Endogenous Regime Change: How Different Authoritarian Regimes Trigger Collective Action that Harm Themselves *

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Abstract

In this paper, we replicate and extend Jeremy Wallace's "Cities, Redistribution, and Authoritarian Regime Survival", originally published in *The Journal of Politics* (2013). Using cross-national time series data, we re-examine the durability of authoritarian regimes by exploring the relationship between regime types and collective action. First, we find that certain regime types are associated with an increased propensity of collective action. Elite-level collective action is more prevalent under military regimes, and less so under monarchic and single-party regimes. Second, under different types of dictatorship, the threat to regime longevity posed by collective action varies. We show that military and single-party regimes are more vulnerable to *elite*-level conflict. Our study further suggests that military dictatorships are the most fragile type of authoritarian regime. These regimes are associated with a higher likelihood of elite-level collective action, which in turn significantly harms their longevity. Single-party regimes, on the other hand, are more resilient to both mass- and elite-level collective action events. Finally, monarchic regimes, in addition to experiencing higher rates of mass-level action, are more likely to collapse when faced with mass-level uprisings, suggesting a reduced capacity to control large-scale events.

1 Introduction

Students of authoritarian politics have considerable interests in explaining the durability of different autocracies. Existing literature has addressed two fundamental tensions within dictatorships: the conflict between the ruler and the masses, and the conflict between a ruler and his ruling coalition. On the one hand, popular uprisings can escalate into massive civil unrest, which threatens the legitimacy and stability of authoritarian rule (e.g., Kuran, 1991; Celestino and Gleditsch, 2013;

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Chenoweth and Stephan, 2011; Teorell, 2010; Ulfelder, 2005; Wallace, 2014). As a consequence, dictators invest many resources into penetrating civil society and repressing any efforts of spontaneous collective actions (King, Pan, and Roberts, 2013). On the other hand, dictators also need to ensure the loyalty and the cohesion of their elite supporters. Most autocrats lose their power through a coup, indicating that the primary threat to authoritarian survival stems from insiders (Goemans, Gleditsch, and Chiozza, 2009; Svolik, 2009, 2012).

Under the typology of authoritarian regimes developed by Geddes (1999), Gandhi and Przeworski (2007), and Magaloni (2008), autocracies with different political institutions deal with political threats in different ways; their approaches largely influence the odds of authoritarian survival. Although some scholars have studied the relationship between regime types and mass-level collective actions (Ulfelder, 2005; Magaloni and Wallace, 2008), little empirical evidence examines both elite- and mass-level political conflicts to show how the distinctions among dictatorships shape political conflicts, and how these conflicts affect regime longevity.

The argument presented in this paper is that political change is endogenous to certain types of authoritarian regimes. Some autocracies are less durable because they are more likely to experience collective action that is more threatening to regime durability. Our findings show that military dictatorship is the most vulnerable type when compared to others, as it is associated with a higher possibility of elite-level collective action, which, when experienced, greatly harms leadership tenure. Single-party regimes, though also threatened by elite conflicts, are more capable of controlling mass-level collective action and preventing such movements from transferring into elite-level strife. Further, elite-level collective action is less frequently seen under monarchic regimes, and the collapse of monarchy is more likely to be triggered by bottom-up uprisings. These endogenous political changes can partly explain the discrepancies of authoritarian durability among different regime types.

The remainder of this article proceeds as follows. To begin, we re-examine Wallace's argument and check the robustness of his conclusion. Next, we extend his work by exploring the "endogenous political change" in different types of autocracies. Our analysis is then divided into three parts. First, we introduce the division between elite-level collective action and mass-level collective action. Second, we discuss how different types of authoritarian regimes provide different opportunities for the formulation of collective action, and how these events impact the durability of authoritarian

regimes. Third, we move to the empirical analysis of our argument by comparing the stability of different authoritarian regimes from the perspective of collective action. To conclude, we revisit the existing literature, discussing our contributions and questions to be studied in the future.

2 Reexamining Wallace's Argument

Wallace argues that authoritarian regimes often enact policies in the short run that are conducive to their survival, but that are harmful in the long run. First, he claims that threats to the regime stem from high levels of urban concentration (defined to be the proportion of the urban population that lives in the capital city), because larger populations can more easily organize destabilizing collective action. To reduce this threat, autocrats enact policies of 'urban bias,' which redistribute resources from the countryside to the cities, with the intention of placating potentially dangerous urban residents. The secondary effect of this, however, is induced migration into the cities. This exacerbates urban concentration, which increases the threat posed to the regime, and which ultimately requires further redistributive policies. This cycle is not sustainable, and Wallace shows that it ultimately leads to an increased likelihood of regime change.

For the most part, we are able to replicate the results from Wallace's paper exactly. There are some minute differences caused by switching from `Stata` (used to produce the original results) to `R`. However, two questions arose upon examination of his methodology and data. First, it seems likely that Wallace's models were incompletely specified. We find it unlikely that the level of urban concentration is the only (or primary) driver of collective action events. Given that the data available in his replication code had ≈ 300 variables, we chose to run a LASSO procedure to highlight the plausibility of omitted variables in his analysis. We re-run his analyses in Table 1 with the addition of LASSO-identified variables to show that factors other than urban concentration plausibly affect the likelihood of collective action. The results of this are presented in Table 1 below.

With the addition of the LASSO-identified variables, his conclusions hold for model 1.1 and 1.4. Under the LASSO specification, urban concentration in both model 1.1 and 1.4 retains a positive sign and statistical significance. Similarly, GDP growth retains its theoretically posited negative sign and its statistical significance. Though none of the LASSO-identified variables have explanatory power in model 1.1, several new variables appear to drive the results in model 1.4.

Table 1: Urban Concentration Linked to Collective Action (LASSO)

	PRIO Data			Banks Data
	Model 1.1	**Model 1.2**	**Model 1.3**	**Model 1.4**
	Logit	Negative Binomial	Logit	Negative Binomial
Urban Concentration	2.165^{*}	0.943	-5.118^{***}	2.924^{***}
	(1.262)	(1.881)	(0.863)	(.459)
GDP Growth	-2.708^{***}	-1.956^{***}	0.928^{*}	-1.496^{***}
	(0.839)	(0.663)	(0.534)	(.273)
Real GDP per Capita (logged)			0.800^{***}	
			(0.178)	
Openness to Trade	−0.001			
	(0.003)			
Overurbanization	−1.265			
	(1.815)			
Exchange Rate		0.000		
		(0.000)		
Conflict Count (External and Internal)		0.239^{***}		0.016
		(0.088)		(0.064)
Exchange Rate (measure 2)		−0.000		
		(0.000)		
Migration Restriction		0.216^{*}		
		(0.131)		
Urban Population (logged)			−0.251	0.345^{*}
			(0.260)	(0.177)
Overurbanization (measure 2)			-10.030^{***}	
			(3.679)	
Interstate War			-0.427^{*}	
			(0.253)	
Economic Crisis			−0.129	
			(0.270)	
Number of Party Coalitions			0.194^{***}	
			(0.073)	
Party Fractionalization			-0.000^{***}	
			(0.000)	
Number Major Constitutional Changes			-1.275^{***}	0.475^{***}
			(0.146)	(0.060)
Number of Major Cabinet Changes			-0.819^{***}	
			(0.085)	
Polity 2 Score				0.042^{***}
				(0.007)
Total Population (logged)				-0.964^{***}
				(0.308)
Conflict (Binary)				0.445^{***}
				(0.097)
Sub-Saharan African				−0.545
				(0.470)
Western European/North American				3.24^{***}
				(0.541)
Parliamentary Responsibility				−0.002
				(0.043)
Number Changes in Effective Executive				0.448^{***}
				(0.038)
Constant	0.035	0.949	−1.782	5.301^{**}
	(1.181)	(1.028)	(2.430)	(2.299)
Observations	1,501	807	3,621	3,700

Note: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2: Urban Concentration Linked to Collective Action (LASSO and Multiple Imputation)

	PRIO Data			Banks Data
	Model 1.1	**Model 1.2**	**Model 1.3**	**Model 1.4**
	Logit	Negative Binomial	Logit	Negative Binomial
Urban Concentration	0.458	0.643	-2.325^{***}	0.988^{***}
	(1.011)	(0.434)	(0.073)	(0.249)
GDP Growth	-3.952^{***}	-3.842^{***}	0.077	-0.862^{**}
	(0.661)	(0.510)	(0.051)	(0.350)
Real GDP per Capita (logged)			0.081^{***}	
			(0.016)	
Openness to Trade	-0.008^{**}			
	(0.003)			
Overurbanization	−1.097			
	(0.726)			
Exchange Rate		0.000		
		(0.000)		
Conflict Count (External and Internal)		0.385^{***}		−0.036
		(0.072)		(0.059)
Exchange Rate (measure 2)		−0.000		
		(0.000)		
Migration Restriction		−1.310		
		(0.156)		
Urban Population (logged)			-0.101^{***}	0.255^{**}
			(0.022)	(0.110)
Overurbanization (measure 2)			0.024	
			(0.198)	
Interstate War			-0.109^{***}	
			(0.030)	
Economic Crisis			−0.021	
			(0.034)	
Number of Party Coalitions			0.018^{*}	
			(0.011)	
Party Fractionalization			-0.000^{***}	
			(0.000)	
Number Major Constitutional Changes			-0.185^{***}	0.466^{***}
			(0.017)	(0.053)
Number of Major Cabinet Changes			-0.109^{***}	
			(0.010)	
Polity 2 Score				0.039^{***}
				(0.006)
Total Population (logged)				0.068
				(0.271)
Conflict (Binary)				0.646^{***}
				(0.094)
Sub-Saharan African				−0.545
				(0.470)
Western European/North American				3.24^{***}
				(0.541)
Parliamentary Responsibility				0.009
				(0.049)
Number Changes in Effective Executive				0.512^{***}
				(0.034)
Constant	0.298	0.970^{*}	-0.588^{***}	−2.571
	(1.090)	(0.495)	(0.188)	(2.385)
Observations	5,088	5,088	1,159	5,088

Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Notably, major constitutional changes, changes in the executive, an increase in a given country's Polity score (level of democracy), being a Western European or North American country, or experiencing conflict make collective action events more likely. This intuitively makes sense, as these are indications of major shifts in the political environment, and may spur collective action. In sum, the inclusion of the LASSO-identified variables corroborates Wallace's arguments for model 1.1, and adds additional depth to his argument for model 1.4.

However, the results for model 1.2 and 1.3 present challenges to his theory. In model 1.2, the statistical significance of urban concentration vanishes. Instead, the number of external or internal armed conflicts and the level of migration restriction assumes greater power in explaining an increase in the likelihood of collective action events, while GDP growth retains its significance and theoretically expected sign. Regardless, this does not totally contradict his theory; it may simply be the case that the countries in the data are sensitive to these additional covariates. Model 1.3, in contrast, presents puzzling results. Using the additional LASSO-identified variables causes urban concentration and GDP growth to retain their significance, but assume the opposite sign of what Wallace theoretically expects. As these problems persist through the multiply-imputed data analysis below, we are unsure how to explain these results. Despite this, the fact that the other three models, at worst, expand slightly on his theory, and at best, corroborate it, sheds a favorable light on his argument.

Secondly, the data was characterized by a high-degree of missingness. Only complete rows of data were used in his analysis; non-complete rows were thrown out. As can be seen in the 'observations' row in Table 1 of Wallace's paper, he only uses between 1,585 and 3,775 observations of the original 5,088 rows in his dataset for models 1.1 through 1.4. The addition of LASSO-covariates reduces this number even further, as can be seen in Table 1 above. As this is missingness due to randomness, we believe that a multiple imputation procedure is appropriate. We create 10 multiply-imputed data sets for each of his 2 data sets (for a total of 20 multiply-imputed datasets) using the MICE package in R, and re-run his analyses in Table 1 with the addition of the LASSO-identified covariates. The results of this are presented in Table 2 below [1].

Again, model 1.4 corroborates his theory, and adds additional explanatory depth. Urban concentration and GDP growth retain their expected signs and significance. Similar to the previous

[1] See the Appendix for an explanation of LASSO procedures, imputation procedures, and data missingness.

results, covariates associated with democratic countries or major shifts in the political environment make collective action more likely (the same covariates as in model 1.4 in Table 1 above). For model 1.1, urban concentration has lost its explanatory power under the multiply-imputed data. This contrasts with model 1.1 in Table 1. GDP growth and openness to trade, however, both make collective action less likely, and thus, the results, at worst, do not indicate against his theory, but rather affirm its plausibility. The results for these covariates are in line with his economic development theory.

As before, model 1.2 does not confirm his results, and model 1.3 poses serious challenges. Similar to table 1, the significance of urban concentration vanishes, and instead, the number of incidents of conflict (either external or internal) seem to be driving the results. The effect of urban concentration is ambiguous, however, underscoring the potential in his argument. Finally, the unexpected results for model 1.3 persist through the multiply-imputed data sets. We leave model 1.3 to be explored by future researchers.

In total, Wallace's argument seems to hold up to attempted data fixes. After identifying further variables of interest and correcting for the severe missingness in his data, models 1.1, 1.2 and 1.4 at worst point to the plausibility of his argument, and at best, corroborate his results. Despite the unexpected results in model 1.3, we believe that these procedures speak well for Wallace's underlying argument. The following sections extend this argument.

3 Regime Types, Political Conflicts, and Potential Regime Change

This section examines how different types of authoritarian regimes engender conditions for the formulation of collective action. First, we provide reasons for why elite-level and mass-level collective action cannot be treated as a homogenous variable. The two types are interconnected variables, but distinct variables based on a different logic of formulation. Next, we analyze how different regime triggers collective action and how their survival is endangered by the emergence of contentious events.

3.1 Elite-level and Mass-level Political Conflicts

Wallace tells a story of how high urban concentration facilitates bottom-up collective action and thus harms the survival of authoritarian regimes. His measurement, however, fails to differentiate mass-level collective action from elite-level collective action. In his analysis, collective action includes eight aspects: assassinations, general strikes, guerilla warfares, government crises, purges, riots, revolutions, and anti-government demonstrations. In a general sense, assassinations, government crises, and purges are more associated with the internal division between political elites rather than bottom-up social events. Hence, it is necessary to divide the two kinds of collective action and examine how they are correlated with different regime types respectively.

The logic of external and internal collective action is not identical. For mass-level collective action, these events usually follow a bottom-up trajectory, where discontented citizens initially emerge among the grassroots and fuel mass-level behavioral rebelliance against the state. Typical examples include Poland's Solidarity contesting communist rule (Ekiert, 1996), Korean citizens rising up against the military dictatorship (Koo, 1993; Kim, 2000), and the Tunisian Revolution ousting the long-term President Ben Ali (Chomiak, 2011). To prevent bottom-up resistance, the state struggles with identifying potential threats and repressing contentious political events that are hazardous to regime legitimacy. This part is closely associated with state's penetration into the society. Whether local officials are capable of obtaining adequate information at the grassroots level (Scott, 1998; Hayek, 2007), whether hierarchical political structure allows political opinions to be transferred to the central government (Shue, 1990; Migdal, Kohli, and Shue, 1994), and whether there are efficient social networks to ensure the compliance of society (Evans, 1995; Tsai, 2007) significantly determine the frequency of mass-level collective action.

By comparison, the main reason behind elite-level collective action usually lies within the state itself. Fractional divisions, state incapacity, and interest conflicts could all serve as the sources of elite strife. This type of collective action follows a top-down direction, where the vital changing point is the top decisions made by political elites. Typical examples include Chiang Ching-kuo's compromise with intellectuals to push forward the democratic transformation in Taiwan (Hsiao and Koo, 1997) and Boris Yeltsin's coup opposing the rule of Gorbachev in Soviet Republic (Kotz and Weir, 2013). To prevent elite-level conflicts, many autocrats work hard on enhancing elite cohesion

(Levitsky and Way, 2012), institutionalizing the succession system (Dittmer, 1990), and recruiting new political supporters (Konrád and Szelenyi, 1979).

To clarify, elite-level collective action and mass-level collective action can sometimes be interconnected. Elite divisions offer political opportunities for protesters to find their supporters inside the government. Meanwhile, grassroots riots and demonstrations can trigger elite antagonization. The Tiananmen incident, for instance, shows how a spontaneous uprising was bailed out by the soft-line governors, and subsequently led to the fall of the pro-reform politicians.

To sum up, the mechanisms behind the formulation of mass- and elite-level collective action are different. Whereas the determinants of mass-level collective action usually lie in the interactions between the state and the society, the factors that influences the propensity of elite level collective action are usually found within the ruling coalition. The following two questions are, how authoritarian regimes provide various kinds conditions for the emergence of collective action and how the varieties of collective action impact the survival of authoritarian regimes.

3.2 Endogenous Political Change in Different Authoritarian Regimes

Whether certain types of authoritarian regimes can affect the probability of collective actions at mass and elite level, depends on how the regimes can maintain the political loyalty among their ruling coalition and citizens. An autocracy without stable power-sharing mechanisms lowers the payoff of marginalized factions, increases the uncertainty of elite coordination, and faces higher probability of elite rebellions (de Mesquita et al., 2005; Svolik, 2009, 2012). Likewise, if an authoritarian regime cannot control the masses through systematic combination of repression and co-optation, it may increase dissatisfaction among citizens, and finally highlight the odds of mass movements.

Once the mass- and elite-level collective actions happen, their effects on authoritarian durability vary across different regime types. The determinant of regime vulnerability is the organizational capacity and ideational commitment of collective action under different types of regimes. Single-party regimes, military regimes, and personalist regimes are more effective in handling the threats of popular uprising because the capacity of the rebels is relatively weaker than the dictator. Autocrats use their coercive apparatus to intimidate and suppress demonstrations, exploit state resources to buy off movement activists (Levitsky and Way, 2010), or to even cut off the channel for information

sharing so as to preempt larger popular protests (King, Pan, and Roberts, 2013). By contrast, these regimes are more vulnerable to the political conflicts within ruling coalition due to two reasons: first, the opposition elite factions often have more resources than ordinary people to bargain and reach a favorable pact with the incumbent. Second, under authoritarian regimes (except for monarchies), the elites have little ideational commitment to the original institutional arrangement. Thus, they are less constrained by legitimacy and moral issues when pose threats to the current regimes. The configuration of the two correlations described above is plotted in Figure 1.

Figure 1: The Probability and the Degree of Threats of Collective Actions

		Political Loyalty: High	Political Loyalty: Low
Organizational Capacity	High	Collective action is less likely to happen and more threatening	Collective action is less likely to happen and more threatening
	Low	Collective action is likely to happen and less threatening	Collective action is more likely to happen and less threatening

Military Regime

A military regime is considered as one in which military officers or retired military officers hold strong controls over important political jobs (Geddes, 1999). It is the military juntas that determine who rules the country. The policy interests of officer corps include the survival and efficacy of their military institutions, the autonomy from civilian government, the budgets for recruitment and weaponry, and the territory integrity of the nation and internal order.

Mass-level collective action causes fewer trouble to the survival of military regime. military rulers attach importance to the internal order. They have less pressure when they decide to repress the masses by force. A coercive apparatus is commonly adopted to deter citizens and the potential protesters, reducing the probability of mass movements.

However, military dictatorship is more likely to trigger elite conflicts that jeopardize the regime stability. The imperfect information among juntas makes it difficult for different military factions to cooperate in a coup. The officer corps will not join the coup unless they ponder others will

also join the conscriptcy against the civilian government. The unstable coalition between military factions renders the regime more likely to break down. We can summarize the above ideas as the following hypotheses:

Hypothesis 1. *Being a military regime is more likely to increase the probability of elite-level collective action.*

Hypothesis 2. *Compared to mass movements, military regimes are more vulnerable to elite-level collective action.*

Single-party Regime

A single-party regime refers to the one where the party organization has the decisive power over policy making, and controls most access to important positions (Geddes, 1999). The hegemonic party is effective in maintaining elite cohesion. Both incumbent faction and rival faction can benefit from holding offices together (Geddes, 1999). It encourages the coordination among elites and broadens the ruling coalition for authoritarian rule. Moreover, a hegemonic party often sets up institutionalized leadership succession, which provides potential successor and his factions clear information that their future payoffs are guaranteed, and prevent them from usurping the incumbent's power (Wang, 2017).

A single-party regime also has advantages on controlling the masses. The party institutions can co-opt low-level cadres through assigning costly but politically valuable party service in party members' early career, while delaying the benefits of party membership to a later point. Low-level cadres' costly service becomes "sunk investment" when they are finally promoted to a higher level position and reap the material benefits (Svolik, 2012). This institutional arrangement guarantees to party members that their investment in the existing party organizations will pay off over the long run (Magaloni, 2008).

Hypothesis 3. *Being a single-party regime is more likely to reduce the probability of both elite-level and mass-level collective action.*

Hypothesis 4. *Compared to mass movements, single-party regimes are more vulnerable to elite-level collective action.*

Personalist Regime

Geddes (1999) defines personalist regime as ones in which the political leader often comes to power by a coup or as a hegemonic party leader, but later consolidates his power over policy and recruitment in his own hand through marginalizing other officers or reducing the function of his party. The decision-making process in a personalist regime is largely determined by the discretion of an individual leader.

Personalist regime is less effective in reducing elite split than single-party regime due to two reasons: first, the majority factions in alignment with the dictator can obtain more benefits when they purge other minority factions. The minority cliques excluded from inner circle will receive severe punishments from the dictator, such as poverty, assassination, and exile. The large gaps of their payoffs can exacerbate the political struggles within the regime, and further trigger regime collapse. Second, the succession arrangement in personalist regimes often remains uncertain. A potential successor with imperfect information is more likely to launch coups against the incumbent dictator, so as to protect his interests regarding the final succession decisions (Wang, 2017).

Hypothesis 5. *Being a personalist regime has no significant advantages of controlling mass-level and elite-level collective action.*

Hypothesis 6. *Personalist regimes are vulnerable to both elite- and mass-level collective action.*

Monarchic Regime

In a monarchy, the ruling coalition is often the family members of the king with absolute authority in appointing important political positions (Gandhi, 2008). On the one hand, compared to personalist regimes, contemporary monarchic regimes can strengthen elite cohesion through inviting other dynastic cliques (Herb, 1999), and setting up kinship-based succession rules. On the other hand, the power of absolutist monarch has less linkage with the society. The lack of social contract with population make a king unable to co-opt the masses into his royal families. Therefore, the monarchies can mitigate the severity of elite conflicts, but are less effective in reducing mass movements.

However, the most important factor in the collapse and transformation of a monarchy is the opposition's ideational commitment in political conflicts. At the elite level, the opposition force

primarily requires more power under the monarchical framework, but not to change the ultimate power structure. Hence, political conflicts outside the ruling coalition have more possibility to challenge the traditional institutions. For monarchical regimes, the democratic transitions are more likely to be introduced by power outside the elite groups.

Hypothesis 7. *Being a monarchic regime is more likely to reduce elite-level collective action.*

Hypothesis 8. *Monarchic regimes are more vulnerable to mass-level collective action.*

4 Empirics

4.1 Data and Methods

The data comes from the Cross-National Time Series Dataset (https://www.cntsdata.com/), which compiles records of political conflict based on local media reports. Our analysis covers 365 authoritarian regimes across the period from 1945 to 2004. To measure the amount of elite-level collective action, we calculate the aggregate number of assassinations, purges, and government crises that took place every year. For mass-level collective action, we measure the aggregate number of general strikes, guerrilla warfare, riots, revolutions, and anti-government demonstrations every year.

Our study seeks to look into two causal mechanisms. The first one is how regime types influence the frequency of mass-level and elite-level collective action. The dependent variables are the count numbers of collective action. The independent variables are the regime types: military, monarchic, single-party, and personalist regimes. We use negative binomial model to conduct our analysis. To detect model dependence, we also run logistic regression to check if the results still hold.

The second question is how different kinds of collective action threaten the survival of authoritarian regimes. We subset the dataset according to regime types. The independent variable is the duration of each regime. To identify regime change, we take out the time points when leadership change take place. Then, we exclude the points marked as "regular change" in Archigos codes. For instance, China's transition from Jiang Zemin to Hu Jintao in 2002 cannot be treated as the end of a regime. Moreover, we count the "regular change" as regime change when it involves a transformation from nondemocratic institutions to democratic institutions. For example, the first time when Democratic Progressive Party won the presidential election in Taiwan is marked as the

end of an authoritarian regime. The independent variables are the count numbers of collective action. We use Cox survival model to conduct our analysis.

GDP growth rate and real GDP per capita has the positive effect of stabilizing authoritarian regimes. Many autocrats use modernization and the economic growth to justify regime legitimacy (Ross, 2012; Nathan, 2003). Citizens might be happier when their material needs are satisfied, ignoring social problems and unfairness (Whyte, 2010). Legislature helps autocrats to incorporate the opposite forces (Gandhi and Przeworski, 2007) and to generate government responsiveness (Malesky and Schuler, 2010). Urban concentration and ethnolinguistic fractionalization increase the complexity of the society, making it more difficult for the government to penetrate (Ross, 2012; Wallace, 2014). Other covariates include whether there is civil/international conflict, whether economic crisis takes place, and whether the observation is in the years of cold war.

4.2 Analysis

The first question is that how the frequency and the possibility of collective action are associated with different types of authoritarian regimes? By regressing the count number of collective action on regime types and other covariates, holding the effects of year and country as fixed, we find that elite-level collective action is more prevalent under military regimes and less common under monarchic regimes (personalistic regimes as the baseline). Holding all other covariates at their medians, Figure 2 show that being a military regime is expected to increase the frequency of elite-level collective action by 0.900 unit than being a monarchic regime. The logistic model provides similar results. The possibility of elite-level collective action is 12.91% higher under military regimes than under personalistic regimes, and 26.22% higher than under monarchic regimes, with all other covariates taking their medians (Figure 3). The results are consistent with our arguments in the previous section. Military regimes, lacking the institutions which facilitates information exchange among units, is incapable of holding their ruling coalition cohesive in a long-term period. Therefore, elite-level conflicts are more commonly seen under military dictatorships. By contrast, monarchic regimes provide a shared moral system that justifies the dominance of dictators. Elites have to overcome more institutional and ideational barriers when they seek to challenge incumbents. Therefore, elite-level collective action is less common under monarchic regimes.

Figure 2: Predicted Values of Elite-Level Collective Action (Negative Binomial Model)

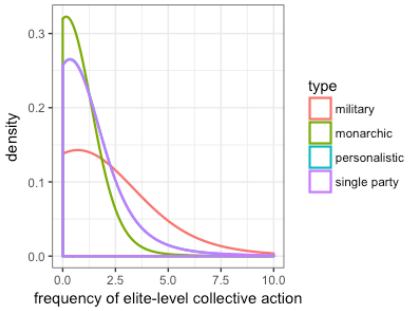
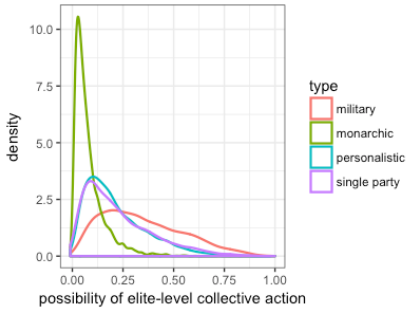
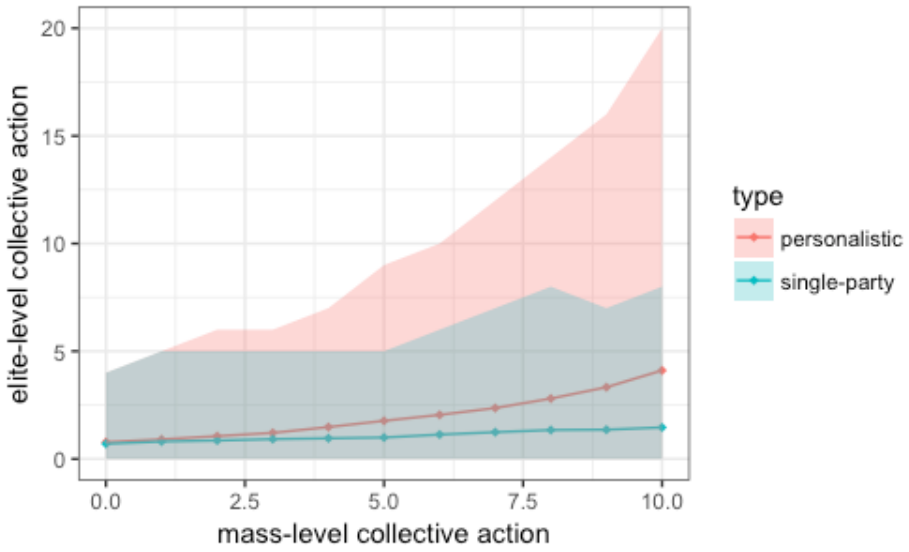


Figure 3: Expected Possibilities of Elite-Level Collective Action (Logistic Model)



When we assume the number of mass-level collective action is equal to zero (in Figure 1 and Figure 2), the possibility of elite-level collective action is similar under personalistic and single-party regimes. However, mass-level collective action could be translated into elite -level conflict under certain circumstances. By adding interaction terms between regime types and mass-level collective action, we discover that single-party regime is more capable of preventing the elite-level division when mass-level collective action takes place. Facing 10 times of mass-level social events, single-party regimes manage to reduce the number of elite-level collection action by 2.46 unit compared to personalistic regimes (Figure 4). Single-party autocrats stress the importance of party discipline. It protects the party from being torn apart by the rising of social forces. Incumbents can also use party discipline as the legitimate excuse to smash the opposite elite coups that supports the protestors. Moreover, well trained bureaucrats and clear hierarchical institutions mitigate the problems of incomplete information. Therefore, mass-level collective action is less likely to produce elite conflicts under single-party regimes.

Figure 4: Impacts of Mass-level Collective Action on Elite-level Collective Action



By comparison, when we assume the number of elite-level collective action is equal to zero, the results show that there is no substantial difference between the possibility of mass-level collective action across regime types. However, when the number of elite-level collective action increases, mass-level collective action become more likely. Autocrats' capacity of controlling the influence of mass-level collective action varies. Military regimes usually do a better job in preventing elite conflicts from eliciting more violent social disturbance. In monarchies, however, elite collective action could impact the society the directly once it happen. When witnessing 5 times of elite-level collective action, the masses living under monarchic regimes are launch give more contentious events than the ones living under monarchic regimes (Figure 5). Military regimes take advantage of its coercive apparatus to deter citizens. These methods prevent the grassroots from joining social movements even when they can see political disagreements at the elite level. Both Figure 5 and Figure 6 show that the spillover effect of elite-collective action is most severe under monarchic regimes. Monarchic usually lack the institution that keeps the conflict underground when elite crises break out. When the cohensions of elite class collapse, the society is constrained to make their own reponds.

Figure 5: Predicted Values of Mass-Level Collective Action (Negative Binomial Model)

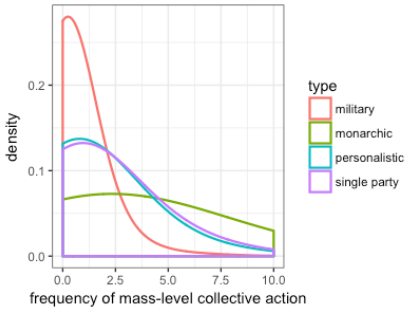
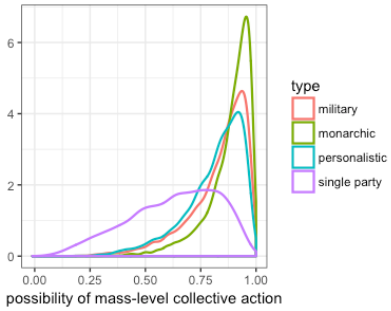
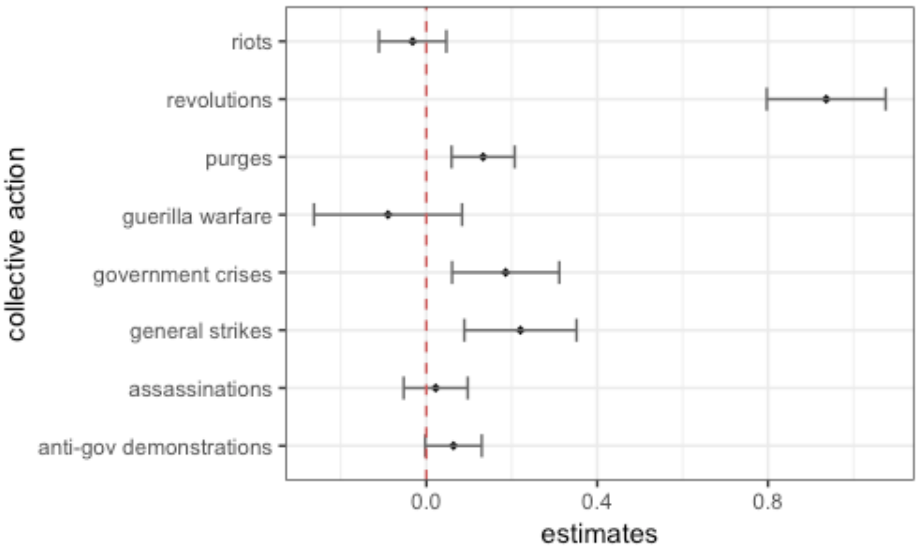


Figure 6: Expected Possibilities of Mass-Level Collective Action (Logistic Model)



Is collective action hazardous to authoritarian regime survival? In general, both elite-level and mass-level collective action do harm the stability of authoritarian regimes. Figure 7 shows that elite-level conflict, especially government crises and purges, leads to the quicker collapse of regimes. In a similar fashion, mass-level conflict, particularly strikes and revolutions, increases the harvard of regime collapse. Consistent with common wisdom, revolutions have destroying effects on the durability of authoritarian regimes. Meanwhile, the impact of everyday collective action cannot be ignored. Purge, government crises, general strikes could lead to the increased risk of collapse of 14.22%, 20.41%, and 24. 64% respectively.

Figure 7: Collective Action Harms the Survival of Authoritarian Regimes



The final question is, how does the threatening power of collective action vary across regime types? We regress regime duration on the count number of collective action in the datasets of

Table 3: Impacts of Collective Action on Regime Survival

	Military	**Single-Party**	**Monarchic**	**Personalist**
Elite-level Collective Action	0.085^{***}	0.348^{**}	0.312	0.234^{***}
	(0.022)	(0.168)	(0.316)	(0.073)
Mass-level Collective Action	-0.023	0.027	0.285^{***}	0.039^{*}
	(0.032)	(0.035)	(0.100)	(0.022)
Ethnolinguistic Fractionalization	0.490	-0.418	0.485	-0.088
	(0.700)	(0.830)	(2.106)	(0.428)
Economic Crisis	-0.458	-19.298^{***}	5.209^{**}	-0.451
	(0.648)	(0.685)	(2.348)	(0.380)
Cold War	1.133^{**}	-0.418	18.848^{***}	0.642
	(0.546)	(0.698)	(1.370)	(0.405)
Urban Concentration	1.291^{*}	2.555^{***}	4.558	-0.591
	(0.770)	(0.948)	(3.274)	(0.761)
Legislature	0.340	-0.798	1.227	-0.262
	(0.356)	(0.670)	(1.292)	(0.354)
Civil/Intl. Conflict	-0.192	0.014	0.859	0.392
	(0.363)	(0.500)	(1.182)	(0.306)
GDP Growth (%)	-5.214^{***}	-9.366^{***}	-2.700	-3.405^{***}
	(1.624)	(3.100)	(2.109)	(1.274)
Real GDP per Capita (logged)	0.00003	-0.0001^{*}	-0.0001	-0.0001^{*}
	(0.00005)	(0.0001)	(0.00005)	(0.0001)
Observations	306	1,071	328	813
Log Likelihood	-206.139	-63.489	-7.564	-208.925

Note: All models in this table are Cox Models. Positive coefficients reflect estimated effects that increase hazard rates of collapse. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

military regimes, monarchic regimes, single-party regimes, and personalist regimes separately. Table 2 shows that mass-level collective action significantly increases the risk of the collapse of monarchical regimes. The coefficient for 0.285 translates into an increased hazard of collapse by 32.98% with one unit of increasement in mass-level collective action. Elite-level collective action raises the expected risk of regime collapse by 8.8% under military dictatorship, 41.62% under single-party regimes, and 26.36% under personalist regimes. With the moral and kinship system linking the ruling class in cohention, monarchic rulers are less troubled by elite division. However, these networks also make him less connected with the outside world. Thus, the treats usually come from the social forces beyond the reach of the state. Under military regimes, the state power comes from the dominance of coercive forces. When the discontent coups challenge the military dominance of the incumbents, they simultaneously challenge the stability of regimes. The end of single-party and personalistic regimes is usually caused by the division among elites. The bargaining power of the society is limited. Compared to the masses, the elites are more capable of making a huge strike on the dominance of current leaders.

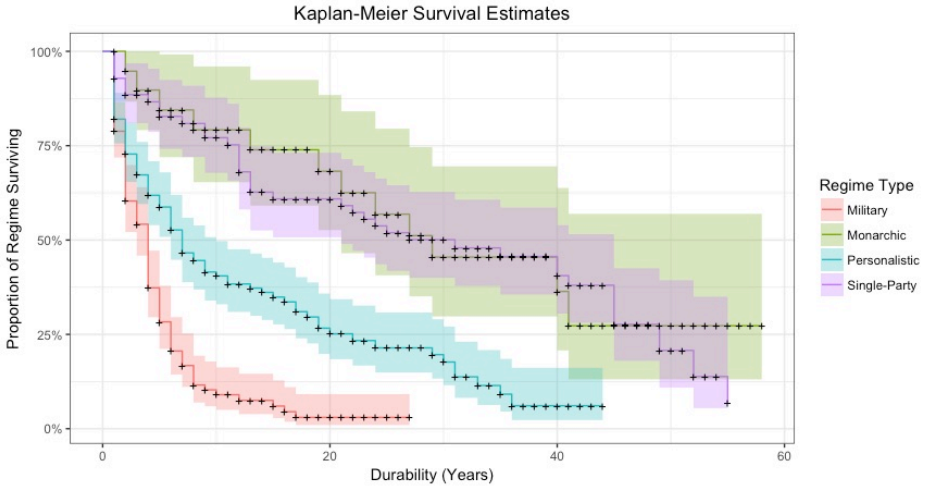
5 Conclusion

In conclusion, our study tells an interesting story about the durability of authoritarian regimes. We look into two aspects of collective action: when collective action is more likely to happen and how collective action impact the stability of different regimes. Based these explorations, we discover the pattern of endogenous regime change across different types of autocracies. Sometimes, dictators are capable of reducing the possibility of the collective action that is most threatening to regime durability. In other occasions, certain types of regimes trigger the collective action which directly harms the survival of themselves. The diversity of these patterns is summarized in Table 4.

Table 4: Endogenous Political Change

Regime Type	The Probability of Collective Action	The More Threatening Collective Action
Military	Elite (+)	Elite
Single-party	Elite (-)	Elite
Personalist	Elite (+)	Elite
Monarchic	Elite (-)	Mass

Figure 8: The Probability of Survival in Different Types of Authoritarian Regimes



Therefore, some types of authoritarian regimes tend to be more durable than other (Figure 8). Under military regimes, the autocrats faces the challenges of other coups more frequently. These elite-level collective action in turn increases the hazard of regime collapse. Therefore, military regimes is the most unsustainable regime types compared to the others. The propensity of collapse is endogenous to the creation of the regime.

Personalistic regimes are vulnerable to elite conflicts. It is less capable of controlling the amount of elite-evel collective action compared to single-party and monarchic regimes. The possibility of elite-level collective action is lower than the one under military regimes, as the ruling power comes from the charismatic leader not the cohesion of military coups. Thus, personalist regime is expected to be second short-live regimes.

Single-party regimes are more durable as it successfully control the type of collective action that is threatening to its survival. Putting more efforts in training bureaucrats and establishing

institutions, the possibility of elite-level conflicts in lower than the one under military regimes. Moreover, single-party regime have the capacity to limit the impact of mass-level collective action only at the grassroots level. The regime succeed in build a strong party that are unlikely to be torn apart by social movements.

Last but not the least, monarchic regimes are a special case, as it incorporates kinships and morality in the consolidation of power. Monarchic regimes manage to sustain themselves by indirectly avoiding the outbreak of mass-level collective action. Mass-level collective action is expected to pose threats on the survival of monarchic regime. From a comparative perspective, monarchic regime does not trigger more mass-level collective action directly. Though elite-level collective action is more likely to explicit mass-level collective action under monarchic regimes, the possibility of elite level collective action is inherently low. Therefore, by avoiding elite conflicts, monarchic regimes manage to avoid the occurrence of mass-level collective action.

References

Celestino, Mauricio Rivera, and Kristian Skrede Gleditsch. 2013. "Fresh carnations or all thorn, no rose? Nonviolent campaigns and transitions in autocracies." *Journal of Peace Research* 50 (3): 385–400.

Chenoweth, Erica, and Maria J Stephan. 2011. *Why Civil Resistance Works: The Strategic Logic of Nonviolent Conflict*. Columbia University Press.

Chomiak, Laryssa. 2011. "The Making of a Revolution in Tunisia." *Middle East Law and Governance* 3 (1-2): 68–83.

de Mesquita, Bruce Bueno, Alastair Smith, Randolph M Siverson, James D Morrow et al. 2005. "The Logic of Political Survival." *MIT Press Books* 1.

Dittmer, Lowell. 1990. "Patterns of Elite Strife and Succession in Chinese Politics." *The China Quarterly* 123: 405–430.

Ekiert, Grzegorz. 1996. *The State Against Society: Political Crises and Their Aftermath in East Central Europe*. Princeton University Press.

Evans, Peter B. 1995. *Embedded Autonomy*. Princeton University Press.

Gandhi, Jennifer. 2008. *Political Institutions Under Dictatorship*. Cambridge University Press New York.

Gandhi, Jennifer, and Adam Przeworski. 2007. "Authoritarian Institutions and the Survival of Autocrats." *Comparative Political Studies* 40 (11): 1279–1301.

Geddes, Barbara. 1999. "What Do We Know About Democratization After Twenty Years?" *Annual Review of Political Science* 2 (1): 115–144.

Goemans, Henk E, Kristian Skrede Gleditsch, and Giacomo Chiozza. 2009. "Introducing Archigos: A Dataset of Political Leaders." *Journal of Peace Research* 46 (2): 269–283.

Hayek, FA. 2007. "The Road to Serfdom: Text and Documents?the Definitive Edition (the Collected Works of FA Hayek, Volume 2)."

Herb, Michael. 1999. *All in the family: absolutism, revolution, and democracy in Middle Eastern monarchies*. SUNY Press.

Hsiao, Hsin-Huang Michael, and Hagen Koo. 1997. "The Middle Classes and Democratization." *Consolidating the Third Wave Democracies. Themes and Perspectives, Baltimore, London*: 312–333.

Kim, Sunhyuk. 2000. *The politics of Democratization in Korea: The Role of Civil Society*. University of Pittsburgh Pre.

King, Gary, Jennifer Pan, and Margaret E Roberts. 2013. "How Censorship in China Allows Government Criticism But Silences Collective Expression." *American Political Science Review* 107 (2): 326–343.

Konrád, György, and Ivan Szelenyi. 1979. *The Intellectuals on the Road to Class Power*. Harcourt.

Koo, Hagen. 1993. *State and Society in Contemporary Korea*. Cornell University Press.

Kotz, David, and Fred Weir. 2013. *Revolution From Above: the Demise of the Soviet System*. Routledge.

Kuran, Timur. 1991. "Now Out Of Never: The Element of Surprise in the East European Revolution of 1989." *World politics* 44 (1): 7–48.

Levitsky, Steven, and Lucan A Way. 2010. *Competitive Authoritarianism: Hybrid Regimes After the Cold War*. Cambridge University Press.

Levitsky, Steven R, and Lucan A Way. 2012. "Beyond Patronage: Violent Struggle, Ruling Party Cohesion, and Authoritarian Durability." *Perspectives on Politics* 10 (4): 869–889.

Magaloni, Beatriz. 2008. "Credible Power-sharing and the Longevity of Authoritarian Rule." *Comparative Political Studies* 41 (4-5): 715–741.

Magaloni, Beatriz, and Jeremy Wallace. 2008. "Citizen loyalty, mass protest and authoritarian survival." In *Conference on Dictatorships: Their Governance and Social Consequences, Princeton University*.

Malesky, Edmund, and Paul Schuler. 2010. "Nodding or Needling: Analyzing Delegate Responsiveness in an Authoritarian Parliament." *American Political Science Review* 104 (3): 482–502.

Migdal, Joel Samuel, Atul Kohli, and Vivienne Shue. 1994. *State Power and Social Forces: Domination and Transformation in the Third World*. Cambridge University Press.

Nathan, Andrew J. 2003. "Authoritarian Resilience." *Journal of Democracy* 14 (1): 6–17.

Ross, Michael L. 2012. *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations*. Princeton University Press.

Scott, James C. 1998. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. Yale University Press.

Shue, Vivienne. 1990. *The Reach of the State: Sketches of the Chinese Body Politic*. Stanford University Press.

Svolik, Milan W. 2009. "Power Sharing and Leadership Dynamics in Authoritarian Regimes." *American Journal of Political Science* 53 (2): 477–494.

Svolik, Milan W. 2012. *The Politics of Authoritarian Rule*. Cambridge University Press.

Teorell, Jan. 2010. *Determinants of Democratization: Explaining Regime Change in the World, 1972–2006*. Cambridge University Press.

Tsai, Lily L. 2007. *Accountability Without Democracy: Solidary Groups and Public Goods Provision in Rural China*. Cambridge University Press.

Ulfelder, Jay. 2005. "Contentious Collective Action and the Breakdown of Authoritarian Regimes." *International Political Science Review* 26 (3): 311–334.

Wallace, Jeremy. 2014. *Cities and Stability: Urbanization, Redistribution, and Regime Survival in China*. Oxford University Press.

Wang, Yuhua. 2017. "Sons and Lovers: Political Stability in China and Europe before the Great Divergence.".

Whyte, Martin King. 2010. *One Country, Two Societies: Rural-urban Inequality in Contemporary China*. Vol. 16 Harvard University Press.

A LASSO Procedure, Multiple Imputation, and Data Missingness

Our group identified two major areas of improvement in Wallace's statistical procedures. First, we were not convinced by his parsimonious selection of covariates. Though theory driven, we believed it likely that additional factors influenced the likelihood of collective action events and regime durability. Wallace relies on four data sets to conduct his analysis, with each containing ≈ 300 variables. Given the amount of additional data collected, we believe that a LASSO-procedure can help identify additional covariates of interest. To carry out this procedure, we first trimmed the data sets down to only integer or numeric valued columns. Then, we cut all covariate columns where the proportion of NA values was greater than 70% for the data set 'dta_2a', and greater than 10% for the Banks data set (the two data sets used to create Table 1 in his paper). This was a researcher choice, chosen to maximize the number of variables under consideration whilst not preventing the code from running (errors occurred at certain thresholds). The matrices were further restricted to only include columns with the DV of interest (either `eventdummy`, `nevent`, `banksdummy`, or `banksconflict0`). Finally, we used the glmnet package to run a cross-validation procedure to select a lambda (chosen to be one standard error above the minimum), and then ran the LASSO-procedure using this selected lambda. Non-zero covariates were identified, and his analyses in Table 1 were re-run with their inclusion.

Secondly, we noticed a high degree of missingness in his data. The exact degree of missingness in 'dta2a' and the Banks dataset can be intuited from the missingness plots presented in this appendix. At best, about two-thirds of the observations were used, and at worst, only one-third. To improve upon this, we implemented a multiple imputation procedure. Using the mice package in `R`, we imputed data five times in each of the two matrices used to create Table 1, for a total of ten data sets. The models were re-run on each of the multiply-imputed data sets, with the LASSO-identified variables included. The implementation of this was straightforward, using the `mice()`, `with()`, and `pool()` functions, and `md.pairs()` to create the missingness tables.

Much thought was given to the order that LASSO and multiple implementation was carried out. We ultimately chose to first apply a LASSO procedure on data that existed, and then impute data, including the identified covariates. We felt that using the LASSO after multiply-imputing the data would result in LASSO selecting on data that did not actually exist. We believed this to be

more methodologically sound. The alternative option would have been for us to multiply-impute the data sets, run LASSO on each of them, and then only retain covariates that were identified greater than a certain percentage of the time (perhaps, one-half).

Finally, we did not replicate the Cox proportional hazards models in the latter part of his paper. From our self-study, this seems to be an unresolved issue when doing multiple-imputation in `R`. Comments on how to implement this would be warmly welcomed.

Figure A.1: Data Missingness in Model 1.1 and Model 1.2

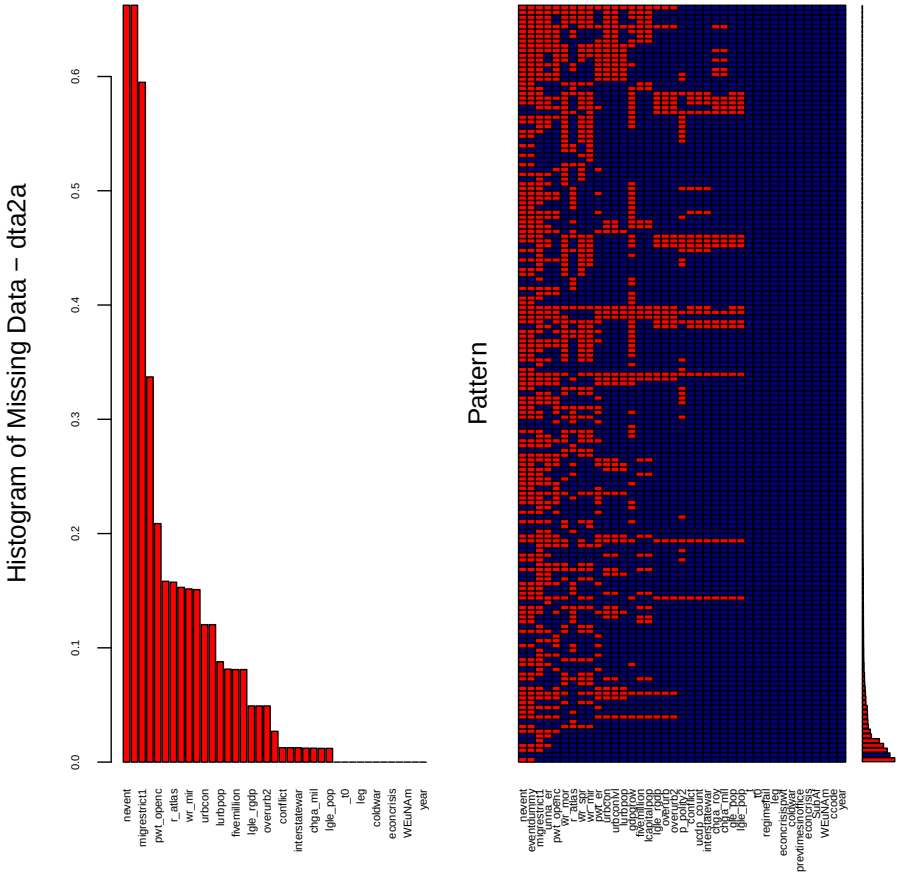
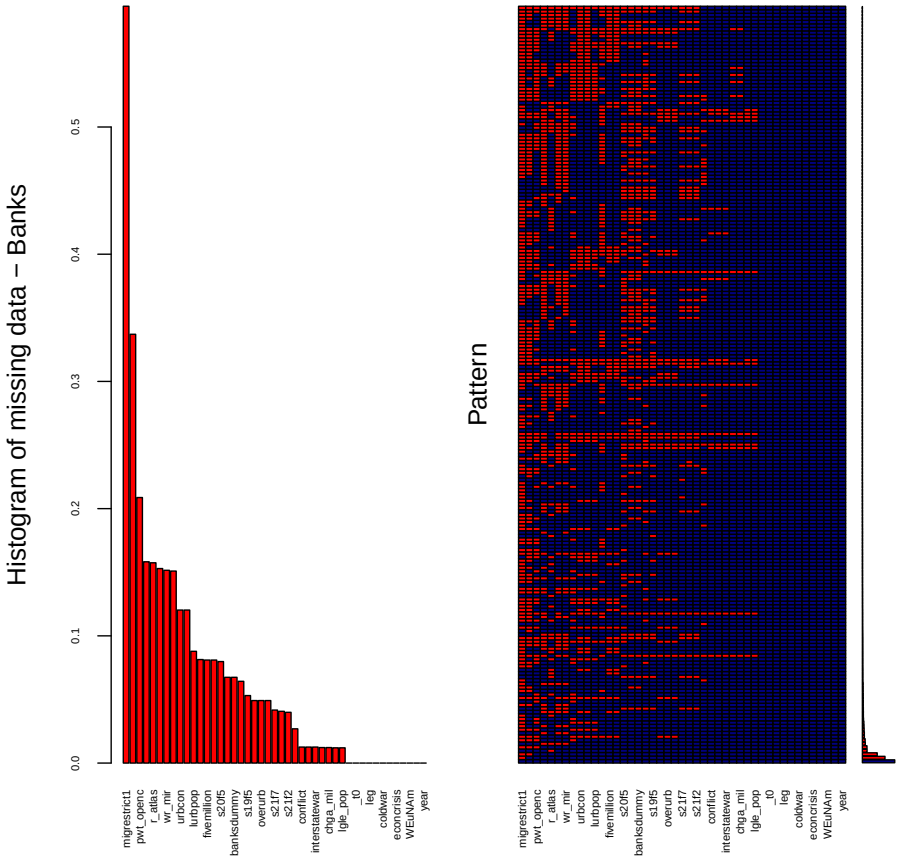


Figure A.2: Data Missingness in Model 1.3 and Model 1.4



B Regime Types Affect Different Types of Collective Action

Table A.1: Regime Types Affect Elite-Level Collective Action

	Negative Binomial	**Logistic**
Military Regime	0.443***	0.752**
	(0.167)	(0.326)
Monarchic Regime	−0.960***	−1.265***
	(0.277)	(0.427)
Single-Party Regime	−0.077	0.045
	(0.227)	(0.361)
Mass-level Collective Action	0.164***	
	(0.010)	
Mass-level Collective Action Dummy		1.521***
		(0.158)
GDP Growth (%)	−1.774***	−1.816***
	(0.416)	(0.582)
Real GDP per Capita (logged)	−0.00003	−0.00003
	(0.00002)	(0.00003)
Urban Concentration	1.773***	3.181***
	(0.615)	(0.917)
Ethnolinguistic Fractionalization	1.132	5.744
	(3.309)	(4.254)
Civil/Intl. Conflict	0.640***	0.568***
	(0.093)	(0.145)
Legislature	−0.409***	−0.270
	(0.136)	(0.199)
Cold War		2.373***
		(0.769)
Economic Crisis	0.083	0.319
	(0.157)	(0.233)
Military Regime*Mass-level Collective Action	−0.010	
	(0.022)	
Monarchic Regime*Mass-level Collective Action	−0.010	
	(0.023)	
Single-Party Regime*Mass-level Collective Action	−0.095***	
	(0.015)	
Military Regime*Mass-level Collective Action Dummy		−0.245
		(0.353)
Monarchic Regime*Mass-level Collective Action Dummy		0.357
		(0.385)
Single-Party Regime*Mass-level Collective Action Dummy		−0.315
		(0.259)
Constant	−1.553	−7.899**
	(2.379)	(3.143)
Observations	3,322	3,322

Note: *** p < 0.01, ** p < 0.05, * p < 0.1.

Table A.2: Regime Types Affect The Probability of Mass-Level Collective Actions

	Negative Binomial	**Logistic**
Military Regime	0.281*	−0.068
	(0.155)	(0.286)
Monarchic Regime	0.056	−0.487
	(0.275)	(0.402)
Single-Party Regime	0.017	0.309
	(0.199)	(0.314)
Elite-level Collective Action	0.358***	
	(0.025)	
Elite-level Collective Action Dummy		1.360***
		(0.156)
GDP Growth (%)	−0.798**	−1.244**
	(0.374)	(0.566)
Real GDP per Capita (logged)	0.00001	−0.00002
	(0.00002)	(0.00003)
Urban Concentration	1.480**	0.829
	(0.633)	(0.907)
Ethnolinguistic Fractionalization	−0.723	−8.329**
	(2.968)	(3.986)
Civil/Intl. Conflict	0.389***	0.986***
	(0.086)	(0.133)
Legislature	0.236*	−0.055
	(0.124)	(0.189)
Cold War	−0.609	−0.568
	(0.458)	(0.662)
Economic Crisis	0.231	0.142
	(0.147)	(0.230)
Military Regime*Elite-level Collective Action	−0.272***	
	(0.031)	
Monarchic Regime*Elite-level Collective Action	0.245***	
	(0.072)	
Single-Party Regime*Elite-level Collective Action	0.044	
	(0.049)	
Military Regime*Elite-level Collective Action Dummy		0.259
		(0.359)
Monarchic Regime*Elite-level Collective Action Dummy		1.129***
		(0.401)
Single-Party Regime*Elite-level Collective Action Dummy		−0.170
		(0.251)
Constant	−1.063	5.130*
	(2.168)	(2.958)
Observations	3,322	3,322

Note: *** p < 0.01, ** p < 0.05, * p < 0.1.