, common knowledge is often absent. This indeterminacy necessitates tracking people's beliefs within models. The study of incomplete information and the formation of coordination and collective action has become a key area in contemporary political research. Harsanyi (1967)'s work on agents' beliefs depending on other people's beliefs, forming higher-order beliefs, laid the foundation for this field. Later, Mertens and Zamir (1985) and Brandenburger and Dekel (1993) expanded on this by describing a "type" of player in incomplete information games with higher-order beliefs, which are fundamental to the current study.

Given that higher-order beliefs are inherently intractable, Carlsson and Van Damme (1993) and Morris and Shin (2003) developed the Global Games framework to refine equilibria in coordination problems. In such settings, each agent observes the state of nature through a noisy private signal. This framework has been instrumental in understanding currency attacks, bankruptcies, bank runs, and revolts (Edmond, 2013; Morris & Shin, 2004).

In a regime, each member of an autocrat's inner circle receives a private signal about

the regime's strength. If the regime is perceived as strong enough to repel a revolution and this strength is recognized by the inner circle, they will coordinate on not revolting. Conversely, if the regime is perceived as weak and coordination among the inner circle can successfully overthrow the leader, the bureaucrats will coordinate to revolt. The study of collective action and the factors driving mass participation in protests remains a pivotal area in contemporary political research. Early models proposed by Acemoglu and Robinson (2001, 2006) laid the groundwork for understanding how dissidents coordinate protests, emphasizing the hurdles involved in collective action coordination. Building upon this, subsequent research exemplified by Shadmehr and Bernhardt (2011) indicated that restricting public information increases the likelihood of protests.

In the context of protest dynamics, Shadmehr (2019) presented a model utilizing the global game approach and connected the likelihood of regime change to the fraction of revolters, all of whom receive private noisy signals about regime strength. The idea of the fraction of loyalists used in the analytical model of our thesis and the concept of differentiating loyalists and disloyalists by the opportunity cost of revolting were inspired by Shadmehr (2019). Similar models by Barbera and Jackson (2019), Egorov and Sonin (2020), and Morris and Shadmehr (2023) have been applied to understand revolutions and the impact of media freedom on shaping protest possibilities in various political landscapes.

Another critical aspect contributing to the understanding of collective action dynamics resides in research on the interplay between loyalty and competence within inner circles of autocratic governance. An autocrat faces the dilemma of selecting an inner circle from a spectrum of loyal but potentially incompetent individuals to those who are competent but likely to revolt (Svolik, 2012). Gregory (2003) and Montefiore (2010)

studied Stalin's selection of his inner circle using archival evidence. They describe the 'selfish' dictator as one who strategically gives gifts to secure political loyalty, often choosing mediocre individuals out of fear of betrayal. This phenomenon is not unique to Stalin's Soviet Russia but is also seen in leaders like Hitler in Germany, Ceausescu in Romania, and even in contemporary autocrats (Egorov & Sonin, 2011).

Egorov and Sonin (2011) developed a principal-agent model between a dictator and a vizier to illustrate how a dictator might choose a loyal vizier despite the risk of poor performance due to the fear of betrayal. Sakovics and Steiner (2012) used the Laplacian property of Morris and Shin (2003) to come up with the idea of constructing the belief constraint. Additionally, Edmond (2013) introduced the concept of costly technology used for jamming signals, adding complexity to inner circle dynamics and the control mechanisms employed within autocratic regimes.

Expanding beyond theoretical frameworks, studies by Barbera and Jackson (2019), Kuran (1987), Lohmann (1994), and Zhuravskaya et al. (2020) examine involvement in costly political actions such as revolts, shedding light on the necessity of protests preceding revolutions and the role of social media in anti-government protests. These studies show that social media facilitates the coordination of protests and popular uprisings. It is possible to evaluate the signals used in the global games literature in this sense. As mentioned by Casper and Tyson (2014) and Wintrobe (2000), public uprisings might help the elites discussed in our model to receive accurate signals about the strength of the regime. The way the regime suppresses public uprisings provides a lot of information about the regime. The repression and bribery we mentioned can also distort this signal (Gehlbach et al., 2024; Wintrobe, 1990).

There is an emerging literature that examines regime durability through the loyalty of

the inner circle and the resources at the leader's disposal, and conducts empirical studies on this topic. Egorov et al. (2009) concludes that media are less free in oil-rich economies in non-democratic countries. The strong relationship between dictatorship regimes and the possession of natural resources has been studied for a long time, and as Ross (2001) states, natural resources are used as bribes by political leaders. Based on these findings, it can be expected that rent-giving is more prevalent in autocracies, particularly in oil-rich countries, leading to an increase in loyal support groups for the leader. Additionally, B. Smith (2004) shows a link between countries with oil production and increased regime durability using panel data. Mesquita et al. (2003), A. Smith (2008), and Wantchekon (2002) also find a relationship between regimes governed by dictatorships and the possession of natural resources. From these studies, we aim to demonstrate that as oil production increases in autocratic regimes, the proportion of the loyal group within the inner circle increases, thereby reducing the probability of coup attempts.

In our analytical model, it is possible to see the elites mentioned in our assumptions in four different groups in real life. These are party elites, business elites, state bureaucracy, and the military. However, we need to investigate which of these will be supported by our analytical model in our empirical study. When we review the literature, we encounter the following situations individually.

Authoritarian leaders need party elites to come to power and govern the country (Kricheli & Livne, 2011). However, with this need, party elites gradually become powerful in the administration. This increasing power poses a threat to the leader, as these party elites have the power not only to bring the leader to power but also to remove them from office (Chin et al., 2022; Geddes, 2008; Svolik, 2009). However, at the heart of the problem, we see that this leads to a selection problem. It is not

a common occurrence in history for any autocratic leader to come to power without the support of party elites. Since the leaders are already supported by the party elites, they gain power. At the same time, party elites benefit significantly from the regime being managed by the leader they support. Therefore, there is a significant difference between the opposition and the ruling party. We believe that this group does not fully align with our model.

Unless business elites are involved in politics, it is important for the regime to perform well for the companies and bodies they manage. Due to the more complex dynamics involved for this group, we cannot say that it fits our model. The military possesses characteristics that are distinctly different from the other two groups we discussed and should be evaluated separately from them. The military stands out with its discipline, authoritarian structure, and the way it utilizes power. The professional use of force by this group is more prominently seen in areas of human rights violations and repression in countries where the military is dominant (Geddes et al., 2014). Additionally, as discussed by Ross (2001), as oil wealth increases, military spending also significantly rises, which in turn is associated with authoritarianism. The military's closer proximity to the regime, its greater concentration of power, and its ability to wield this power for any junta, make it possible for global game dynamics to be different. Due to the reasons we mentioned, state bureaucrats appear to be the most suitable support group for our model.

This diverse body of research not only deepens the understanding of collective action, protest dynamics, and autocratic governance but also sheds light on how bribes and repression used by autocrats alter these dynamics. Understanding the complexity of these dynamics will be beneficial in comprehending the effects and influences of bribery and repression examined in our model. Moreover, this understanding can help

us develop more accurate predictions about the outcomes of such strategies in different political contexts, providing a more detailed view of autocratic stability and resilience.

CHAPTER 3

THE MODEL

Consider an autocratic regime consisting of an autocrat and a continuum of bureaucrats, also referred to interchangeably as the *inner circle*. The autocrat faces the problem of choosing the optimal fraction of loyalists among the bureaucrats in his inner circle. He aims to find an optimal share of loyalists such that the economy does not suffer from poor performance while ensuring that the risk of revolt remains low enough for him to stay in power. The autocrat tries to prevent the bureaucrats from revolting by giving bribes to a certain fraction of his inner circle. However, bribes alone do not ensure that the bureaucrats will not revolt against the autocrat. Each bureaucrat receives a private signal about the regime's strength. Thus, they will not know who will revolt and who will not. However, by observing the signal, they will determine that if the regime is seen as strong enough, there will not be a consensus on revolting against the autocrat. If the regime is seen as weak enough, the bureaucrats will take action to revolt against the regime. This threshold will be determined by the loyalty share of the inner circle, the benefit gained by a successful revolt against the regime, and the cost of revolting.

3.1 Setup

There are two types of agents: the autocrat and a continuum of bureaucrats $N = [0,1]$. The autocrat possesses total resources $Y \in \mathbb{R}^+$ and makes two critical decisions. First, he selects $\alpha \in [0,1]$, representing the fraction of loyalists in the inner circle. This selection incurs a cost $K(\alpha)$, which is an increasing and convex function of α. Second, the autocrat decides whether to accept the additional bribe r requested by the bureaucrats in the inner circle.

The timing of the game follows the sequence of steps:

1. **Autocrats' Selection of Fraction of Loyalists in the Inner Circle**
The autocrat selects a loyalty fraction α, which incurs a cost $K(\alpha)$. After choosing the fraction of loyalists in the inner circle, the autocrat is left with the remaining resources $Y - K(\alpha)$. Therefore, $K(\alpha)$ lies within the interval $[0, Y]$.

2. **Bureaucrats' Requests and Decisions**
The inner circle bureaucrats request an additional bribe, $r \in [0, Y - K(\alpha)]$. An ultimatum bargaining game is played between the bureaucrats and the autocrat. If the autocrat accepts the request for an additional bribe, the bureaucrats receive the requested additional bribe r, and the autocrat's resources decrease to $Y - K(\alpha) - r$. If the autocrat rejects the requested bribe, the scenario proceeds to a regime change game: if the autocrat survives, his resources remain $Y - K(\alpha)$; if the autocrat does not survive, he loses all his resources, ending with 0.

This framework outlines the strategic decisions where the autocrat balances the cost of ensuring inner circle loyalty against potential resource requests from bureaucrats. The

autocrat's choices and responses influence the stability of the regime and determine resource preservation.

Ultimatum Bargaining Game The figure illustrates an ultimatum bargaining game between the autocrat and the bureaucrats within the inner circle. Here, the first number is the payoff of the bureaucrat and the second number is the payoff of the autocrat.

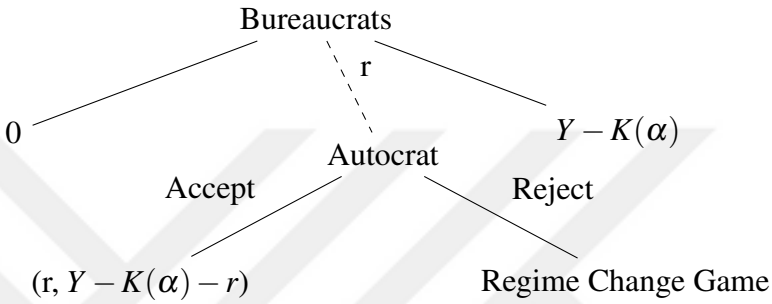

Figure 3.1: Ultimatum Bargaining Game

The ultimatum bargaining game originated by Ståhl (1972) allows us to evaluate different perspectives of both bureaucrats and the autocrat.

To ensure the loyalty of bureaucrats, it is necessary to provide the bribes the inner circle demanded. Therefore, if the bureaucrats are given an insufficient bribe, they should be able to act as the proposer and demand more. If their demands are not met, the global game by Carlsson and Van Damme (1993), which we call the regime change game, is played. Using the ultimatum bargaining game grants the bureaucrats the authority of the proposer, thereby giving them the power to obtain what they want and, if they fail, the power to threaten the autocrat with rebellion. The inclusion of the ultimatum bargaining game in our model creates a disincentive for the autocrat to offer low bribes. However, even if the ultimatum bargaining game were not present, knowing that the regime change game would be played indicates that the loyalty obtained through bribery is not permanent.

Regime Change Game We will examine a global game in which revolting or not depends on the bureaucrats' beliefs about the regime's strength (Boleslavsky et al., 2021).

3.2 Absolute Loyalty

The payoffs are as in the following table, where c_i represents the cost associated with revolting. Notably, $c_i > b$ if an individual is loyal, while it is within the range of $0 < c_i < b$ if not loyal. This means not participating is a dominant strategy for loyalists. Here, b denotes the benefit obtained from a successful revolt. The higher cost incurred by loyalists can be intuitively understood, perhaps as facing imprisonment or forfeiting benefits, reinforcing the rationale behind the different cost structures. This assumption that loyalists do not revolt due to their higher costs compared to disloyalists will be weakened in the next sections.

	$m \geq \theta$	$m < \theta$
Participate	$b - c_i$	$-c_i$
Not participate	0	0

Table 3.1: Regime Change Game

The autocrat chooses a fraction of the inner circle to be given bribes, attempting to make them loyal to himself without knowing any prior information about the bureaucrats. This continuum of bureaucrats constructs a measure m. The autocrat's strength $\theta \sim U[0,1]$. Each bureaucrat i simultaneously chooses an action $a_i \in \{0,1\}$, where $a_i = 1$ corresponds to participating in revolts. Her payoff from playing action 0, not participating in revolts, is normalized to zero. There are two regimes: status quo, and

a new regime. If the measure m of the inner circle who plays participate exceeds the regime strength, $m \geq \theta$, a regime change ensues, indicating that the strength of the revolters exceeds that of the regime. Otherwise, if $m < \theta$, the status quo persists since the regime's strength is greater than that of the revolters.

In the spirit of global games, we assume that the bureaucrats do not observe the realization of θ, but observe a private signal of θ. They share a common prior that $\theta \sim U[\underline{\theta}, \overline{\theta}]$, where $\underline{\theta} < 0 < 1 < \overline{\theta}$. We will consider the limit case where $\underline{\theta} \to 0$ and $\overline{\theta} \to 1$. In scenarios of complete information where the regime strength θ is known, the outcome is deterministic (Egorov & Sonin, 2020). Now, suppose that bureaucrats do not know θ, but observe a noisy private signal $x_i = \theta + \sigma\varepsilon_i$. Here, the noise terms are independently drawn from the same distribution, denoted as F. $\sigma \in (0,1]$ scales the random error ε_i (Sakovics & Steiner, 2012). ε_i is iid across the bureaucrats and is independent of the realization of θ.

Proposition 1 *In a game of regime change, assuming that noises are bounded, for any threshold x_i^*, $x_i \neq x_i^*$, there exists a unique rationalizable action where the strategy is*

$$s_i^*(x_i) = \begin{cases} 0 & \text{if } x_i > x_i^* \\ 1 & \text{if } x_i < x_i^* \end{cases}$$

As $\sigma \to 0$, all thresholds x_i^* converge to a common limit θ^*, where $\theta^* = 1 - \frac{c}{b(1-\alpha)}$.

Proof. Proof is in the Appendix.

The result of Proposition 1 means that when the noise vanishes and each bureaucrat starts receiving the exact signal about the regime strength θ, they coordinate on revolting whenever $\theta_i > \theta^*$ and coordinate on not revolting whenever $\theta_i < \theta^*$. Subsequently,

a couple of intuitive comparative statics emerge due to the supermodular structure. Firstly, an increase in the benefit derived from a successful revolt prompts more bureaucrats to engage in the regime change game, consequently elevating the probability of a successful revolt. Conversely, a higher cost associated with revolting diminishes the participation of bureaucrats in revolts, thereby increasing the probability of the autocrat's survival. Finally, a higher fraction of loyalists within the autocrat's inner circle chosen by the autocrat directly correlates with a higher likelihood of regime survival.

Corollary 1 *There will be a successful revolt whenever $\theta < \theta^*$, and there will not be a successful revolt whenever $\theta > \theta^*$. Therefore, the probability that the Autocrat survives, $P(\text{Autocrat survives}) = P(\theta > \theta^*)$ is equal to $\frac{c}{b(1-\alpha)}$.*

Corollary 1 suggests a very intuitive comparative statics exercise.

Proposition 2 *The probability that the autocrat survives is increasing in α.*

Through this proposition, we derive our first Testable Prediction which we will test later.

Testable Prediction 1 An increase in the fraction of loyalists in the inner circle, α, is associated with a higher likelihood that the regime survives.

We now move on to the analysis of the ultimatum bargaining game.

Proposition 3 *There is a unique equilibrium of the Ultimatum Bargaining Game. In the unique equilibrium, the bureaucrats ask for r^* where, $r^* = (1 - \frac{c}{b(1-\alpha)})(Y - K(\alpha))$, and the autocrat accepts. Autocrat's final payoff is $\Phi(\alpha) = Y - K(\alpha) - (1 - \frac{c}{b(1-\alpha)})(Y - K(\alpha))$.*

Proposition 2 establishes the optimal additional bribe requested by the bureaucrats to make the autocrat indifferent between accepting the requested bribe and proceeding with the regime change game. We find that this additional bribe, r, decreases with the cost of revolting, increases with the benefit of regime change, decreases with α, increases with the autocrat's total resources, and decreases with the total cost of bribes given by the autocrat in the first stage. The probability of the autocrat's survival increases with the cost of revolt, decreases with the benefit of regime change, and increases with the loyalty share within the inner circle.

Let $\Phi(\alpha)$ be the autocrat's final payoff, defined as $\Phi(\alpha) = Y - K(\alpha) - \left(1 - \frac{c}{b(1-\alpha)}\right)(Y - K(\alpha))$. $\Phi(\alpha)$ represents various factors affecting the autocrat's decisions regarding the optimal loyalty fraction in his inner circle, which maximizes the total resources of the regime and ensures the autocrat's survival.

$$\max_{\alpha \in [0,1]} Y - K(\alpha) - (1 - \tfrac{c}{b(1-\alpha)})(Y - K(\alpha))$$

where $K(\alpha)$ is increasing and convex. Let α^* denote the outcome of this maximization problem. In the next section, we study how α^* varies with the parameters of the model. We will use these comparative statics exercises to obtain some comparative statics.

3.2.1 Comparative Statics with Respect to Inner Circle Loyalty

We now study how α^* is affected by changes in our parameters by applying the monotone comparative statics (Milgrom & Shannon, 1994).

Proposition 4 *α^* is increasing in Y.*

Proof. Proof is in the Appendix.

The positive sign implies that as α increases, the influence of Y on $\Phi(\alpha)$ increases at an accelerating rate. In other words, a higher loyalty share within the inner circle significantly increases the sensitivity of $\Phi(\alpha)$ to changes in the autocrat's total resources. Therefore, we have the following testable prediction:

Testable Prediction 2 The share of loyalists, α^*, is increasing in the total resources available to the autocrat, Y.

We can also derive comparative statics on how α^* changes with b.

Proposition 5 *α^* is increasing in b when $K'(\alpha)(1-\alpha) > Y - K(\alpha)$, and α^* is decreasing in b when $K'(\alpha)(1-\alpha) < Y - K(\alpha)$.*

Proof: Proof is in the Appendix.

When $K'(\alpha)(1-\alpha) > Y - K(\alpha)$, it means that the incremental cost of increasing loyalty is substantial relative to the remaining resources of the autocrat. In this case, the numerator is positive, leading to a positive cross derivative, which indicates that as the loyalty share α increases, the rate of change of $\Phi(\alpha)$ with respect to b also increases. This scenario suggests that the autocrat, already under significant financial strain, finds it increasingly difficult to manage additional loyalty costs, thereby making the benefits of overthrowing more impactful. Conversely, if $K'(\alpha)(1-\alpha) < Y - K(\alpha)$, it implies that the existing bribing costs are high compared to the autocrat's resources, but the incremental costs are relatively low. This results in a negative second partial derivative, meaning that as α increases, the rate of change of $\Phi(\alpha)$ with respect to b decreases. Here, the autocrat's heavy reliance on existing bribes makes them less

sensitive to further loyalty demands, reducing the influence of the benefits of regime change.

3.3 Conditional Loyalty

In this section, we will examine a different payoff structure for the inner circle. Previously, it was assumed that $c_i > b$ if an individual is loyal, while $0 < c_i < b$ if not loyal. Now, we consider a new structure where $0 < \underline{c} < \overline{c} < b$, with $\overline{c}$ representing the cost for loyal bureaucrats and $\underline{c}$ representing the cost for disloyal bureaucrats.

Under this new structure, loyal bureaucrats incur a higher cost ($\overline{c}$) compared to disloyal bureaucrats ($\underline{c}$). The rationale behind this differentiation can be attributed to the increased risks and penalties faced by loyalists when participating in a revolt. In contrast, disloyal bureaucrats face lower costs, making them more inclined to join the revolution. However, this new structure still allows for the possibility that loyal bureaucrats may become involved in revolts. Thus, these changes suggest that it is not guaranteed for autocrats to secure loyalty through bribes and oppression, making the model more realistic. We will explore the implications of this new payoff structure and how it influences the overall dynamics of revolts.

	$m \geq \theta$	$m < \theta$
Participate	$b - \overline{c_i}$	$-\overline{c_i}$
Not participate	0	0

	$m \geq \theta$	$m < \theta$
Participate	$b - \underline{c_i}$	$-\underline{c_i}$
Not participate	0	0

Table 3.2: Left Panel: Regime Change Game for Loyal Bureaucrats
Right Panel:Regime Change Game for Disloyal Bureaucrats

θ_L^* is the threshold for the loyalists: below this threshold, a successful revolt occurs, and above it, the status quo continues. Similarly, θ_H^* is the threshold for the disloyalists: below this threshold, a successful revolt occurs, and above it, the status quo continues.

Proposition 6 *There cannot be two different signal thresholds θ_L^* and θ_H^*, where a successful revolt occurs for loyalists whenever $\theta < \theta_L^*$ and for disloyalists whenever $\theta < \theta_H^*$.*

Proof. Proof is in the Appendix.

Proposition 6 establishes an important result. In the context of the model, suppose we have: $x_L^* < x_i < x_H^*$. The signals received by the bureaucrats can be interpreted as follows. When x_i is between x_L^* and x_H^*, disloyals believe that the regime is powerful enough to deter revolts, thus agreeing not to revolt. This consensus stems from the perception that the regime's strength (θ) is high enough to make revolting too costly or unlikely to succeed. Conversely, disloyals also believe they can overthrow the leader without the need for the loyals' support. This implies that they perceive the regime as weak enough that a successful revolt is possible without broader support.

This situation creates a paradox: If disloyals are confident in overthrowing the leader on their own, why would loyals not join a revolt they believe will succeed? This contradiction suggests that the loyals, observing the disloyals' signals and behavior, might revise their own perceptions about the regime's strength. In a scenario where one group perceives the regime as strong and the other as weak, those who perceive it as strong (loyals) will likely re-evaluate their stance upon seeing the disloyals' confidence. This dynamic interaction ensures that there can't be two distinctly different thresholds for regime strength perception.

Now, let's examine the other two cases: In the case where $x_i < x_L^* < x_H^*$, both groups within the inner circle believe that they can successfully revolt. In this scenario, we can say that both groups will revolt. In the case where $x_L^* < x_H^* < x_i$, both groups foresee that the revolt will fail. For this situation, we can say that neither group will revolt, and the autocrat will continue to govern the regime.

Examining these three situations and proving that different signal thresholds cannot exist makes us question whether it is possible to construct our model through other assumptions. One possible assumption in this situation could be that both groups have the same cost structure, and this is higher than the benefit of a successful revolt. However, this does not lead us to an interesting result. The reason is that the model moves away from the dynamics where we examine bribery and remains solely dependent on the cost of revolt and the benefit of a successful revolt, failing to create a loyal inner circle. Another way forward in this situation could be to increase the cost by choosing repression instead of bribery or to internalize the cost as increasing in bribe by perceiving bribery as an opportunity cost. However, we do not believe that these would yield more impressive results than the model we have already established.

3.4 Model Results

We derive the following conclusions from our model. Firstly, in the model we developed with the Absolute Loyalty assumption, we consider the cost to a bribed, loyal inner circle from a potential uprising to be higher than the benefit of overthrowing the regime. This high cost can be attributed to the potential loss of any bribes they would receive from a possible autocrat, the mistrust they would garner from not remaining

loyal after accepting bribes from the autocrat, and potential prison sentences. Similarly, we can rationalize that a bureaucrat who does not accept bribes would find the cost lower than the benefit of overthrowing the autocrat due to their meritocratic behavior, ending the bribery environment, and the high benefits of being more competent and meritocratic.

The conclusion we reach under the Absolute Loyalty condition shows that the autocrat's ability to maintain their regime depends on increasing this cost through repression, imprisonment, fear, and restrictions, reducing the benefit people would gain from a potential uprising, and the proportion of loyal people in their inner circle that they would form over the years, even if not in their first years. This explains the cycle that authoritarian regimes enter, where ending repression and bribery would be fatal to the regime itself. It emphasizes the necessity for an autocrat who has started a regime of oppression and bribery to continuously increase these measures. However, due to bounded natural resources, this behavior leads to the increasing impoverishment of their people.

Furthermore, this model elucidates the inherent instability in autocratic regimes that rely heavily on bribery and repression. As the autocrat increases these measures, they create a society where the cost of loyalty becomes extremely high, leading to a balance where any slight miscalculation or decrease in the resources available for bribes can trigger unrest. Over time, this creates a self-reinforcing cycle where the regime's survival is increasingly dependent on heightened levels of repression and bribery, further alienating the population and exacerbating economic hardships. The Absolute Loyalty assumption provides a framework for understanding why autocratic regimes often spiral into deeper cycles of oppression and why dismantling such a regime can be extremely challenging.

In the model we developed with the Conditional Loyalty assumption, we allow all bureaucrats to participate in the revolt. Even though we consider the cost for bureaucrats who have been made loyal through bribery to be higher than for other bureaucrats, the benefit they would gain from overthrowing the autocrat is above the cost for all bureaucrats. Therefore, a successful revolt is desired by both groups. However, in this situation, we encounter two different signal thresholds. As we demonstrated in Proposition 6, having two different thresholds is not possible. We interpret this as follows:

Let's assume that both loyal and disloyal groups form two different signal thresholds. This means that an equilibrium where the disloyals revolt while the loyals remain loyal is possible. However, we know that a successful revolt is the desired outcome for both groups because the benefit for each group is higher than the cost. In this case, it is not optimal for the loyals not to join when the disloyals understand that they can overthrow the regime with only their participation. There is no equilibrium where only the loyals participate because any signal that surpasses the threshold for the loyals will also surpass the threshold for the disloyals. From this, we conclude that our Conditional Loyalty assumption, although it seems reasonable at first, results in the non-existence of two different signal thresholds in the global games literature. Another assumption we could make is that the benefit for both the loyals and the disloyals is higher than the cost and that the cost is equal for both groups. However, with this assumption, there is no point for the autocrat to give bribes and create a loyal inner circle. In such a case, not giving any bribes would be the optimal strategy, which is not the assumption we can make to answer our desired hypothesis.

CHAPTER 4

EMPIRICAL EVIDENCE

We now move on to the testable implications of our theory. As we developed in Testable Prediction 1, more loyal inner circles lead to higher survival probabilities. As we developed in Testable Prediction 2, autocrats with more resources create more loyal inner circles. To test these implication, we need a plausibly exogenous variation in the autocrat's resources and data on the fraction of loyalists as well as the regime survival. In the next section we describe the data used to construct such measures.

4.1 Data

To estimate our hypothesis, we use data available through the "Varieties of Democracy" (V-Dem) dataset. We consider autocratic regimes between the historical (1789–1920) and contemporary (1900–2023) periods, covering 202 polities. The following indicators are used:

1. **Regime Support Groups (v2regsupgroups)**: Identifies which groups support

the current political regime and which are seen as the main sources of maintaining power.

2. **Number of Coup Attempts (e_pt_coup_attempts)**: Measures the number of coup attempts occurring in a year.

3. **Regimes of the World – The RoW Measure (v2x_regime)**: Classifies the political regime.

4. **Petroleum production per capita (e_total_oil_income_pc)**: Total real value of oil production per capita of a country.

The regime support group variable is constructed as a dichotomous scale where applicable checks are applied. This measure shows which groups support the current political regime by taking the mean of all given answers. The score varies between 0 (not supporting the regime to maintain power) and 1 (everyone agreeing that the group fully supports the regime). Although this proxy does not measure the size of the supporting group, it is the best available proxy for capturing loyal bureaucrats in the inner circle, represented by the v2regsupgroups_4 variable for state bureaucrats. The tests are conducted for party elites, business elites, and the military, with no significant differences observed.

We use log oil price per capita as a measure of a regime's resource endowment for several reasons. (1) Oil reserves are exogenous and are not affected by economic growth. Even though investment in oil extraction is influenced by economic development, country fixed effects will control for these differences. (2) Oil reserves are an important part of natural resources (Tsui, 2005). (3) Unlike other natural resources, oil is globally traded, and the market price for oil allows us to control for shocks (Egorov

et al., 2009). (4) There is strong evidence that an increase in oil reserves decreases democracy, and oil-rich countries tend to become more autocratic (Tsui, 2005).

4.2 Identification Method and Estimation

To test our hypothesis that an increase in an autocrat's natural resources increases the size of the support group and that this increase in support group size decreases the number of coup attempts in a year, we will use an IV strategy. The first stage equation is:

$$X_{it} = \gamma + \theta Y_{it} + \delta_{it} + \alpha_{it} + \varepsilon_{it}$$

Here, the subscript i represents the country and t denotes the year. The dependent variable, X_{it}, corresponds to the support group size. Y_{it} is the log oil price, δ_{it} is the country fixed effects and α_{it} is the year dummies. Given Testable Prediction 2, we hypothesize that $\theta > 0$.

The second stage equation is:

$$D_{it} = \alpha + \beta X_{it} + \delta_{it} + \alpha_{it} + \zeta_{it}$$

D_{it} denotes the revolt dummy, which is 0 if no coup attempts occurred in a given year and 1 if any coup attempts happened in that year. Given Testable Prediction 1, we hypothesize that $\beta < 0$.

Thus, we run the regression for autocratic regimes only. To investigate whether the theory holds for other political regimes, we also remove the restriction on political regimes and test for democracies as well. These results are provided in the Appendix.

Since we control for country fixed effects and year fixed effects, there is no need to control for log population size and log GDP per capita. The year dummies account for global oil price fluctuations.

4.3 Main Results

4.3.1 First Stage Results

Before we move on with our first stage results on the effect of log oil price per capita on the support group size, we esimate the results on three samples and four different support groups. Samples are constructed by excluding the top oil rich countries from the full sample to determine whether the results are driven by any outliers. As in Egorov et al. (2009), we first exclude the nondemocratic countries Qatar, Sudan, Angola, Mexico, and Azerbaijan which are the largest countries with the oil price shocks in between the years 1993-2007. Then, in the second restriction, we additionally exclude Vietnam, Canada, Gabon, Brazil, Equatorial Guinea, Libya, Congo Republic, and Colombia. Our regime support group variable (v2regsupgroups) includes 13 different subgroups. Four of them is related to our theoretical model: party elites, business elites, state bureaucrats and the military. We run the regression for those different four groups to see whether our theory holds for all of the subgroups that are defined as inner circle in the real world.

Table 4.1 presents the first-stage results across four samples for autocratic regimes. We show the results of the effect of log oil price per capita, a measure of natural resources, on the size of support groups for autocratic regimes across four different samples. For

all samples and all support groups, the coefficients are statistically significant at the one percent level. This result aligns with our theory. A one-point increase in log oil per capita increases the size of party elites by 2.5 percent, business elites by around 1 percent, state bureaucracy by around 2 percent, and the military by around 2 percent. Therefore, excluding the top countries with the highest oil production does not affect our results.

Table 4.1: Relationship Among Log Oil Per Capita and Support Group Size Democratic Countries Not Included

	(1) Full Sample	(2) Except Top 5 Countries	(3) Except Top 13 Countries
Party Elites			
Log oil per capita	0.025***	0.018***	0.024***
	(0.003)	(0.003)	(0.003)
R-squared	0.711	0.727	0.742
Business Elites			
Log oil per capita	0.009***	0.010***	0.009***
	(0.002)	(0.002)	(0.003)
R-squared	0.615	0.617	0.586
State Bureaucracy			
Log oil per capita	0.017***	0.019***	0.020***
	(0.002)	(0.002)	(0.002)
R-squared	0.810	0.814	0.815
Military			
Log oil per capita	0.017***	0.020***	0.015***
	(0.002)	(0.002)	(0.003)
R-squared	0.637	0.623	0.627
Observations	3,025	2,796	2,484

Robust standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%.

Table D.1 shows that when democratic countries are included in the samples, there is no significant difference in the support group sizes of party elites, business elites, and state bureaucracy between including only autocratic regimes and including all countries. This indicates that our theory holds not only for autocratic regimes but also for

democratic regimes. All the estimates are statistically significant at 1 percent. However, for the military, when log oil price per capita increases, the size of the military support group decreases when democratic countries included. We think that the military has a special characteristics different from other groups. In its nature, the military carries autocratic features (Geddes et al., 2014; Stier, 2015; Stockemer & Kailitz, 2020). Thus, it is not surprising to see difference in military for democratic countries and autocratic countries and we cannot conclude that it contradicts with our theory.

4.3.2 Second Stage IV Results

In Table 4.2, we present our OLS and 2SLS estimation results on the effect of party elites' and state bureaucrats' support group size of the regime on the revolt dummy. Our model is constructed upon the bureaucrats and party elites in an inner circle. We expect to see that an increase in the support groups size for state bureaucrats and party elites, there should be a decrease in the occurrence of a revolt in a country. The OLS estimation results are statistically significant at 5 percent level for state bureaucrats but not for party elites. The IV estimation results are statistically significant for all samples for state bureaucrats and negative which aligns with our theory but for party elites all estimates are positive except when top 13 countries with highest log oil production is excluded. This does not align with our theory and possible explanations of the contradictions will as follows:

Party elites play a crucial role in the power dynamics of authoritarian regimes, often being instrumental in both the rise and fall of leaders (Kricheli & Livne, 2011). Party elites gain power after supporting the autocratic leader which later will be a significant threat to the autocrat. This dynamic creates a situation where party elites are not just

Table 4.2: OLS and IV Regression Results for State Bureaucrats and Party Elites

	(1) OLS State B.	(2) OLS Party Elites	(3) IV State B.	(4) IV Party Elites
Full Sample				
State Bureaucrats	-0.133**		-1.727***	
	(0.067)		(0.551)	
Party Elites		-0.052		3.249*
		(0.051)		(1.920)
Except Top 5 Countries				
State Bureaucrats	-0.140**		-1.590***	
	(0.069)		(0.514)	
Party Elites		-0.053		2.555*
		(0.052)		(1.330)
Except Top 13 Countries				
State Bureaucrats	-0.152**		-0.920*	
	(0.074)		(0.546)	
Party Elites		-0.077		-6.178
		(0.055)		(13.297)

Robust standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%.

supporters but potential rivals, leading to a complex and often adversarial relationship. Furthermore, the initial support of party elites is almost a prerequisite for any leader's rise to power, resulting in a selection bias where leaders who lack such support rarely come to power. Therefore, the relationship between party elites and the regime is inherently unstable and marked by mutual dependence and distrust. This instability may explain why our model does not fully capture the dynamics of party elite support, leading to the observed positive estimates for party elites' support group size and revolt occurrence.

In Table E.1, we present our OLS and 2SLS estimation results on the effect of business elites' and military's support group size of the regime on the revolt dummy. Even our model is constructed upon the bureaucrats and party elites, our findings for party elites

and the military are aligned with our theory for all samples and for both groups. For all samples and for both groups, IV estimates are statistically significant and negative except for military when top 13 countries with highest log oil production is excluded. OLS results for military are insignificant for all samples while OLS results for business elites are statistically significant at 1 percent level except when top 13 countries with highest log oil production is excluded. All estimation results of the table shows that increase in the size of the supporter group in business elites and the military decreases the occurrence of a revolt in a country.

4.4 Robustness Check

In Table 4.3, we present the first-stage results across four samples for autocratic regimes using GDP per capita as the independent variable rather than log oil per capita. Even though GDP per capita is not an exogenous measure, by controlling for country fixed effects and year fixed effects, we were able to show that the estimates continue to hold with higher coefficients at the one percent level. The availability of more data points and the ongoing endogeneity problem (GDP per capita being related to economic development) could be the reasons for the difference. Each one-point increase in GDP per capita increases the party elites' support group size by around 18 percent, business elites' by around 11 percent, state bureaucrats' by around 14 percent, and the military's by around 10 percent across all samples.

Table 4.4 shows that for both state bureaucrats and party elites, an increase in the GDP per capita leads to a significant increase in the support group size which decreases the occurrence of a revolt. Unlike in Table 4.2, the IV estimation results in Table

Table 4.3: Relationship Among GDP Per Capita and Support Group Size Democratic Countries Not Included

	(1) Full Sample	(2) Except Top 5 Countries	(3) Except Top 13 Countries
Party Elites			
Log oil per capita	0.178***	0.174***	0.185***
	(0.004)	(0.004)	(0.005)
R-squared	0.519	0.517	0.517
Business Elites			
Log oil per capita	0.109***	0.108***	0.113***
	(0.003)	(0.004)	(0.004)
R-squared	0.593	0.588	0.581
State Bureaucracy			
Log oil per capita	0.140***	0.141***	0.143***
	(0.003)	(0.003)	(0.003)
R-squared	0.651	0.646	0.647
Military			
Log oil per capita	0.104***	0.107***	0.100***
	(0.004)	(0.004)	(0.004)
R-squared	0.555	0.555	0.558
Observations	10,649	10,265	9,721

Robust standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%.

4.4 show that an increase in the party elites' support group size also decreases the occurrence of a revolt, which is aligned with our theory. Specifically, the coefficients for state bureaucrats are -0.095 (OLS) and -0.756 (IV) for the full sample, indicating a substantial impact when using the IV estimation. For party elites, the coefficients are -0.102 (OLS) and -0.655 (IV), also showing a significant negative relationship. When excluding the top 5 countries, the pattern remains consistent with coefficients of -0.099 (OLS) and -0.711 (IV) for state bureaucrats, and -0.104 (OLS) and -0.628 (IV) for party elites. Excluding the top 13 countries yields similar results, with slightly stronger effects for state bureaucrats and party elites.

These results suggest that having a higher support group size decreasing the likelihood

of the revolt is robust across different samples, and the IV estimates generally show a stronger effect compared to the OLS estimates. This implies that GDP per capita is a significant factor in stabilizing autocratic regimes by increasing the support group size of key elites, thereby reducing the risk of a revolt.

Table 4.4: OLS and IV Regression Results for State Bureaucrats and Party Elites with GDP Per Capita

	(1) OLS State B.	**(2) OLS Party Elites**	**(3) IV State B.**	**(4) IV Party Elites**
Full Sample				
State Bureaucrats	-0.095***		-0.756***	
	(0.033)		(0.171)	
Party Elites		-0.102***		-0.655***
		(0.025)		(0.150)
Except Top 5 Countries				
State Bureaucrats	-0.099***		-0.711***	
	(0.033)		(0.169)	
Party Elites		-0.104***		-0.628***
		(0.025)		(0.151)
Except Top 13 Countries				
State Bureaucrats	-0.104***		-0.831***	
	(0.036)		(0.230)	
Party Elites		-0.116***		-0.598***
		(0.025)		(0.164)

Robust standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%.

Table F.1 shows that for business elites, both OLS and IV estimations are significant at the one percent level with negative estimates. However, the results for the military are mixed. The OLS estimation results are generally insignificant and sometimes positive, while the IV results are negative and significant for the full sample and when excluding the top 5 countries. When excluding the top 13 countries, the IV results are positive but insignificant. This suggests that the military's support group size might not have a straightforward relationship with the likelihood of a revolt, and the IV results indicate

a significant but complex interaction.

The results from our analysis provide robust support for the hypothesis that natural resources, measured by log oil price per capita, significantly impact the size of support groups in autocratic regimes. Across multiple samples and excluding top oil-rich countries to control for outliers, the size of support groups, particularly party elites, business elites, state bureaucrats, and the military, increases with rising oil wealth. This aligns with our theoretical expectations and indicates that natural resources promote likelihood of autocrat's survival by expanding the loyalty share of the autocrat's inner circle.

However, the dynamics differ slightly when democratic regimes are included. While the general pattern holds for party elites, business elites, and state bureaucrats, the size of the military's support group decreases with higher oil prices in democracies. This suggests a unique role for the military in different political contexts. Since the military has autocratic characteristics, we suspect that democratic regimes do not exhibit the same findings as those observed in our model.

Further analyses using GDP per capita instead of oil prices reinforce these findings, showing that increase in GDP per capita similarly increases support group sizes, which in turn decreases the likelihood of revolts. Unlike the results we found using log oil per capita for this analysis, the results for party elites are also consistent with our model. However, we cannot conclude that party elites are a good fit for our model. The reason is that, as mentioned before, the relationship between party elites and regime stability appears complex, explaining some deviations from theoretical expectations. The main reason for this deviation is that party elites do not satisfy the Laplacian property in our model. This is because these people already support the autocrat as a prior, could be

potential rivals, and benefit more from the continuity of the regime compared to other groups.

Overall, our findings highlight the crucial role of economic resources in maintaining autocratic regimes through expanding elite support. The consistent negative impact on revolt likelihood underscores the stabilizing effect of larger support groups, driven by natural resource wealth of the regime.

CHAPTER 5

DISCUSSION

In this thesis, we arrive at the following conclusions both analytically and empirically:

Firstly, we should state that our model does not take into account any cultural, religious, psychological, or historical developmental differences. Certainly, these dynamics will affect our results and interpretations, and we do not consider these dynamics to be unimportant. Although we attempt to control for such differences in our empirical study using control groups, it is not entirely possible to fully account for these types of dynamics.

Our analytical model results indicate that the probability of an autocrat's survival increases with the proportion of loyalists in their inner circle. Conversely, this probability decreases with the benefits bureaucrats gain from a rebellion and increases with the costs associated with the rebellion. The benefits obtained from a successful uprising can be considered in terms of the distribution of resources and rents after overthrowing the autocrat. On the other hand, the costs of the uprising can include potential imprisonment, economic decline due to changes in national order, impacts on citizen welfare, and all expenses necessary for the uprising. We know that these factors are

directly influenced by the regime's strength and the meritocracy within the inner circle. These are endogenous variables, and focusing on this endogeneity could lead to entirely different conclusions. Although we treat benefits and costs as fixed parameters in our model, there is potential to endogenize these factors, opening up new areas for research.

An increase in the resources available to an autocrat raises the bribes given, thereby increasing the proportion of loyal individuals in the inner circle. Consequently, the higher the proportion of loyal individuals in the inner circle, the lower the likelihood of a rebellion against the regime.

As a result of our empirical study, supported by literature on autocratic regimes being oil-rich countries, we used log oil price per capita as a regime resource and found that an increase in log oil price per capita positively affects the sizes of regime support groups. The fact that this relationship is positive for all the support groups we examined supports the results of our analytical model. Secondly, in our IV stage results, we observe that an increase in the size of support groups reduces the number of coup attempts. In our empirical study, these uprisings are not limited to those initiated solely by bureaucrats. The reason is to investigate the impact of the close circle formed by loyal individuals through bribery on uprisings against the regime, both directly and indirectly. Considering the establishment of our analytical model, we believe that including state bureaucrats in these groups is the most appropriate. In our results, we find different outcomes for the military in robustness checks, which we believe is due to the unique autocratic structure of the military and thus cannot be fully explained by our model. Additionally, we reach similar results for party elites and business elites as we do for state bureaucrats, and we observe that these results do not contradict our analytical model.

While initiating our empirical study, we first considered aligning our model with the party elites as the support group. However, we subsequently discovered that this approach led to a selection problem, as evidenced by the divergent results in our first-stage outcomes. We believe this discrepancy arises from the following dynamic: an autocrat is nominated by their party due to the support they receive within it. Subsequently, the party elites maintain their presence in the party to the extent that the autocrat desires. Although this dynamic could be described as being supported by corruption, the fact that the autocrat is selected by existing supporters and then continues to retain those supporters within the party leads to a selection problem. Additionally, the performance-loyalty trade-off, which was our initial motivation for the model, does not manifest clearly within the party system. Therefore, we believe that the group supporting our model should be state bureaucrats.

CHAPTER 6

CONCLUSION

This study has provided a comprehensive examination of the dynamics between autocratic regimes, the size of their support groups or the loyalty share of their inner circle, and the likelihood of regime survival. By integrating both theoretical and empirical approaches, we have drawn several key conclusions about how natural resources and thus autocrat's repression and bribe influence the loyalty and behavior of elite groups within these regimes.

Firstly, our theoretical model under the Absolute Loyalty assumption highlights that the cost to bribed loyalists from potential uprisings outweighs the benefits. The conclusion we reach under the Absolute Loyalty condition shows that the autocrat's ability to maintain their regime depends on increasing this cost through repression, imprisonment, fear, and restrictions, reducing the benefit people would gain from a potential uprising, and the proportion of loyal people in their inner circle that they would form over the years. This explains the cycle that authoritarian regimes enter, where ending repression and bribery would be fatal to the regime itself. It emphasizes the necessity for an autocrat who has started a regime of oppression and bribery to continuously increase these measures. However, due to bounded natural resources, this behavior leads

to the increasing impoverishment of their people.

Conversely, the Conditional Loyalty assumption demonstrates that even bribed bureaucrats may choose to revolt if the perceived benefits of overthrowing the regime surpass the costs. In the model we developed with the Conditional Loyalty assumption, we allow all bureaucrats to participate in the revolt. Even though we consider the cost for bureaucrats who have been made loyal through bribery to be higher than for other bureaucrats, the benefit they would gain from overthrowing the autocrat is above the cost for all bureaucrats. Therefore, a successful revolt is desired by both groups. However, in this situation, we encounter two different signal thresholds. As we demonstrated in Proposition 6, having two different thresholds is not possible. If disloyals believe the regime is strong enough to deter revolts yet also weak enough to be overthrown without loyal support, it creates a paradox. Loyals, observing this confidence, would adjust their perception, leading to a unified view of the regime's strength, ensuring a single threshold.

Empirically, our analysis confirms that natural resources, as measured by log oil price per capita, significantly increase the size of support groups in autocratic regimes, which corresponds to the loyalty share of the autocrat's inner circle in our theoretical model. This effect remains robust even when excluding top oil-rich countries to control for outliers. However, the inclusion of democratic regimes introduces complexity, particularly regarding the military, whose support group size decreases with higher oil prices in democracies. This suggests a unique role for the military in different political contexts.

Further, our analysis using GDP per capita instead of oil prices reinforces these findings, showing that economic development similarly increases support group sizes,

thereby reducing the likelihood of revolts. Notably, the relationship between party elites and regime stability appears complex, with deviations from theoretical expectations likely due to the adversarial nature of their relationship with the autocrat.

In conclusion, this study contributes to our understanding of the dynamics between autocratic regimes, elite loyalty, and regime stability. Overall, our findings underscore the crucial role of economic resources in maintaining autocratic regimes by expanding elite support. The consistent negative impact on revolt likelihood highlights the stabilizing effect of larger support groups driven by natural resource wealth. However, the inherent instability due to the reliance on bribery and repression poses a significant challenge for autocratic leaders. As regimes become increasingly dependent on these measures, they create a cycle of deepening oppression and economic hardship, ultimately threatening their own stability.

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APPENDIX A

PROOF OF PROPOSITION 1

The Laplacian property means that when players have no information about others' actions, they assume all outcomes are equally likely. This is based on Laplace's idea that without specific information, one should assume a uniform probability distribution (Laplace, 1829; Morris & Shin, 2003). In our model settings for absolute loyalty, the bureaucrats who have taken bribes will remain loyal in any case. This results in a homogeneous population of disloyal bureaucrats.

Laplacian property: For any threshold type $\hat{x}$,

$$\Pr(x_i \leq \hat{x} \mid \theta = \hat{\theta}) = 1 - \Pr(\theta \leq \hat{\theta} \mid x_i = \hat{x})$$

1) **Belief consistency**

$$\theta^* = \Pr(x_i \leq x^* \mid \theta = \theta^*)$$

2) **Individual rationality**

$$c = b \cdot (1 - \alpha) \cdot \Pr(\theta \leq \theta^* \mid x_i = x^*)$$

To obtain closed-form solutions, $\eta \to 0$.

$$\text{As } \eta \to 0, \quad \Pr(\theta \leq \theta^* \mid x_i = x^*) = \Pr(x_i \geq x^* \mid \theta = \theta^*)$$

By using the Laplacian Property,

$$\begin{aligned}(1-\theta^*) &= 1 - \Pr(x_i \leq x^* \mid \theta = \theta^*) \\ &= \Pr(x_i \geq x^* \mid \theta = \theta^*) \\ &= \Pr(\theta \leq \theta^* \mid x_i = x^*)\end{aligned}$$

From the Individual Rationality, we know that;

$$\Pr(\theta \leq \theta^* \mid x_i = x^*) = \frac{c}{b(1-\alpha)}$$

Then,

$$\theta^* = 1 - \frac{c}{b(1-\alpha)}.$$

APPENDIX B

PROOF OF PROPOSITION 4

$$\frac{\partial^2 \Phi}{\partial Y \partial \alpha} = \frac{c}{b(1-\alpha)^2} > 0$$

Since $b > 0$, $c > 0$, and $\alpha \in [0,1)$, the cross derivative is positive, by Milgrom and Shannon (1994). Then, α^* is increasing in Y.

APPENDIX C

PROOF OF PROPOSITION 5

$$\frac{\partial^2 \Phi}{\partial b \partial \alpha} = \frac{c\left(K'(\alpha)(1-\alpha) - (Y - K(\alpha))\right)}{b^2(1-\alpha)^2}$$

By Milgrom and Shannon (1994), when $K'(\alpha)(1-\alpha) > Y - K(\alpha)$,

$$\frac{\partial^2 \Phi}{\partial b \partial \alpha} = \frac{c\left(K'(\alpha)(1-\alpha) - (Y - K(\alpha))\right)}{b^2(1-\alpha)^2} > 0$$

When $K'(\alpha)(1-\alpha) < Y - K(\alpha)$,

$$\frac{\partial^2 \Phi}{\partial b \partial \alpha} = \frac{c\left(K'(\alpha)(1-\alpha) - (Y - K(\alpha))\right)}{b^2(1-\alpha)^2} < 0$$

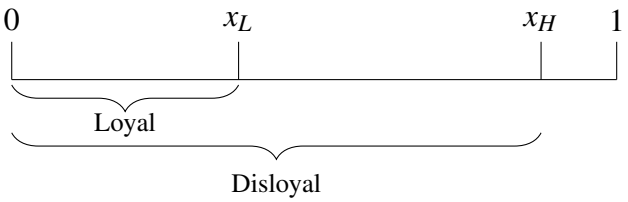
APPENDIX D

PROOF OF PROPOSITION 6

Non-Existence of Two Different Signal Threshold

Assume noises are bounded, and $x_L^* \neq x_H^*$, For any threshold $x_i^*; x_i \neq x_i^*$, there exists a rationalizable action strategy

$$s_i^*(x_i) = \begin{cases} 0 & \text{if } x_i > x_i^* \\ 1 & \text{if } x_i < x_i^* \end{cases}$$



Suppose $x_i^* = x_H^*$, then $x_i < x_H^*$,

1)

$$\frac{\underline{c}}{b} = \Pr(\theta \leq \theta_H^* \mid x_i = x_H^*) \in (0,1)$$

2)

$$\frac{\overline{c}}{b} = \Pr(\theta \leq \theta_L^* \mid x_i = x_L^*) \Rightarrow \frac{\overline{c}}{b} = 1 \Rightarrow \overline{c} = b$$

This is a contradiction by our conditional loyalty assumption that $b > \overline{c}$.

As $\sigma \to 0$, it is not possible that the thresholds x_L^* converge to limit θ_L^*, and x_H^* converge to limit θ_H^*. Thus, there cannot be two different signal thresholds θ_L^* and θ_H^*.

APPENDIX E

FIRST STAGE RESULTS-ALL COUNTRIES

Table E.1: Relationship Among Log Oil Per Capita and Support Group Size Democratic Countries Included

	(1) Full Sample	(2) Except Top 5 Countries	(3) Except Top 13 Countries
Party Elites			
Log oil per capita	0.025***	0.023***	0.025***
	(0.002)	(0.002)	(0.002)
R-squared	0.635	0.636	0.635
Business Elites			
Log oil per capita	0.004***	0.004***	0.006***
	(0.001)	(0.001)	(0.001)
R-squared	0.608	0.609	0.596
State Bureaucracy			
Log oil per capita	0.004***	0.004***	0.000
	(0.001)	(0.001)	(0.001)
R-squared	0.743	0.742	0.736
Military			
Log oil per capita	-0.012***	-0.012***	-0.015***
	(0.002)	(0.002)	(0.002)
R-squared	0.652	0.648	0.647
Observations	4,884	4,644	4,177

Robust standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%.

APPENDIX F

ADDITIONAL IV RESULTS

Table F.1: OLS and IV Regression Results for Business Elites and Military

	(1) OLS Business E.	(2) OLS Military	(3) IV Business E.	(4) IV Military
Full Sample				
Business Elites	-0.065*		-1.020***	
	(0.038)		(0.318)	
Military		-0.040		-0.902***
		(0.042)		(0.273)
Except Top 5 Countries				
Business Elites	-0.068*		-1.092***	
	(0.039)		(0.362)	
Military		-0.038		-0.819***
		(0.042)		(0.253)
Except Top 13 Countries				
Business Elites	-0.058		-0.511*	
	(0.040)		(0.301)	
Military		-0.012		-0.978
		(0.047)		(0.643)

Robust standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%.

APPENDIX G

ADDITIONAL ROBUSTNESS CHECK

Table G.1: OLS and IV Regression Results for Business Elites and Military with GDP Per Capita

	(1) OLS Business E.	(2) OLS Military	(3) IV Business E.	(4) IV Military
Full Sample				
Business Elites	-0.075***		-0.326***	
	(0.021)		(0.071)	
Military		0.019		-2.136***
		(0.022)		(0.829)
Except Top 5 Countries				
Business Elites	-0.075***		-0.317***	
	(0.022)		(0.073)	
Military		0.026		-2.072**
		(0.022)		(0.846)
Except Top 13 Countries				
Business Elites	-0.067***		-0.264***	
	(0.022)		(0.070)	
Military		0.040*		4.428
		(0.023)		(3.720)

Robust standard errors in parentheses. *Significant at 10%; **Significant at 5%; ***Significant at 1%.