On the Determinants of Riots, Coups and Civil Wars: The Effect of Youth Bulges

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Abstract

This paper investigates the relationship between domestic political conflict and youth bulges in economically stagnant societies. Considering the growing debate on population pressures and resource scarcity, their combined effect, I would argue, will likely increase the risk of violence. In this context, this paper estimates the heterogenous economic effect of large young cohorts on the likelihood of riots, coups and civil wars. Using panel data on conflict, polity and demographic and economic characteristics, this paper's contribution is twofold. First, is to estimate the effect of youth bulges on political violence, where the latter is modelled as a continuum process (in terms of scale) covering riots, coups and civil wars. Second, I assess the extent to which the impact of youth bulges on political violence might depend on the level of youth unemployment and education. I find robust positive effect of youth bulges on the different forms of political violence, where the effect was found to be non-monotonic in the case of civil wars. Furthermore, the effect of youth bulges substantially hinges on high youth unemployment and education.

1. Introduction

Studying the impact of youth bulges on conflict started in the 1960's (Moller, 1968), while gaining much of interest during the past two decades in light of the recent debate on population pressures and resource scarcity[1]. The youth bulge phenomenon under certain circumstances is statistically associated with political unrest, as the percentage of a young population (relative to adults) rises the probability of intra-state conflict increases (Goldstone, 2002). During the period between 1946 to 2016 the world has witnessed a total of 2,452 internal conflict events: precisely 1,897 riots, 329 coup attempts, and 226 civil wars[2]. Compellingly, countries with higher youth bulges at the 80th percentile (youth bulges of 33-34%) had witnessed the most of such events; 272 riots, coups and civil wars (see table 1). Conflict theorists have linked persistant economic hardships and youth bulges with political violence[3]. Collier & Hoeffler (2004) and Huntington (1993) state that the activity of most fundamentalist movements is sustained by young and educated individuals seeking scarce opportunities to join a particular social elite. Therefore, as the percentage of young individuals increase, in countries suffering from economic stagnation and political dissolution, the likelihood of political violence also increases.

Table 1 Youth Bulges and Political Violence

Percentiles	Youth Bulges	Civil Wars	Coups	Riots	Total Incidences of Violence
10	10-18%	10	3	217	230
20	18-21%	11	4	171	186
30	21-25%	9	16	187	212
40	25-29%	18	13	199	230
50	29-31%	18	35	191	244
60	31-32%	17	47	187	251
70	32-33%	28	51	177	256
80	33-34%	37	67	166	270
90	34-36%	42	64	139	245
100	36-44%	17	20	124	161

The youth bulge phenomenon received worldwide political and economic attention, yet only few relevant empirical work has been done on the topic. Collier & Hoeffler (1998) and (2004) are notable examples of quantitative studies addressing youth bulges. They found no such connection between large young cohorts and internal conflict. Primarily due to an underestimated measure of the youth bulge. Other empirical work by Urdal (2006) present a positive impact of large young cohorts on civil conflict onset, but overlooks the determinants of coup attempts and riots. Conspicuously, no empirical research has studied large young cohorts as a common determinant of different types of internal conflict. This paper helps explain the influence of youth bulges on political violence and whether large young cohorts is a common determinant of different types of

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[1] See Urdal (2004) and (2006) (2006), Barakat & Urdal (2009), Yair & Miodownik (2016) for cross-country analysis; and Murshed & Gates (2005), Do & Iyer (2010), and Macours (2011) for country-level survey analysis.
[2] See Gleditsch et al. (2002), Banks & Wilson (2018), and Powell & Thyne (2011).
[3] See Moller (1968), Choucri (1974), Kaplan (1994), and Huntington (1993).

political violence. The novelty of this paper is to probe deeper to examine the role of youth unemployment and education as a channel for explaining the effect of youth bulges.

The literature on political violence focuses on understanding the causes of civil wars exclusively. Recent evidence, however, suggest that such approch overlooks the integrative impact of lower levels of political violence on civil wars (Bodea, Elbadawi, & Houle, 2017). Comparable research by Fearon & Laitin (2003) and Fearon (2004), explain civil wars as a result of incessant compilations of past internal conflicts and that coup attempts and minor insurgencies are straetgies employed in regime change schemes. Concurrently, in this paper I argue that popular discontent (such as riots) and leadership survival dynamics (such as coup attempts) are overlappingly interrelated with civil wars in countries with large young cohorts. In this paper I investigate the effect of youth bulges on the likelihood of political violence in 159 countries over the period from 1992 to 2016, asking the question as to whether youth bulges do influence political violence, and what role if any does youth education and unemployment play in this association.

The following section summarizes some of the main findings in the literature and explicates the conceptual framework of the paper. Section 3 will define the different outcomes of political violence and section 4 will explain the research design, the paper's empirical approach, and the data used in the analysis. Followed by the results and robustness checks in sections 5 and 6, and concluding with policy implications and further research recommendations in section 7.

2. Conceptual Framework

Common determinants of internal conflict was first presented by Gurr (1970), in postcolonial states in Africa and Southeast Asia. Gurr argues that different forms of political violence share three main contributing factors: the people's belief in the legitimacy of the state and the political system, popular discontent, and the effectiveness of ruling regimes in channeling or repressing such discontent. Gurr's theory of "*collective political violence*" maintains that social, economic, and/or political circumstances may be confered as common causes of different forms of political violence.

Building on the theoretical model by Gurr (1970); Bodea et al. (2017) suggest that various types of political violence are related and interwine under certain circumstances. They find that factional partial democracies and ethnic exclusion from power are common determinants of riots, coups, and civil wars. They also add that when designing ruling coalitions and deciding on the number of ethnic groups included in power, heads of state face a trade-off between increasing or decreasing the chances of coup d'etat and civil wars interchangeably. Research by Powell (2014) suggests that attempts to eliminate one type of internal conflict can lead to increasing the likelihood of another. Powell argues that "coup-proofing" strategies such as inducing ethnic and/or political fractionalization and abating military capacity, brings about highly unstable political institutions and therefore lead to potentially civil wars.

During episodes of economic stagnation and high youth unemployment, countries with considerable youth bulges, are more susceptible to internal conflict as the opportunity cost of joining a rebellion declines. Research on youth bulges and conflict can be conveniently catalogued into two sub-categories: economic causes "greed" and social or ethnic motives "grievances". Collier (2000) holds that during economic hardships, the the opportunity cost of recruiting young

men to join armed conflicts is quite low, leading to higher chances of civil wars. A well educated youth bulge enjoying higher income-earning opportunities, generally reduce the incentive to join armed conflicts. Correspondingly, Brett & Specht (2004) find strong evidence that poverty along with low levels of schooling and fewer opportunities for economic migration, are major causes of joining a rebel group.

Ensuing Gurr's theory, I pose that different forms of internal violence are indeed complementary to- and analogous of- each other. It is therefore valuable to investigate the underlying common factors leading to such outcomes. Using a multinomial logit specification and applying heterogeneity analysis, I aim to identify the channels through which youth bulges are commonly associated with different forms of political violence.

Investigating whether youth bulges are common determinants of different forms of political conflict remains a lacuna in the conflict literature. Previous research looked at the nature of the relationship between large young cohorts and conflict. Huntington (1993) finds that youth bulges have a non-monotonic effect on the likelihood of armed civil conflict. Huntington further estimates the threshhold at which youth bulges maximize the probability of conflict at 20% of total population. Indeed, empirical evidence from Urdal (2004) and (2006) suggest strong evidence of a non-linear relationship between youth bulges and civil wars. Urdal in both papers argues that youth bulges in countries with low economic growth levels are associated with higher likelihoods of civil war onset. He concludes that using a more relevant measure of economic hardship to young cohorts, such as youth unemployment, would provide a more compelling explanation of why youth bulges increase the chances of civil wars.

The association of large young cohorts and civil wars have been contested in the literature. Theoritical studies by Goldstone (1991) and (2010) and empirical evidence presented by Urdal (2006) and Collier, Hoeffler, & Rohner (2009) support the hypothesis of a positive association between youth bulges and civil conflict. Work by Fearon (2011) and Sommers (2011) on the other hand, defies the existence of such a relationship. For this paper and building on theories from Goldstone (1991), (2002) and (2010), I posit that youth bulges increase the likelihood of political violence. In a sociaety that suffers from high unemployement, as the percentage of young and educated individuals increase, the likelihood of political violence also increases. Rapid growth of a young and educated population competing for scarce opportunities, as well as social and ethnic imbalances, tend to increase the chances of violent conflict (Goldstone, 2002). Furthermore, the positive effect of youth bulges on civil conflict particularly rises in societies ruled by weak institutions and suffering economic hardships (Urdal, 2006).

3. Defining Riots, Coups, and Civil Wars

The definition of riots, civil wars, and coups could not be more contended in the literature – generating both theoritical and emperical debate. Goldstone et al. (2010) uses qualitative definitions based on the political outcomes of such events, while Gates et al. (2006) estimate quantitative measures of the casualties involved and the change in polity score. For the purpose of this paper, I will use some of the most cited approaches to define and count such events, with the aid of different data sets (Banks & Wilson, 2018; Gleditsch, Wallensteen, Eriksson, Sollenberg, & Strand, 2002; Powell & Thyne, 2011).

Riots are defined as potent demonstrations caused by political or social grievances, riots maybe catalougued or random in nature between different parties (civil or otherwise). Unlike coups and civil wars, riots are often characterized with mass public participation and the fewest casualties. A long history of riots, even if aimed at societal gains, can have severe political and economic consequences. The world in the 1960's had witnessed a great deal of such events: dominantly-the civil rights movement in the US , labor strikes in France, and riots in the Middle East and Latin America. Riots can be a direct cause of forced migration, growth hindrance, and may lead to civil wars and coups (Horowitz, 2001). Estimating the determinants of riots in my model allows to test for the relationship between youth bulges and popular discontent. I also attempt to explain the role of a long history of riots play in determining other forms of political violence (coups or civil wars).

Civil wars are defined as sizable domestic armed conflicts between state and "organized" non-state players for the sake of taking control of government, a geographic region, or to try and influence policies (Fearon & Laitin, 2003). Civil wars are not often aimed at changing the head of state, and involve a great deal of casualties. Domestic armed conflicts are often sustained over longer periods of time compared to coups and riots. Coup d'etat, on the other hand, is a sudden political change at the governing body's chief executive level to depose the head of state. Often illegally executed by armed personnel (the state's army, police forces, or others) and at times with the cooperation of the state's political and/or economic elite (Powell & Thyne, 2011). Based on the theoretical background by Morrison & Stevenson (1971), coups may not necessarily involve casualties, however, they do involve force or at least the threat of force. In contrast to riots, coups do not involve public participation.

Riots, coups and civil wars are often associated with political unrest and is unanimously agreed upon as an appropriate measure of instability[4]. Table 2 shows a pair-wise correlation matrix between riots, coups, civil wars, the Polity2 score, and a binary measure of transitional and interregnum regimes. Research by Belkin and Schofer 2003 and Acemoglu, et.al. 2010 associate coup d'etat attempts with onset of civil wars. Further supporting the hypothesis that coup-proofing strategies where weak governments attempt to influence prennial domestic armed conflicts, in order to prevent a strong military institution from seizing power.

Table 2 Significant correlation between Conflict Outcomes

	Riots	Coups	Civil war onset	Polity2
Coups	0.0431***			
Civil war onset	0.0895***	0.1557***		
Polity2	0.0806***	-0.1010***	-0.0422***	
Transitional and interregnum regimes	0.0819***	0.0986***	0.1247***	-0.0087

4. Empirical Framework for Youth Bulges and Conflict

The sample used contains 5,414 observations extending over the period between 1992-2016 and covers 159 countries. Table 2 lists the groups of controls used in the model as well as the sources of the data and summary statistics.

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[4] See Goemans (2008), Goldstone et al. (2010) and Smith (2004).

Table 3 Summary Statistics

	Variables	Source	Mean	Std. Dev.	Min	Max
Dependent variable	Riots	Banks (2016)	0.200	0.400	0	1
	Coups	Powell & Thyne (2011)	0.030	0.171	0	1
	Civil wars	Armed Conflict (PRIO)	0.024	0.154	0	1
Endogeneity controls	Years since the last war	Armed Conflict – PRIO	24.258	21.495	0	70
	Riots past 5 years	Banks (2016)	1.916	5.342	0	90
	Coup attempt in the past 5 years	Powell & Thyne (2011)	0.096	0.295	0	1
Opportunity cost of conflict	Youth bulge	U.S. Census Bureau	27.101	8.174	10.777	41.597
	Uni. and sec. enrollment (1000)	Banks (2016)	72,297	237,911	34	2,873,565
	Youth unemployment	WDI	17.303	12.248	0.306	65.700
	GDP per capita growth	WDI	2.204	6.462	-62.225	140.501
	Rent to GDP	WDI	0.085	0.121	0	0.826
	Natural log of population	WDI	16.095	1.542	12.707	21.060
Political institutions	Polity	Marshall et al. (2010)	3.642	6.382	-10	10
	Trans. / inter. regimes	Marshall et al. (2010)	0.025	0.155	0	1

The model used is a multinomial logit estimation of the log probability of onset of the three types of political conflict, relative to the reference group (countries at peace). The three types of conflict onset in the model are separately identified using 3 different data sets (Banks & Wilson, 2018; Gleditsch et al., 2002; Powell & Thyne, 2011). Controlling for the number of peace years and the history of riots and coup attempts is quite practical in order to eliminate potential endogeneity bias within the model specification (Bodea et al., 2017; Goldstone et al., 2010). A recent history of popular discontent was found to be a consistent determinant of both civil wars and coups (Goemans, 2008; Smith, 2004). Therefore the model in this paper controls for the number of riots in the past 5 years. The model also contains regional and half-decadal dummies to control for various regional externalities as well as potential time-varying biases.

Measuring the Dependent Variables

Civil wars are coded using the Prio/Uppsala dataset, which identifies a civil war conflict when it records a minimum of 25. Additionally, a civil war onset is considered new, if it takes place two years after the previous conflict. This approach helps take into account the occurrence of preceeding smaller scale conflicts (Ross, 2012). As for coup d'etat (successful or not), Powell & Thyne (2011) argue to not count "plotted and alleged coups" as they are often misrepresented by governments to legitimize consequential political repression and harsh reforms. Not to mention that alleged coup attempts data sources can be unreliable. Riots data on the other hand is obtained from the Banks Cross National Time Series. Where a riot is defined as the event at which 100 participants or more engage in a violent demonstration involving physical force.

When constructing the categorical dependent variable, the value of zero is assigned to countries at peace (used as the referrence group). In this model, civil wars are considered the most critical form of political violence, followed by coups then riots. The implications of this assumption are important for the operationalization of the data. The reasoning for such operationalization is as

follows: first, civil wars involve the most casualties amongst all three possible outcomes, and generally occur over longer periods of time compared to riots or coups. Second, coup attempts are considered a more critical instability outcome than riots as they involve the change of the executive at the highest level in a state. Subsequently, for countries that have witnessed more than one of the three events in a single year, the highest instability outcome is assigned to that particular country for that year. For example Venezuela experienced both a coup attempt and a riot in 2002, as well as Burundi in 2015. For those two cases a coup attempt coding instead of riots is assigned. Ukraine in 2014 on the other hand, has experienced all 3 forms of conflict in that case a civil war coding is assigned instead of riots or coup detat. In addition, Powell & Thyne (2011) identify 38 of the civil conflict events in the PRIO dataset. To avoid such events are eliminated from the civil war dataset[5].

Youth Bulges and Political Institutions

Youth bulge is calculated following Urdal's (2004) definition, where the total population between 15-24 is divided by the total population above 15, instead of total population, in contrast to Collier (2000). The rationale behind such operationalization is to limit the potential bias stemming from countries with high fertility rates, countries with a relatively large population under the age of 15.

To account for the effect of political institutions and regime types the Polity2 data set is used in this model. Using the Polity2 data set however, has been critised in the political science literature for measurement errors. Cheibub, Gandhi, & Vreeland (2010) find that different measures of democracy are not interchangeable when replicating studies published in leading journals. Furthermore, Treier & Jackman (2008) find considerable measurement errors in modelling democracy as a latent variable using the Polity2 data set. Hence concluding that democracy measures using the Polity2 data set could potentially produce misleading results when used as a covariate in cross-country analysis. To check for the robustness of the results in the paper an alternative measurement of polity is included using the Varieties of Democracy (V-Dem) data set developed by Coppedge et al. (2018).

Model Specification

A multinomial logistic regression (see equation 1) uses a linear prediction function to estimate the log probability of occurrence of different outcomes in a categoricaly defined dependent variable relative to a reference group. This is reffered to as the log of the odds ratio. In this case intra-state political violence is coded as one variable using the previously mentioned method with 3 possible outcomes, and countries at peace as the reference group.

$$f(k,i,t) = \alpha_{i,k} + \beta_{1,k} youth_{it} + \beta_{2,k} youth_{it}^2 + \beta_{3,k} X_{it} + \eta_i + \upsilon_t + \varepsilon_{it} \tag{1}$$

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[5] The list of coup events identified by Powell & Thyne (2011) as miscoded internal conflict events in the PRIO and COW dataset can be found at: http://www.uky.edu/~clthyn2/coup_data/home.htm

Where $\beta_{M,k}$ is the regression coefficient corresponding to the Mth independent variable and the kth political conflict outcome (riots, coups or civil wars). $youth_{it}$ is a variable measuring the ratio of the population between the ages of 15-24 to the population above 15. $youth_{it}^2$ is the square term of youth bulges measuring the non-monotonic relationship between large young cohorts and conflict[6]. X_{it} is the set of covariates measuring the endogeneity controls, opportunity cost of conflict, and political institutions. While η_i and υ_t represent regional and half-decadal dummies, respectively.

The raw coefficients of the multinomial logit represent the relative log odds ratio of each conflict outcome (i.e. riots, coups or civil wars). Equation (2) below illustrates how the log odds ratio are calculated for each outcome using Newton –Raphson maximum likelihood estimator, where a one unit increase/decrease in one variable would be associated with β units increase/decrease in the relative log odds of the kth conflict outcome to the refernce gourp (Greene, 2002):

$$ln\left(\frac{P(outcome=conflict_k)}{P(outcome=peace)}\right) = \alpha_{i,k} + \beta_{1,k}youth_{it} + \beta_{2,k}youth_{it}^2 + \beta_{3,k}X_{it} + \eta_i + \upsilon_t + \varepsilon_{it} \qquad (2)$$

Using the same multinomial logit specification, the model in equation (1) is extended to control for education and an interaction term between education and youth bulges. The variable used to control for education is the total number of enrollments in secondary school and university level in thousands of students. The extended specification helps clarify two important drivers through which young people are associated with political violence, that is youth unemployment and youth education. Furthermore, heterogeneity analysis of the youth bulge model in equation (1), is done by splitting the sample in to two groups: countries ranked at the highest and lowest 20th percentile of youth unemployment.

5. Results

Table 4 below shows the results of the baseline model for riots, coups and civil wars. In congruity with Horowitz (2001), the model in table 4 resolutes evidence that a recent history of riots (during the past 5 years) increases the chances of all three forms of political violence. Likewise per capita GDP growth, a proxy for economic prosperity, reduces the chance of all the forms of political violence. In light of the coup-proofing strategies discussed earlier, the coefficient on the number of peace years (a proxy for the state's military experience) behave as expected, reducing the log likelihood of experiencing coup attempts. The baseline model results in table 4 estimate a negative linear association between natural resource rents and riots. This is in line with Gurr's (1970) hypothesis, where natural resource rents can be used in wealth redistribution to mitigate popular political discontent and ultimately reduce riots. As for civil wars, the coefficient on resource rents

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[6] I also added a cubic term to the model to check for the existence of additional polynomial orders of youth bulges. However, no significant relationship was found.

exhibits a non-monotonic inverted U-shape relationship similar to what other studies found. However, the model seems to predict no significant relationship between rents and coups.

Table 4 Multinomial Logit: Baseline Model

	Baseline Model		
	Riots	Coup attempts	Civil wars
Years since the last war	-0.00370	-0.0400***	0.00324
	(0.00255)	(0.00967)	(0.00647)
Number of riots in the past 5 years	0.0917***	0.0593***	0.0624***
	(0.0150)	(0.0195)	(0.0169)
Coup attempt in the past 5 years	-0.313*	1.227***	0.109
	(0.172)	(0.214)	(0.315)
GDP per capita growth (annual %)	-0.0444***	-0.0627***	-0.0469***
	(0.0112)	(0.0132)	(0.0174)
Lagged rents to GDP	-1.741*	-2.091	5.518**
	(1.049)	(2.039)	(2.268)
Lagged rents to GDP square	2.159	0.527	-8.401**
	(1.971)	(4.076)	(4.119)
Natural log of population	0.427***	0.108	0.234***
	(0.0362)	(0.0745)	(0.0687)
Lagged Polity2	0.00661	-0.00530	0.00200
	(0.00881)	(0.0188)	(0.0216)
Lagged Polity2 square	-0.00702***	-0.0135***	-0.0125***
	(0.00171)	(0.00361)	(0.00363)
Transitional and interregnum regimes	1.125***	0.508	1.242***
	(0.271)	(0.446)	(0.414)
Constant	-7.778***	-4.520***	-7.849***
	(0.652)	(1.444)	(1.298)
5-year dummies		Yes	
Regional dummies		Yes	
N		5414	

Robust standard errors in parentheses
$^{+} p < 0.11, ^{*} p < 0.10, ^{**} p < 0.05, ^{***} p < 0.01$

The results on polity, measured using the Polity2 index as well as a binary variable for transitional and interregnum regimes, are also in congruency with other findings in the literature. The model estimates a non-monotonic relationship between polity and civil wars. The coefficient corresponding to transitional and interregnum regimes, on the other hand, is esimated to have a significantly positive effect on the log likelihood of riots and civil wars similar to the results found by Gates et al. (2006). Where perpetual regime change and transitional regimes are also strong predictors of different forms of political violence.

The Youth Bulge

Table 5 below shows multinomial logit regressions results of the impact of youth bulges as measured by Urdal (2004) on riots, coups and civil wars. Testing for both Huntington's (1993) claim of a quadratic relationship between youth bulges and conflict as well as Urdal's hypothesis of a strictly linear association. The model results show that youth bulges have both a significantly linear and a non-monotonic relationship with civil wars and coups. Given the model specification

in table 5, the estimates do not show a significant relationship between youth bulges and riots. The coefficients of multinomial logit models are estimated log likelikoohds of the outcomes. Exponentiating the coefficient of 0.077 on civil wars (significant at the 1% level) in the *Youth Bulge* panel, gives the value of 1.08. Thus, a 1 percent increase in the youth bulge is associated with increasing the log odds ratio of civil war onset by 8.0% relative to countries in peace.

*Table 5 Multinomial Logit: Introducing Youth Bulges*

	Youth bulge			Youth bulge square		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % of pop. above 15	0.00147	-0.00323	0.0773***	-0.0275	0.591***	0.402***
	(0.0102)	(0.0265)	(0.0251)	(0.0552)	(0.228)	(0.148)
Youth bulge square				0.000536	-0.00973***	-0.00557**
				(0.000994)	(0.00354)	(0.00240)
Years since the last war	-0.00358	-0.0401***	0.00710	-0.00375	-0.0403***	0.00790
	(0.00265)	(0.00996)	(0.00635)	(0.00269)	(0.0100)	(0.00629)
Number of riots in the past 5 years	0.0916***	0.0587***	0.0640***	0.0921***	0.0555***	0.0607***
	(0.0150)	(0.0198)	(0.0172)	(0.0151)	(0.0196)	(0.0172)
Coup attempts in the past 5 years	-0.311*	1.226***	0.137	-0.318*	1.223***	0.140
	(0.172)	(0.214)	(0.314)	(0.172)	(0.215)	(0.313)
GDP per capita growth (annual %)	-0.0446***	-0.0627***	-0.0482***	-0.0441***	-0.0625***	-0.0483***
	(0.0112)	(0.0134)	(0.0170)	(0.0112)	(0.0139)	(0.0168)
Lagged rents to GDP	-1.756*	-2.115	5.222**	-1.698+	-2.706	4.733**
	(1.050)	(2.041)	(2.185)	(1.052)	(2.046)	(2.158)
Lagged rents to GDP square	2.193	0.570	-7.726**	2.130	1.197	-7.292*
	(1.965)	(4.081)	(3.933)	(1.965)	(4.058)	(3.878)
Natural log of population	0.427***	0.108	0.240***	0.427***	0.105	0.241***
	(0.0361)	(0.0744)	(0.0714)	(0.0362)	(0.0743)	(0.0704)
Lagged Polity2	0.00666	-0.00567	0.0106	0.00691	-0.00435	0.0143
	(0.00880)	(0.0191)	(0.0206)	(0.00882)	(0.0193)	(0.0202)
Lagged Polity2 square	-0.00693***	-0.0136***	-0.00933**	-0.00701***	-0.0133***	-0.00875**
	(0.00182)	(0.00383)	(0.00374)	(0.00182)	(0.00389)	(0.00373)
Transitional and interregnum regimes	1.123***	0.501	1.311***	1.132***	0.479	1.327***
	(0.270)	(0.448)	(0.414)	(0.270)	(0.455)	(0.411)
Constant	-7.825***	-4.409***	-10.33***	-7.469***	-13.09***	-14.89***
	(0.723)	(1.665)	(1.569)	(0.982)	(4.061)	(2.583)
5-year dummies		Yes			Yes	
Regional dummies		Yes			Yes	
N		5414			5414	

Robust standard errors in parentheses
$^+ p < 0.11$, $^* p < 0.10$, $^{**} p < 0.05$, $^{***} p < 0.01$

Using the coefficients on youth bulge and youth bulge square from table 5, the threshold of youth bulges is calculated from the first order conditions of equation (1) w.r.t. youth bulges. In contrast to Huntington's estimation of a youth bulge threshold of 20% this model estimates the youth bulge threshold to be approximately 36% of the population above 15. The comparison between both measures of youth bulges, from Huntington and Urdal, will be further investigated as robustness checks to the results in section 6. Figure 1 below further demonstrates the significantly non-monotonic relationship between youth bulges and civil wars. The below figure shows the marginal effect of a 1% increase in youth bulges on the probability of civil wars and coups. Expectedly the point at which youth bulges maximize the change in the likelihood of civil wars is higher than that for coup attempts. As civil wars often require much more manpower than coups do.

Figure 1 Non-Monotonic Effect of Youth Bulges
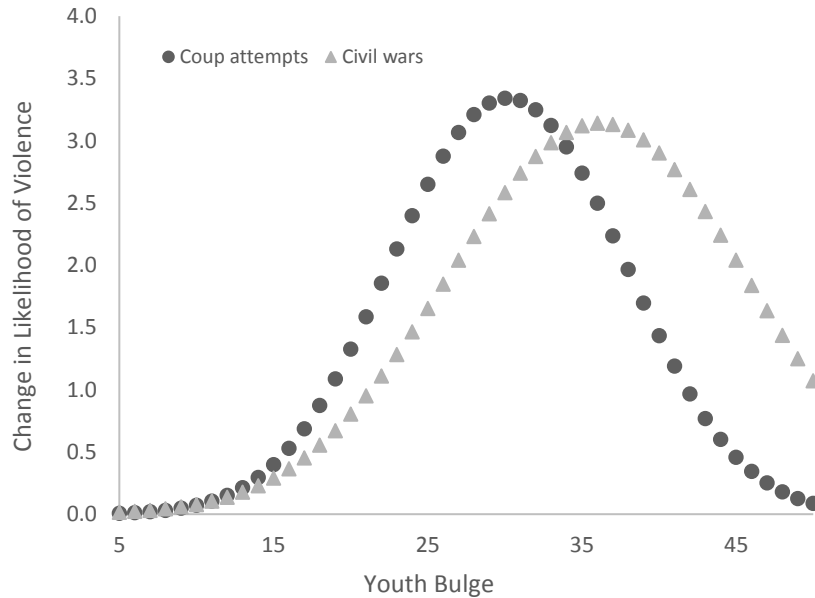
How Youth Bulges Affect Conflict

The full sample panel in table 6 shows that youth bulges significantly increase the likelihood of riots and civil wars by 3.8% and 10.6%, respectively. Although the coefficient on university and secondary school enrollments is significantly positive, the coefficient on the interaction term is significantly negative for both riots and civil wars, but with quite a small magnitude. This means that at a constant level of youth bulges an increase in university and secondary school enrollments significantly reduces the log likelihood ratios of riots and civil wars by a very minor percentage. Meanwhile the combined effect of education is estimated to be increasing the log likelihood ratios of riots and civil wars by 0.005% and 0.01%, respectively. The model estimates in the full sample in table 6, do not predict any significant associate between coup attempts and youth bulges.

In countries characterized with high youth unemployment, youth bulges significantly increase the likelihood of riots, coup attempts and civil wars by 17.7%, 27.9% and 25.2%, respectively. On the contrary, in coutries with high employment rates for young people, youth bulges significantly reduce the probability of all three political violence outcomes: riots by 8.2%, coup attempts by 17.9%, and civil wars by 21.2%. Figure 2 below illustrates the different impacts of a 1% increase in youth bulges on conflict between high and low youth unemployment. Enrollment in countries with low youth unemployment is significantly associated with lower odds for civil wars (p<1%) and coups (p<11%). The positive coefficient on the interaction term for countries with low youth unemployment, howbeit, indicates that at a constant level of youth bulges education significantly increases the likelihood of coups and civil wars by 0.003%. Yet the combined effect of education on violence remains negative, reducing the likelihood of riots by 0.05% and civil wars by 0.09%.

Table 6 Multinomial Logit: Youth Bulge and Youth Unemployment

	Highest 20% Youth Unemployment			Lowest 20% Youth Unemployment			Full sample		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % of pop. above 15	0.163***	0.246**	0.225*	-0.0858*	-0.197**	-0.238***	0.0370***	-0.000794	0.101***
	(0.0583)	(0.125)	(0.128)	(0.0450)	(0.0805)	(0.0905)	(0.0119)	(0.0288)	(0.0263)
University and secondary enrollment	0.000131	-0.00177	0.000377	-0.000428	-0.000532+	-0.000925***	0.0000480*	-0.000233	0.000106*
	(0.000328)	(0.00188)	(0.000626)	(0.000416)	(0.000324)	(0.000269)	(0.0000285)	(0.000334)	(0.0000606)
Youth bulge X University and secondary enrollment	0.000000820	0.0000589	-0.00000602	0.0000189	0.0000273**	0.0000329**	-0.00000240**	0.00000520	-0.00000467*
	(0.0000114)	(0.0000578)	(0.0000194)	(0.0000142)	(0.0000130)	(0.0000151)	(0.00000110)	(0.0000106)	(0.00000251)
Years since the last war	0.00870	0.0149	0.000559	-0.0523***	-0.0168	0.0492*	-0.000939	-0.0515***	0.00927
	(0.0120)	(0.0196)	(0.0233)	(0.0132)	(0.0289)	(0.0270)	(0.00327)	(0.0120)	(0.00711)
Number of riots in the past 5 years	0.156***	-0.134	0.0775*	0.208***	-0.135	-0.00187	0.0867***	0.0482***	0.0622***
	(0.0463)	(0.233)	(0.0457)	(0.0640)	(0.105)	(0.0850)	(0.0140)	(0.0184)	(0.0164)
Coup attempt in the past 5 years	0.673	4.881	1.955*	-0.0526	0.406	0.751	-0.398**	1.195***	0.155
	(0.978)	(3.668)	(1.102)	(0.585)	(0.753)	(0.941)	(0.185)	(0.224)	(0.339)
GDP per capita growth (annual %)	-0.103***	-0.201**	-0.0218	-0.0157	-0.0814***	0.0223	-0.0496***	-0.0623***	-0.0445**
	(0.0346)	(0.0928)	(0.0654)	(0.0232)	(0.0307)	(0.0200)	(0.00891)	(0.0137)	(0.0200)
Lagged rents to GDP	1.544	-1.545	5.793**	0.342	-3.994	4.008	-1.021+	-2.063*	1.300
	(1.916)	(2.438)	(2.496)	(1.288)	(3.489)	(2.953)	(0.632)	(1.119)	(0.921)
Natural log of population	0.208	0.662	-0.191	-0.301	-0.143	0.661	0.483***	0.186*	0.300***
	(0.217)	(0.724)	(0.465)	(0.228)	(0.321)	(0.618)	(0.0494)	(0.0970)	(0.0879)
Lagged polity2	0.0818	0.113	0.157	0.0257	-0.0486	0.0780	-0.00301	-0.00786	0.0139
	(0.0526)	(0.136)	(0.119)	(0.0324)	(0.0433)	(0.0735)	(0.00955)	(0.0180)	(0.0211)
Transitional and interregnum regimes	-0.452	-16.45***	1.890	0.642	0.856	-0.284	1.192***	0.799*	1.351***
	(0.740)	(1.825)	(1.382)	(0.657)	(0.751)	(1.088)	(0.273)	(0.434)	(0.466)
Constant	-12.76***	-23.63+	-10.33	4.717	4.575	-9.762	-10.89***	-6.294***	-12.21***
	(3.731)	(14.70)	(7.687)	(4.088)	(6.056)	(11.13)	(0.978)	(1.972)	(1.857)
5-year dummies		Yes			Yes			Yes	
Regional dummies		Yes			Yes			Yes	
N		488			515			4535	

Robust standard errors in parentheses
+ $p < 0.11$, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 2 Marginal Effects of Youth Bulges

Riots

Coup attempts

Civil Wars
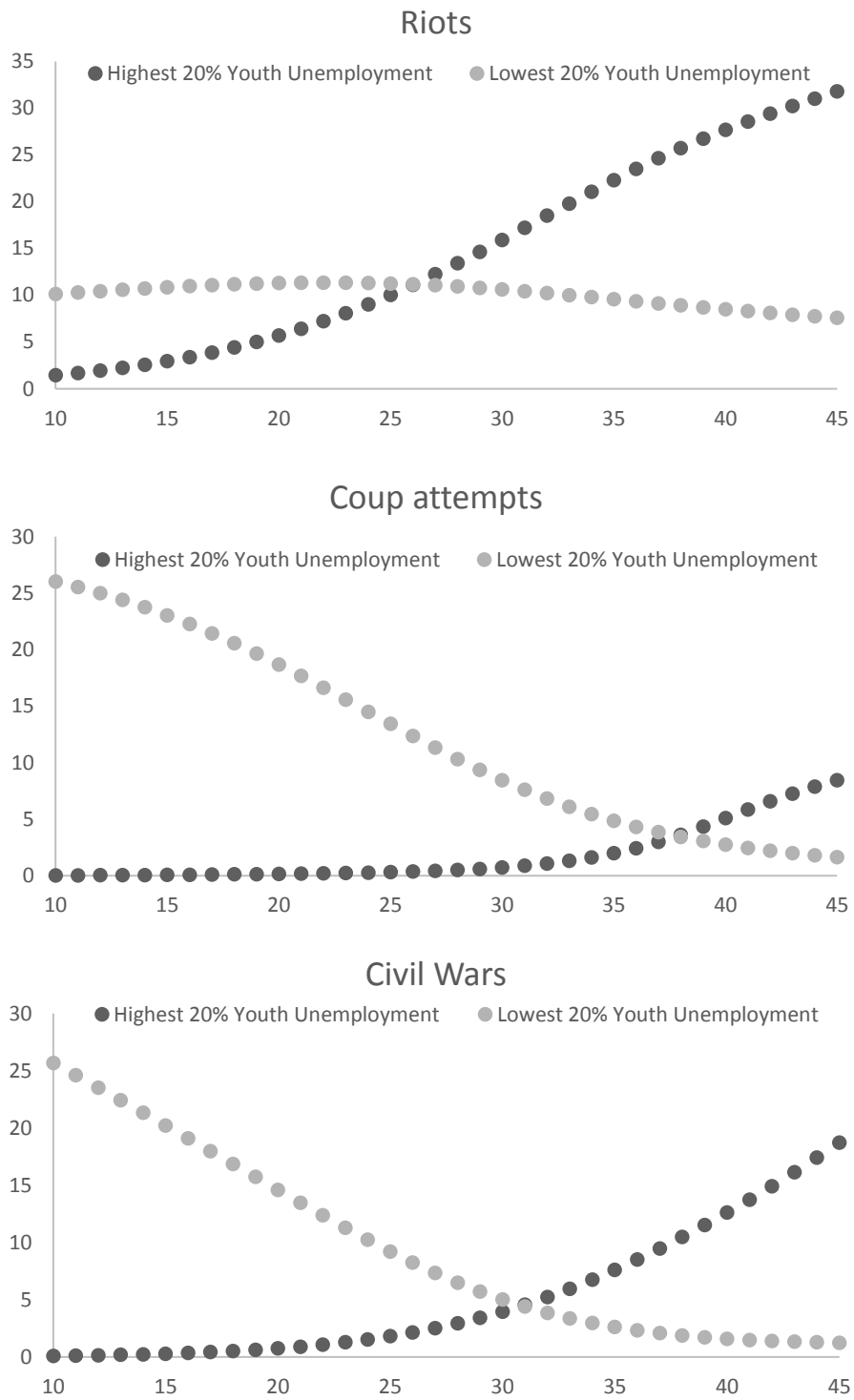
6. Robustness checks

To test for whether the three outcomes of the dependent variable can be combined, I run the Wald test for combined alternatives. Table 7 below shows the Chi-square values of each dependent outcome and its associated p-values. The null hypothesis is that the coefficients of all outcomes are significantly indifferent from zero and thus can be combined. All the p-values on each pair of outcomes suggest that the null can be rejected.

Table 7 Wald Test of Combined Outcomes

	Wald Chi-square	P>chi2
Peace & Riots	610.05	0.000
Peace & Coup attempts	216.406	0.000
Peace & Civil wars	128.735	0.000
Riots & Coup attempts	189.992	0.000
Riots & Civil wars	74.46	0.000
Coup attempts & Civil wars	67.195	0.000

One of the main drawbacks of using a Multinomial Logit specification is that the model does not accommodate estimating random or fixed effects. However, a number of other postestimation tests are available. Table 8 in the appendix summarizes the test for the inependent variables ran using the youth bulge model represented in table 5. As the model used is estimated using robust standard errors the Likelihood Ratio test of independent variables and the Hausman IIA assumption test were inappropriate, therefore the Wald test was used instead. The first column in table 8 represents the Chi-square values for the Wald test for each of the independent values along with the its associate p-values in the second column. The Wald test results show that the hypothesis that all the coefficients of the covariates associated with each political violence outcome are equal to zero can be rejected. Except for the rents level variable and the polity squared variable (which is also reflected in all the above regression tables). More importantly, it shows that the regional and half-decadal dummies are significantly associated with political violence, hence controlling for such covariates was both appropriate and necessary.

The measurement of youth bulges as discussed earlier has been contested in the literature. Collier (2000) and Huntington (1993) suggest using the percentage of young people between the ages of 15 to 24 divided by the total population. While Urdal (2004) suggests using the population above 15 as the reference group, to eliminate potential biases from countries with high fertility rates. The models in table 9 replicate the results from table 5 using the Huntington and Collier measure of youth bulges.

The youth bulge measurement by Huntington (1993) yields smaller ratios, as the denominator is greater when the total population is included instead of counting people above 15. It is therefore expected that the youth bulge threshold, estimated by Huntington, maximizing the likelihood of internal conflict is 20%. This is quite close to the estimated results in the second panel in table 9 where the partial derivative of civil wars w.r.t. youth bulges and youth bulges square yields 20.5%, less than the estimated threshold from model 5. Such underestimation of the youth bulge causes an overestimation in the associated probabilities of civil wars. Comparing the first panel in tables 5 and 9 we see that a 1% increase in Huntington's measure of youth bulges is correlated with a

13.4% increase in the probability of civil war onset, compared to only 8.0% when using the population above 15 as the reference group. Furthermore, replicating the results from model 5 using Huntington's measure of the youth bulge does not estimate a statistically significant non-monotonic relationship with civil wars, that is the square term is insignificant. This is indeed similar to the findings in Collier (2000), where he concludes that youth bulges does not exhibit such a relationship with civil wars. Table 10 in the appendix replaicates the results from table 6 using Huntington's measure, showing almost identical results.

As the impact of polity on violence is statistically significant (as shown in tables 4 and 5), this might affect the effect of youth bulges on violence. In order to test for the robustness of the estimation results discussed above an altrenative measure of polity is introduced. Critiquing the Polity2 index, Cheibub et al. (2010) discuss how the Polity2 index –although based on several polity components– is however arbitrarily weighted. Furthermore, the Polity2 index is prone to measurement errors (Treier & Jackman, 2008). Considering the debate on the conceptualization of the Polity2 measure of democracy, the Varieties of Democracy (V-Dem) data is used as an alternative to the Polity2 data. Table 11 in the appendix shows the models estimated in table 4 with the Liberal Democracy Index from the V-Dem instead of Polity2.

The results in table 11 show that the Liberal Democracy Index is a considerably stronger predictor than the Polity2 index in terms of magnitude. As for youth bulges however, the differences are not as stark. Based on the first panels in tables 5 and 11, a 1% increase in youth bulges increase the likelihood of civil onset by 5.5% when using the V-Dem data compared to 8.0% when using the Polity2 index. In addition, once the V-Dem index is used instead of Polity2 the square term of the youth bulges loses significance. In terms of other covariates both specifications are almost identical. Table 12 replicates the results from table 6 using the V-Dem index instead of Polity2. The results show that youth bulges are significantly associated with reducing the likehood of conflict when highly employed and vice versa.

7. Conclusion and Policy Recommendations

Research by social scientists point to the relationship between large young cohorts and different forms of political violence. All identifying the availability and cost of recruitment as one of the main determinants of conflict onset. The main hypothesis of this paper is that youth availability and the cost of recruiting young people are significantly relevant determinants of political violence. In terms of availability, as the number of young people increase it is easier to recruit rebels (Collier, 2000). From young people's perspective, the opportunity cost of joining a rebellion drastically declines in times of economic hardships.

This paper aims to answer two questions. First: is the availability of large young cohorts associated with different forms of political violence? Second, if such relationship exists, what are the underlying factors which drive such effect? To address these two questions, heterogeneity analysis of youth bulges under different economic circumstances is presented to answer if youth bulges affect conflict, and if yes, how and why? The results presented in this paper show that youth bulges have the highest impact on riots, coups and civil war onset when youth unemployment is high. Addressing such dilemma calls for a number of policies, this section will discuss the economically

relevant ones and call for further research to address potentially political and social policies to mitigate the threat of a growing youth bulge.

The model estimates presented in this paper highlight a significant relationship between large young cohorts and riots, coups and civil wars under different economic conditions and different model specification. Youth bulges robustly affects the likelihood of riots, coup attempts and civil wars in all most all specifications. Indeed, holding everything else equal, during episodes of economic stagnation, young people face a strenuous tradeoff between joining a rebellion or joining the labor market. The presence of a considerable youth bulge further deteriorates the situation, making the competition for scarce opportunities fiercer. An informative example of this tradeoff is mentioned by Collier (2000), where the desertion rates of the Russian civil war between 1919 and 1920 would largely decline during the summer time. Since most of the conflict's participants were peasants, and the summer time was harvest season, this offered a higher income-earning opportunity for the young rebels.

The impact of youth bulges facing fierce competition in the labor market calls for inclusive growth policies. Policies aimed at encouraging entrepreneurship and ease of doing business, not only provide an alternative to traditional job markets, but also ease the pressure on the government to provide public sector jobs for the youth bulge. Additionally, such policies are known to transform informal employment to the formal sector, boosting the productivity of such businesses in the process. Productivity and high returns to non-rebellion activities are key to increasing the opportunity cost of joining a rebellion. Government policies must aim to enshrine two rather essential values in their youth. One is a sense of nationalization and ownership in the state's institutions; and two, is the high returns of non-rebellion labor. Other policies aimed at including young people in the political process can also drastically reduce the likelihood of political violence. However, this would require a political dimension, and possibly an ethnic one too, to the heterogeneity analysis done in this paper to better inform policy makers. Thus, calling for more comprehensive data on youth political inclusion and youth ethnic disparities.

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9. Appendix A

Table 8 Wald Test for Independent Variables

	Wald Chi-square	P>chi2
Youth bulge	14.375	0.002
Youth bulge square	13.296	0.004
Years since the last war	19.482	0.000
Number of riots in the past 5 years	38.445	0.000
Coup attempt in the past 5 years	39.456	0.000
GDP per capita growth (annual %)	30.196	0.000
Lagged rents to GDP	9.852	0.020
Lagged rents to GDP square	5.341	0.148
Natural log of population	143.268	0.000
Lagged Polity2	1.123	0.772
Lagged Polity2 square	28.496	0.000
Transitional and interregnum regimes	23.069	0.000
Half-decadal dummy 1	24.829	0.000
Half-decadal dummy 2	12.902	0.005
Half-decadal dummy 3	20.582	0.000
Half-decadal dummy 4	39.518	0.000
Half-decadal dummy 5	33.296	0.000
Half-decadal dummy 6	54.562	0.000
Half-decadal dummy 7	67.406	0.000
Half-decadal dummy 8	38.152	0.000
Regional dummy 1	8.908	0.031
Regional dummy 2	23.096	0.000
Regional dummy 3	6.337	0.096
Regional dummy 4	487.813	0.000
Regional dummy 5	10.511	0.015
Regional dummy 6	4.429	0.219

Table 9 Youth Bulges as a Percentage of Total Population

	Youth bulge			Youth bulge square		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % of tot. pop.	0.00172	-0.0506	0.126**	-0.144	2.375**	1.129
	(0.0219)	(0.0580)	(0.0548)	(0.161)	(0.931)	(0.780)
Youth bulge square				0.00413	-0.0644***	-0.0268
				(0.00450)	(0.0244)	(0.0211)
Years since the last war	-0.00364	-0.0406***	0.00570	-0.00394	-0.0399***	0.00662
	(0.00264)	(0.00987)	(0.00636)	(0.00267)	(0.00986)	(0.00627)
Number of riots in the past 5 years	0.0916***	0.0595***	0.0607***	0.0918***	0.0594***	0.0599***
	(0.0150)	(0.0194)	(0.0170)	(0.0150)	(0.0193)	(0.0170)
Coup attempt in the past 5 years	-0.311*	1.211***	0.166	-0.311*	1.190***	0.151
	(0.173)	(0.217)	(0.316)	(0.173)	(0.215)	(0.313)
GDP per capita growth (annual %)	-0.0446***	-0.0623***	-0.0486***	-0.0442***	-0.0629***	-0.0486***
	(0.0113)	(0.0134)	(0.0170)	(0.0112)	(0.0137)	(0.0166)
Lagged rents to GDP	-1.755*	-2.142	5.297**	-1.696+	-2.463	5.080**
	(1.052)	(2.051)	(2.193)	(1.053)	(2.089)	(2.207)
Lagged rents to GDP # Lagged rents to GDP	2.186	0.618	-7.999**	2.123	0.936	-7.827**
	(1.968)	(4.102)	(3.968)	(1.967)	(4.163)	(3.971)
Natural log of population	0.427***	0.103	0.244***	0.427***	0.0857	0.238***
	(0.0363)	(0.0748)	(0.0683)	(0.0363)	(0.0762)	(0.0695)
Lagged polity2	0.00663	-0.00570	0.00616	0.00666	-0.00439	0.00837
	(0.00881)	(0.0189)	(0.0202)	(0.00880)	(0.0190)	(0.0202)
Lagged polity2 # Lagged polity2	-0.00697***	-0.0140***	-0.0105***	-0.00704***	-0.0132***	-0.00997***
	(0.00179)	(0.00370)	(0.00374)	(0.00179)	(0.00374)	(0.00371)
Transitional and interregnum regimes	1.125***	0.484	1.306***	1.134***	0.469	1.305***
	(0.270)	(0.449)	(0.415)	(0.270)	(0.451)	(0.414)
Constant	-7.814***	-3.419*	-10.56***	-6.591***	-25.62***	-19.67***
	(0.804)	(1.896)	(1.686)	(1.522)	(9.066)	(6.990)
5-year dummies		Yes			Yes	
Regional dummies		Yes			Yes	
N		5414			5414	

Robust standard errors in parentheses
+ p < 0.11, * p < 0.10, ** p < 0.05, *** p < 0.01

Table 10 Multinomial Logit: Youth Bulge (% of total population) and Youth Unemployment

	Highest 20% Youth Unemployment			Lowest 20% Youth Unemployment			Full sample		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % of tot. pop.	0.269**	1.601***	0.382	-0.198**	-0.285	-0.769**	0.0836***	-0.0332	0.160***
	(0.107)	(0.393)	(0.286)	(0.0955)	(0.203)	(0.301)	(0.0276)	(0.0676)	(0.0600)
University and secondary enrollment	0.0000925	0.00334	0.000833+	-0.000823	-0.000898	-0.00229***	0.0000199	-0.000105	0.000154
	(0.000483)	(0.00313)	(0.000516)	(0.000667)	(0.000562)	(0.000881)	(0.0000492)	(0.000303)	(0.000119)
Youth bulge X University and secondary enrollment	-0.000000660	-0.000169	-0.0000403	0.0000495	0.0000621**	0.000124**	-0.00000190	0.00000176	-0.00000955
	(0.0000255)	(0.000138)	(0.0000257)	(0.0000341)	(0.0000313)	(0.0000483)	(0.00000260)	(0.0000149)	(0.00000668)
Years since the last war	0.00960	0.00408	-0.00480	-0.0515***	-0.00690	0.0631**	-0.000613	-0.0522***	0.00703
	(0.0122)	(0.0302)	(0.0196)	(0.0134)	(0.0273)	(0.0314)	(0.00327)	(0.0120)	(0.00713)
Number of riots in the past 5 years	0.152***	-0.299	0.0727+	0.213***	-0.133	0.00677	0.0838***	0.0486***	0.0572***
	(0.0481)	(0.234)	(0.0449)	(0.0669)	(0.106)	(0.0863)	(0.0141)	(0.0179)	(0.0163)
Coup attempt in the past 5 years	0.721	4.775	1.828+	-0.0841	0.450	0.660	-0.362*	1.192***	0.192
	(0.925)	(3.379)	(1.133)	(0.594)	(0.724)	(0.946)	(0.185)	(0.226)	(0.341)
GDP per capita growth (annual %)	-0.100***	-0.202*	-0.0128	-0.0142	-0.0846***	0.0249	-0.0507***	-0.0626***	-0.0448**
	(0.0335)	(0.116)	(0.0703)	(0.0235)	(0.0312)	(0.0199)	(0.00888)	(0.0138)	(0.0203)
Lagged rents to GDP	1.202	1.516	5.622**	0.412	-3.928	4.915	-1.130*	-2.059*	1.181
	(1.920)	(2.396)	(2.525)	(1.306)	(3.685)	(3.322)	(0.636)	(1.129)	(0.936)
Natural log of population	0.280	1.237*	-0.0747	-0.266	-0.0747	0.705	0.476***	0.183*	0.303***
	(0.237)	(0.670)	(0.501)	(0.228)	(0.339)	(0.652)	(0.0497)	(0.0990)	(0.0850)
Lagged polity2	0.0473	0.0827	0.135	0.0233	-0.0487	0.0839	-0.00539	-0.00910	0.00345
	(0.0527)	(0.115)	(0.126)	(0.0326)	(0.0449)	(0.0773)	(0.00928)	(0.0179)	(0.0204)
Transitional and interregnum regimes	-0.331	-15.19***	2.051	0.704	0.981	0.0192	1.215***	0.791*	1.392***
	(0.717)	(2.123)	(1.375)	(0.644)	(0.721)	(1.125)	(0.271)	(0.435)	(0.462)
Constant	-13.30***	-56.11***	-12.41	5.244	2.714	-3.334	-11.32***	-5.588**	-12.30***
	(4.336)	(17.18)	(10.10)	(4.246)	(7.472)	(9.886)	(1.097)	(2.353)	(2.042)
N		488			515			4535	

Robust standard errors in parentheses

$^+ p < 0.11$, $^* p < 0.10$, $^{**} p < 0.05$, $^{***} p < 0.01$

Table 11 Youth Bulges and Liberal Democracy

	Youth bulge			Youth bulge square		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % of pop. above 15	-0.000405	-0.0110	0.0533**	-0.0760	0.511**	0.270*
	(0.0104)	(0.0253)	(0.0250)	(0.0562)	(0.220)	(0.150)
Youth bulge square				0.00137	-0.00854**	-0.00370
				(0.00100)	(0.00344)	(0.00242)
Years since the last war	-0.00201	-0.0396***	0.00964	-0.00238	-0.0407***	0.00952
	(0.00276)	(0.0103)	(0.00647)	(0.00279)	(0.0102)	(0.00641)
Number of riots in the past 5 years	0.0879***	0.0568***	0.0606***	0.0890***	0.0543***	0.0594***
	(0.0145)	(0.0193)	(0.0167)	(0.0146)	(0.0191)	(0.0167)
Coup attempt in the past 5 years	-0.150	1.303***	0.239	-0.157	1.315***	0.237
	(0.169)	(0.213)	(0.317)	(0.168)	(0.214)	(0.315)
GDP per capita growth (annual %)	-0.0375***	-0.0578***	-0.0448***	-0.0364***	-0.0579***	-0.0448***
	(0.0121)	(0.0126)	(0.0164)	(0.0120)	(0.0131)	(0.0162)
Lagged rents to GDP	-2.020*	-2.366	4.939**	-1.853*	-2.749	4.655**
	(1.038)	(2.072)	(2.230)	(1.041)	(2.086)	(2.220)
Lagged rents to GDP # Lagged rents to GDP	2.944	1.021	-7.434*	2.780	1.331	-7.238*
	(1.882)	(4.058)	(3.956)	(1.880)	(4.097)	(3.945)
Natural log of population	0.444***	0.115	0.269***	0.445***	0.110	0.267***
	(0.0353)	(0.0754)	(0.0700)	(0.0354)	(0.0749)	(0.0698)
Lagged Liberal Democracy Index	2.326***	4.969*	4.559**	2.508***	5.171*	4.281**
	(0.761)	(2.537)	(1.987)	(0.768)	(2.742)	(2.024)
Lagged Liberal Democracy square	-3.337***	-10.39**	-7.503***	-3.583***	-10.58**	-6.905***
	(0.896)	(4.647)	(2.512)	(0.908)	(5.156)	(2.615)
Transitional and interregnum regimes	1.312***	0.774*	1.505***	1.325***	0.745*	1.507***
	(0.256)	(0.405)	(0.388)	(0.256)	(0.413)	(0.388)
Constant	-8.625***	-4.981***	-10.87***	-7.715***	-12.63***	-13.87***
	(0.721)	(1.699)	(1.528)	(0.981)	(3.918)	(2.533)
N		5446			5446	

Robust standard errors in parentheses
+ p < 0.11, * p < 0.10, ** p < 0.05, *** p < 0.01

Table 12 Multinomial Logit: Youth Bulge and Youth Unemployment (Using V-Dem)

	Highest 20% Youth Unemployment			Lowest 20% Youth Unemployment			Full sample		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % of pop. above 15	0.0943[+]	0.0453	0.155	-0.0873[**]	-0.198[**]	-0.196[**]	0.0374[***]	-0.00656	0.0802[***]
	(0.0586)	(0.167)	(0.131)	(0.0439)	(0.0813)	(0.1000)	(0.0126)	(0.0286)	(0.0263)
University and secondary enrollment	0.000101	-0.00258[**]	0.000329	-0.000419	-0.000211	-0.000718[**]	0.0000456	-0.000171	0.0000820
	(0.000338)	(0.00126)	(0.000547)	(0.000418)	(0.000383)	(0.000316)	(0.0000288)	(0.000311)	(0.0000581)
Youth bulge X University and secondary enrollment	0.000000779	0.0000849[**]	-0.00000180	0.0000188	0.0000173	0.0000282[*]	-0.00000237[**]	0.00000347	-0.00000382
	(0.000000120)	(0.0000410)	(0.0000158)	(0.0000143)	(0.0000145)	(0.0000144)	(0.00000111)	(0.00000991)	(0.00000243)
Years since the last war	0.00806	0.0297	0.00235	-0.0517[***]	-0.0117	0.0547[**]	-0.000505	-0.0486[***]	0.0111
	(0.0112)	(0.0275)	(0.0275)	(0.0131)	(0.0285)	(0.0278)	(0.00337)	(0.0122)	(0.00720)
Number of riots in the past 5 years	0.145[***]	-0.110	0.0619	0.210[***]	-0.128	0.0176	0.0834[***]	0.0453[**]	0.0617[***]
	(0.0449)	(0.176)	(0.0529)	(0.0646)	(0.110)	(0.0824)	(0.0135)	(0.0180)	(0.0160)
Coup attempt in the past 5 years	0.141	3.674	1.406	-0.0453	0.264	0.864	-0.351[*]	1.122[***]	0.0572
	(0.875)	(2.774)	(0.966)	(0.590)	(0.757)	(0.918)	(0.180)	(0.223)	(0.334)
GDP per capita growth (annual %)	-0.0164	-0.156[*]	-0.00867	-0.0188	-0.0792[***]	0.0237	-0.0412[***]	-0.0581[***]	-0.0414[**]
	(0.0666)	(0.0855)	(0.0494)	(0.0228)	(0.0304)	(0.0198)	(0.0112)	(0.0133)	(0.0190)
Lagged rents to GDP	1.481	-3.927[*]	3.343	0.263	-4.882	3.781	-0.786	-2.218[*]	0.973
	(1.586)	(2.191)	(2.128)	(1.318)	(4.558)	(2.663)	(0.613)	(1.138)	(0.902)
Natural log of population	0.350[**]	0.758	-0.109	-0.296	-0.214	0.642	0.494[***]	0.175[*]	0.298[***]
	(0.176)	(0.520)	(0.469)	(0.244)	(0.315)	(0.562)	(0.0487)	(0.0974)	(0.0897)
Lagged Liberal Democracy Index	-1.480	-3.269	-0.930	0.128	-4.742[**]	-0.699	-0.226	-1.219[*]	-0.810
	(1.436)	(4.610)	(2.302)	(1.152)	(2.314)	(2.787)	(0.274)	(0.656)	(0.678)
Transitional and interregnum regimes	-0.508	-16.26[***]	1.534	0.618	0.625	-0.313	1.217[***]	0.765[*]	1.333[***]
	(0.656)	(1.700)	(1.402)	(0.666)	(0.774)	(0.974)	(0.270)	(0.424)	(0.446)
Constant	-11.76[***]	-16.46	-8.048	4.673	6.612	-10.74	-11.01[***]	-5.642[***]	-11.25[***]
	(3.423)	(10.88)	(7.425)	(4.441)	(6.018)	(10.89)	(0.995)	(2.020)	(1.945)
N		500			516			4551	

Robust standard errors in parentheses

[+] $p < 0.11$, [*] $p < 0.10$, [**] $p < 0.05$, [***] $p < 0.01$