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ON THE DETERMINANTS OF RIOTS,
COUPS AND CIVIL WARS
THE EFFECT OF YOUTH BULGES

HOSAM IBRAHIM
2019

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

A Thesis Submitted to
The Department of Economics

In partial fulfillment of the requirements for
the degree of Master of Arts in Economics

by Hosam Ibrahim

Under the supervision of Dr. Samer Atallah

January 2019

The American University in Cairo

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

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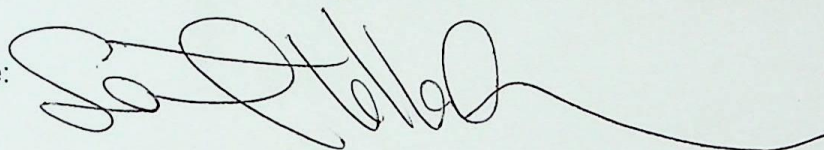
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On the Determinants of Riots, Coups and Civil Wars: The Effect of Youth Bulges

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American University in Cairo

December 2018

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 heterogeneous 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 per capita GDP growth. 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 economic stagnation.

Key words: Civil war, Coup d'état, Riots, Youth Bulge, Political Institutions, Natural Resources, Conflict Resolution

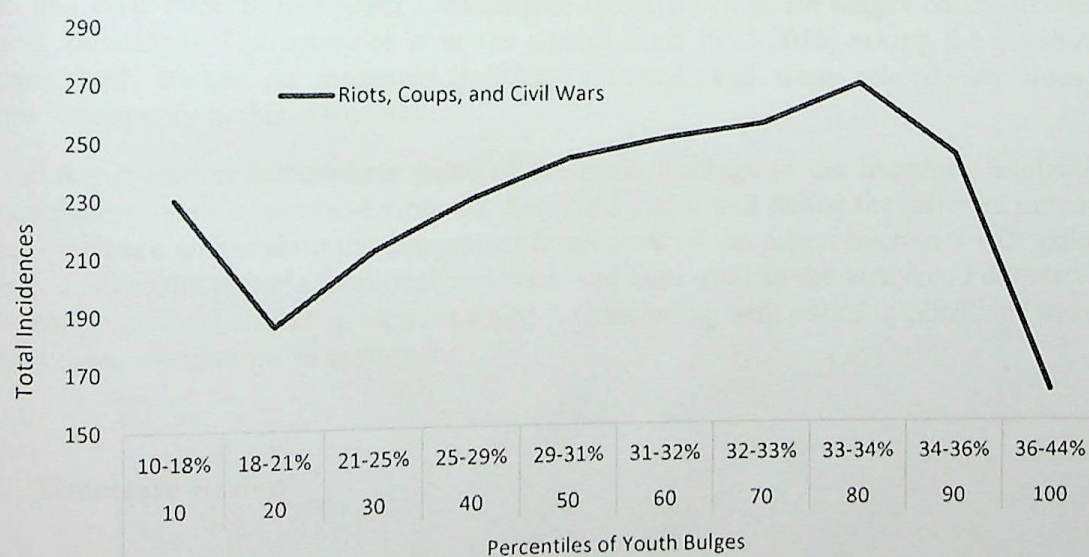
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1. Introduction

The youth bulge phenomenon under certain circumstances is statistically associated with political unrest (Goldstone, 2002). As the percentage of a young population (relative to adults) rises the probability of intra-state conflict increases. 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 scarcity¹. During the period between 1946 to 2016 the world has witnessed a total of 2,452 political violence events: precisely 1,897 riots, 329 coup attempts and 226 civil wars². 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 figure 1). Conflict theorists have linked persistent economic hardships and youth bulges with political violence³. 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 (Goldstone, 2002). The purpose of this paper is to help explain the influence of youth bulges on political violence and whether large young cohorts is a common determinant of different types of internal conflict. The novelty of this paper is to probe deeper to examine the role of youth unemployment as a channel for explaining the effect of youth bulges.

Figure 1 Youth Bulges and Political Violence



Source: U.S. Census Bureau, Banks (2016), Powell & Thyne (2011) and Armed Conflict (PRIO).

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).

Being the most destructive form of internal conflict, most of the literature on political violence focuses on understanding the causes of civil wars exclusively. Bodea, Elbadawi, & Houle (2017), however, suggest that such approach overlooks the integrative impact of lower levels of political violence on civil wars. Other conflict studies solely measure coups, riots or assassinations as independent events⁴. Independently studying different forms of political violence understates the likelihood that they might share similar structural determinants. 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 strategies employed in regime change schemes. Concurrently, in this paper I argue that popular discontent (such as riots) and leadership survival dynamics (such as coup d'État) are overlappingly interrelated with civil wars in countries with large young cohorts.

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, as will be discussed in later sections in this paper. 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 political violence.

This paper contributes to the literature by questioning whether youth bulges in countries with considerable youth unemployment and economic stagnation is a common determinant of riots, coups, and civil wars. In this paper I investigate the effect of youth bulges on the likelihood of political violence in 159 countries over the period from 1992-2016, asking the question as to whether youth bulges do influence political violence, and what role if any does youth unemployment play in this association.

The following section summarizes some of the main findings in the literature, explaining the relevant determinants of political violence. Section 3 and 4 will define the different outcomes of political violence and explain the conceptual framework of the paper. Section 5 will explain the research design, the paper's empirical approach and data used in the analysis. Followed by the results and robustness checks in sections 6 and 7. Concluding with policy implications and further research recommendations in section 8.

2. Literature Review

Investigating whether civil wars and other political violence events share common determinants has theoretical implications on studying civil wars. Cunningham & Lemke (2014) find that ethnic fractionalization, population, and regime type have a commonly positive effect on the incidences of different types of conflict. Cunningham and Lemke state that theories explaining the relationship between civil wars and such common determinants (or other forms of conflict) can be

⁴ See Luttwak (1968), Jackman (1978), Belkin & Schofer (2003), Powell (2014), and Houle (2016).

used to explain civil wars more broadly and apply to other 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 intertwine under certain circumstances. They find that factional partial democracies and ethnic exclusion from power are common determinants of riots, coups and civil wars. Bodea et al. (2017) 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/decreasing the chances of coup d'état and civil wars. This literature does not, however, address youth bulges as a common determinant of different political violence events. Contributing to the recent research of common conflict determinants, this paper introduces population characteristics as a common determinant of such political violence.

Youth bulges are argued to have an effect on both the opportunity cost and motive of political violence. During episodes of economic stagnation and youth unemployment, countries with considerable youth bulges, are more susceptible to internal conflict as the opportunity cost of 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 the the opportunity cost of recruiting young men to join armed conflicts are quite low, especially during economic hardships, 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.

Investigating whether youth bulges are common determinants of different forms of political conflict remains a lacuna in the conflict literature. Huntington (1993) finds that youth bulges have a non-monotonic effect on the likelihood of armed civil conflict. Huntington further estimates the threshold at which youth bulges maximize the probability of conflict at 20% of total population. Empirical evidence from Urdal (2004) and (2006) suggest strong evidence of a non-linear relationship between large young cohorts 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. Furthermore, he adds 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.

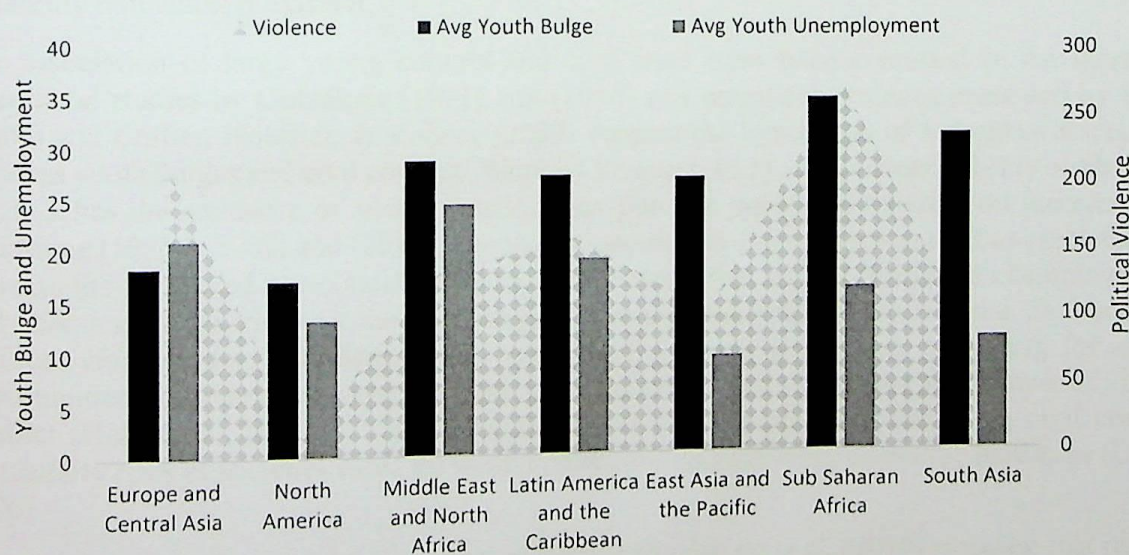
In terms of political institutions, mainstream literature suggests that the relationship between conflict and political institutions is a non-linear one. The inverted U-shape relationship was earlier suggested by Luttwak (1968), Gurr (1974), and Jackman (1978) stating that the most autocratic and democratic regimes are known to be the least likely to experience internal conflict. A highly effective democracy and a well-established autocracy are statistically correlated with less conflict (Fearon & Laitin, 2003; Gates, Hegre, Jones, & Strand, 2006; Hegre, Ellingsen, Gates, & Gleditsch, 2001). The hypothesis of an inverted U-shaped relationship is based on the following: effective political participation and a politically competitive system, as well as total authoritarianism, reduce the chances of insurgencies. While on the other hand states ruled by anocratic regimes are more prone to social grievances that may lead to violence. The rationale is that in autocratic states, despite the high grievances, political repression increases the opportunity cost to join a rebel and therefore reduces the probability of violence. For the case of full democracies on the other hand, high income and low grievances will likely reduce the likelihood and hazard of violence.

3. Conceptual Framework

The political conflict literature indicates that different political violence outcomes may share similar contributing factors. Investigating whether different forms of political violence are induced by common determinants started in the late 1960s. 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's 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 conferred as common causes of different political violence outcomes.

Political unrest in several Arab countries in 2011 started as a result of one or more similar causes: anocratic rule, political repression, ethnic dissention and economic stagnation; it however resulted in vastly different forms of internal violence. The same also applies to unstable partial democracies in Latin America and Sub Saharan Africa, where corruption, inequality and economic hardships led to disparate political violence outcomes. Figure 2 shows levels of youth bulges, youth unemployment and political violence (aggregating riots, coups and civil wars) by region in the period between 1992-2016. Where the 3 regions with the high youth bulges have experienced the most of political violence, namely: MENA, Latin America and Sub Saharan Africa.

Figure 2 Political Violence and Youth by Region (1992-2016)



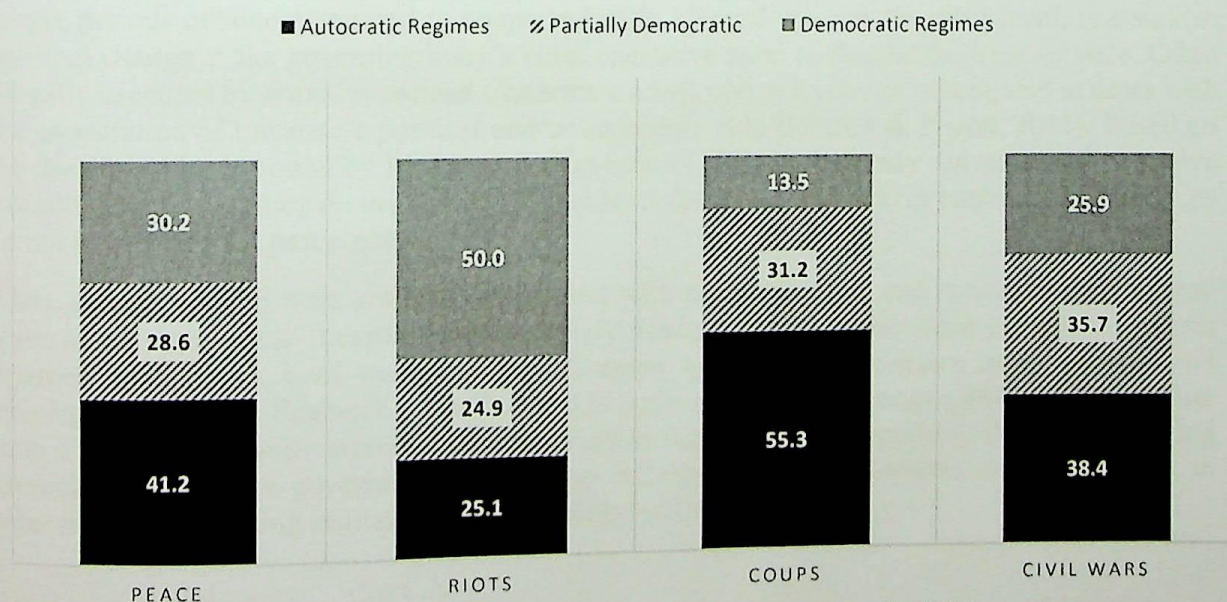
Source: U.S. Census Bureau, Banks (2016), Powell & Thyne (2011) and Armed Conflict (PRIO).

Although Europe has relatively high youth unemployment, it is also characterized by low youth bulges and effective politics to channel ethnic or political discontent. Moreover, political violence in Europe during this period, is mainly due to riots and the post-Soviet Union episodes of conflict. Young people in MENA on the other hand, constitute a considerable percentage of the population (30%) and nearly a quarter of those young people are unemployed. However, since the 1990s MENA was mostly ruled by authoritarian republics and monarchs. These countries suffered from

that potent political repression in authoritarian regimes induces displacement and effectively abates insurgencies, although might eventually lead to leadership failure. Effectively democratic regimes on the other hand, are able to peacefully channel political dissention by providing a peaceful and adequate political arena and hence drastically reduce the likelihood of civil wars. While partial (weak) democracies seem to varyingly lack the appropriate peaceful avenues to resolve political or ethnic discontent and therefore experience more conflict. This relationship is referred to as the “inverted u-shape”, where countries on the extremes of a polity measure are less prone to domestic armed conflicts than partial democracies (Goldstone et al., 2010).

The inverted U-shape association was proposed in the literature as early as the late 1960s (Gurr, 1974; Jackman, 1978; Luttwak, 1968) stating that the most autocratic and democratic regimes are known to be the least likely to experience internal conflict. Concurrently, Fearon & Laitin (2003) and Gates et al. (2006), find that a highly stable democracy and a well-established autocracy are statistically correlated with less conflict. The hypothesis of an inverted-U relationship is based on the following: effective political participation in a competitive system, as well as total authoritarianism, reduce the chances of insurgencies. While on the other hand states ruled by weak political institutions and anocratic regimes are more prone to social grievances that may lead to political violence, particularly during periods of economic stagnation. Figure 3 below shows different political conflict outcomes in different regime types. Remarkably almost 55% of coup attempts took place in dictatorships. Likewise, autocratic and anocratic regimes are more likely to experience civil wars (38 and 36% of civil wars took place in such regimes, respectively). Meanwhile, riots are equally distributed between fully democratic regimes and other regimes (Banks & Wilson, 2018; Powell & Thyne, 2011).

Figure 3 Regime Type and Conflict Type (%)



Source: Polity 2, Banks (2016), Powell & Thyne (2011) and Armed Conflict (PRIO).

This paper's model extends Urdal (2006) and adds to the literature by investigating the conjoint effect of youth bulges with regime types and economic factors on riots, coups and civil war onset.

4. Defining Riots, Coups, and Civil Wars

The definition of riots, coups and civil wars could not be more contended in the literature-generating both theoretical and empirical 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).

According to Bodea et al. (2017) riots are defined as potent demonstrations caused by political or social grievances, riots may be catalogued 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'état, 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 instability⁵. Table 1 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'état attempts with onset of civil wars. Further supporting the hypothesis that coup-proofing strategies where weak governments attempt to influence perennial domestic armed conflicts, in order to prevent a strong military institution from seizing power.

⁵ See Goemans (2008), Goldstone et al. (2010) and Smith (2004).

Table 1 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

5. Empirical Framework for Youth Bulges and Conflict

The sample used contains 5,922 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.

Table 2 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
	Number of previous wars	Armed Conflict (PRIO)	1.469	2.442	0	23
Opportunity cost of conflict	Youth bulge	U.S. Census Bureau	27.101	8.174	10.777	41.597
	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 in this paper 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, the history of riots (the past 5 years) and the number of wars the country has experienced is quite practical in order to eliminate potential endogeneity problems with the model specification (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 decadal dummies to control for various regional externalities as well as potential time-varying biases.

Measuring the Dependent Variables

In terms of civil wars, the Prio/Uppsala dataset is used, which identify 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 reference group). In this model civil wars are considered the most critical form of political violence, followed by coups then riots. The implications if this assumption are important for the operationalization of the data. The reasoning for such operationalization is as follows: first, because civil wars involve the most casualties amongst all three possible outcomes, and generally occur over longer periods of time. Second, coups 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 dataset⁶.

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). Where Collier's computation of youth bulges is based on Huntington (1993). The rationale behind such operationalization is to limit the effect of countries with high fertility rates. Particularly 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. In addition, three measures of political regimes are constructed using the Polity2 index: autocracy (polity score -10 to -5), partial democracy (-4 to 4), and full democracy (5 to 10). 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 &

⁶ 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

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 an alternative measurement of democracy 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 categorically defined dependent variable compared to a reference group. In this case intra-state political violence is coded as one variable using the previously mentioned operationalization with 3 possible outcomes, and countries at peace as the reference group.

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

Where $\beta_{M,k}$ is the regression coefficient corresponding to the M^{th} independent variable and the k^{th} 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 conflict⁷. X_{it} is the set of covariates measuring the endogeneity controls, opportunity cost of conflict, and political institutions. While η_i and v_t represent regional and decadal dummies, respectively.

The raw coefficients of the multinomial logit represent the relative log odds of each conflict outcome (i.e. riots, coups or civil wars). Equation (2) below illustrates how the log odds 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 k^{th} conflict outcome (Greene, 2002):

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

⁷ 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 exists.

6. Results

Table 3 below shows the results of the baseline model for riots, coups and civil wars. In congruity with Horowitz (2001), the model in table 3 resolves 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, reduce the chance of all the forms of political violence in the model. In light of the coup-proofing strategies discussed earlier, the number of peace years and the state's military experience behave as expected, reducing the log likelihood of experiencing coup attempts. However, only years of peace is statistically significant at the 1% level. The baseline model results in table 3 also estimate a positive linear associate with natural resource rents and negative square term. However, the model seems to predict no significant relationship between rents and coups or riots. This is expectedly concurrent with the literature on natural resources and civil conflict.

Table 3 Multinomial Logit: Baseline Model

	Baseline model		
	Riots	Coup attempts	Civil wars
Years since the last war	0.000723 (0.00252)	-0.0505*** (0.0101)	0.00133 (0.00621)
Number of riots in the past 5 years	0.0963*** (0.0134)	0.0738*** (0.0195)	0.0818*** (0.0168)
Number of previous wars	0.0217 (0.0217)	-0.00821 (0.0497)	-0.00390 (0.0496)
GDP per capita growth (annual %)	-0.0479*** (0.0107)	-0.0644*** (0.0122)	-0.0511*** (0.0172)
L. Rent to GDP	-1.463 (0.938)	-2.427 (2.019)	4.608** (2.265)
L. Rent to GDP square	2.255 (1.779)	1.554 (4.183)	-7.664* (4.330)
Natural log of population	0.416*** (0.0338)	0.0732 (0.0808)	0.250*** (0.0718)
L. Polity	0.0178** (0.00823)	-0.0199 (0.0181)	-0.00101 (0.0203)
L. Polity square	-0.00713*** (0.00157)	-0.0151*** (0.00351)	-0.0137*** (0.00356)
Transitional and interregnum regimes	1.028*** (0.256)	0.799** (0.402)	1.123*** (0.382)
Constant	-8.505*** (0.576)	-2.892** (1.283)	-7.414*** (1.238)
Decadal dummies		Yes	
Regional dummies		Yes	
N		5922	

Robust standard errors in parentheses

* $p < 0.11$, ** $p < 0.10$, *** $p < 0.05$, **** $p < 0.01$

The results of regime types, measured using the Polity2 index as well as a binary variable for transitional and interregnum regimes, are typical of the literature. The model estimates a non-linear relationship between regime type and all three types of internal conflict. Suggesting that the inverted U-shape relationship holds for association between polity and riots, coups, and civil wars. Similar to the results found by Gates et al. (2006) perpetual regime change and transitional regimes are also strong predictors of all 3 forms of political violence.

Using the estimated coefficients of Polity2 and Polity2 squared from the baseline model, the different threshold Polity scores can be calculated for the 3 forms of political violence, at which the model estimates the maximum log likelihood of riot incidences, coup attempts and civil war onset. From the first order conditions and partial derivatives of equation (1) w.r.t. Polity2 we get that the threshold score maximizing the likelihood of riots, coups and civil wars are 1.25, 0.66 and 0.04, respectively. Expectedly the highest threshold Polity2 score is for riots followed by coups and civil wars. Such results are again consistent with the literature. In fact, countries with Polity2 scores between 0 and 2 did experience the most of the political violence events (precisely 130 riots, 26 coup attempts and 29 civil wars).

Youth Bulges

Table 4 below shows the 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 (2004) hypothesis of a strictly linear association.

The model results show that youth bulges have both a significantly linear and non-linear relationship with civil wars and a strictly non-linear association with coups. Yet the model estimates do not show a significant relationship between youth bulges and riots. The coefficients of a multinomial logit are estimated log likelihoods of the outcomes, exponentiating the coefficient 0.0647 (significant at the 1% level) in the *Youth Bulge* panel for civil wars, that is 1.067. Thus, a 1 percent increase in the youth bulge is associated with increasing the probability of civil war onset by 6.7% relative to countries in peace.

Using the coefficients of youth bulge and youth bulge square from table 4, the threshold of youth bulges can be calculated using the first order conditions of equation (1) w.r.t. youth bulges. In contrast to Huntington's estimation of youth bulge threshold of 20% the below model estimates the youth bulge threshold to be approximately 35% of the total population above 15, in line with the stylized facts presented in figure 1 in the introduction section. The comparison between both measures of youth bulges will be further investigated as robustness checks to the results.

Table 4 Multinomial Logit: Introducing Youth Bulges

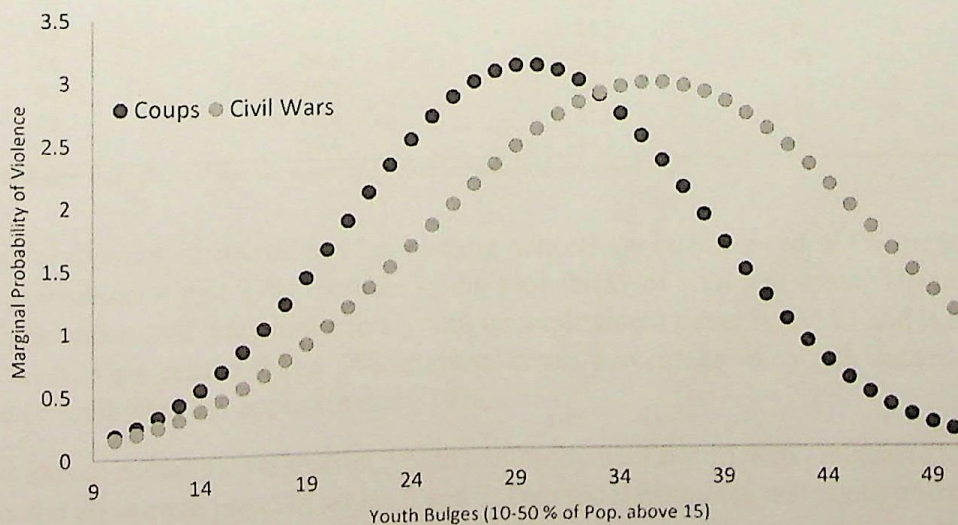
	Youth bulge			Youth bulge square		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % above 15	0.00469 (0.00933)	-0.00884 (0.0249)	0.0647*** (0.0235)	-0.0147 (0.0468)	0.455*** (0.212)	0.336*** (0.142)
Youth bulge square				0.000369 (0.000858)	-0.00765*** (0.00327)	-0.00472*** (0.00233)
Years since the last war	0.00102 (0.00260)	-0.0511*** (0.0106)	0.00485 (0.00613)	0.000959 (0.00262)	-0.0512*** (0.0108)	0.00533 (0.00608)
Number of riots in the past 5 years	0.0965*** (0.0134)	0.0726*** (0.0197)	0.0850*** (0.0170)	0.0967*** (0.0135)	0.0708*** (0.0198)	0.0829*** (0.0171)
Number of previous wars	0.0220 (0.0217)	-0.0103 (0.0505)	0.00397 (0.0502)	0.0227 (0.0218)	-0.0141 (0.0513)	0.00151 (0.0490)
GDP per capita growth (annual %)	-0.0482*** (0.0107)	-0.0645*** (0.0124)	-0.0520*** (0.0167)	-0.0477*** (0.0107)	-0.0636*** (0.0129)	-0.0522*** (0.0164)
L. Rent to GDP	-1.514* (0.937)	-2.440 (2.022)	4.279** (2.175)	-1.487 (0.939)	-2.910 (2.009)	3.866* (2.167)
L. Rent to GDP square	2.359 (1.769)	1.577 (4.194)	-6.892* (4.134)	2.332 (1.768)	2.096 (4.136)	-6.519 (4.108)
Natural log of population	0.416*** (0.0338)	0.0749 (0.0811)	0.243*** (0.0743)	0.416*** (0.0338)	0.0712 (0.0819)	0.248*** (0.0735)
L. Polity	0.0181** (0.00820)	-0.0207 (0.0184)	0.00458 (0.0197)	0.0185** (0.00823)	-0.0203 (0.0186)	0.00647 (0.0194)
L. Polity square	-0.00688*** (0.00168)	-0.0153*** (0.00364)	-0.0110*** (0.00370)	-0.00693*** (0.00168)	-0.0153*** (0.00368)	-0.0104*** (0.00369)
Transitional and interregnum regimes	1.031*** (0.256)	0.789* (0.405)	1.181*** (0.381)	1.036*** (0.255)	0.768* (0.410)	1.193*** (0.380)
Constant	-8.667*** (0.659)	-2.618* (1.467)	-9.485*** (1.531)	-8.424*** (0.872)	-9.410*** (3.730)	-13.31*** (2.495)
Decadal dummies	Yes					
Regional dummies	Yes					
N	5922					

Robust standard errors in parentheses

* $p < 0.11$, ** $p < 0.10$, *** $p < 0.05$, **** $p < 0.01$

Figure 4 below further demonstrates the significantly non-monotonic relationship between youth bulges, coups and civil wars. The below figure shows the marginal effect of a 1% increase in youth bulges (as a percentage of population above 15) on the probability of both outcomes.

Figure 4 Marginal Effect of Youth Bulges on Coups and Civil Wars



Notably, when youth bulges are introduced in table 4, natural resource rents become marginally significant at the 11% level compared to the baseline model in table 3. This is in line with Gurr's (1970) hypothesis, where natural resource rents can be used in wealth redistribution mitigating popular political discontent and ultimately reducing riots. Consistently a history of riots as well as incessant regime change are estimated as common determinants of riots, coups and civil wars.

How Youth Bulges Affect Conflict

Using the same multinomial logit specification, the next two models help explain how and why are youth bulges associated with political violence. The two model in tables 6 and 7 introduce an important incentive for young people to join a rebellion, youth unemployment. Table 5 shows heterogeneity analysis for youth bulges in countries characterized with high and low youth unemployment, while table 7 shows countries per capita GDP growth below and above 1%. Per capita GDP growth is utilized in this model as a proxy for economic progress/stagnation.

The results in table 6 are noteworthy. In countries with high youth unemployment, a 1% increase in youth bulges are associated with an incredible 283% increase in the probability of a coup attempt, relative to countries in peace. Countries with youth unemployment rates at the top 20th percentile have more than 37% of their youth being unemployed on average and experienced 11 coup attempts (see table 5 below). On the contrary, in countries with high youth employment, youth bulges considerably reduce the chances of coup attempts, precisely by more than 13%.

Table 5 Political Violence: Youth Bulges and Youth Unemployment

Youth unemployment (percentile)	Median youth bulge (%)	Median youth unemployment (%)	Riots	Coups	Civil wars
10	34.0	2.9	73	10	7
20	33.0	5.8	91	21	11
30	29.4	8.7	110	3	6
40	31.1	10.7	81	16	17
50	27.7	12.9	65	5	9
60	26.1	16.3	95	6	8
70	24.5	19.6	75	4	4
80	24.2	24.4	79	3	7
90	26.5	31.6	87	6	9
100	29.4	43.3	84	5	15

Source: World Bank WDI, Banks (2016), Powell and Thyne (2011), PRIO and author own calculation.

In terms of civil wars, in countries where young cohorts are unemployed, a 1% increase in youth bulges is associated with a 27% increase in the probability of civil war onset. The coefficient on youth bulges under civil wars in the low youth unemployment panel is -0.153 and is significant at the 11% level. This means that a 1% increase in the percentage of youth bulges reduces the likelihood of civil wars by approximately 14%.

During periods of economic stagnation, youth unemployment significantly increases the likelihood of riots. In the all sample panel in tables 6 and 7, the model estimates that youth unemployment is significantly associated with decreasing the probability of coups. While the first result is intuitive,

the latter is hard to interpret. The negative relationship between youth unemployment and coup detat can be attributed to possibly low youth empoerment. As youth unemployment increases, young people are less involved in the political process, increasing the chances for military regimes to seize power.

In table 7 the estimation results show that youth bulges in periods of economic progress (per capita GDP growth above 1%) is significantly reduces the odds of violent clashes and riots by 4%. However, during economic stagnation (growth below 1%) the probability of coups and civil wars by significantly increases by 15% and 23%, respectively. The panels in figure 5 below show the significant marginal effects of a 1% increase in youth bulges on coups and civil wars.

Figure 5 Marginal Effects of Youth Bulges on Political Violence

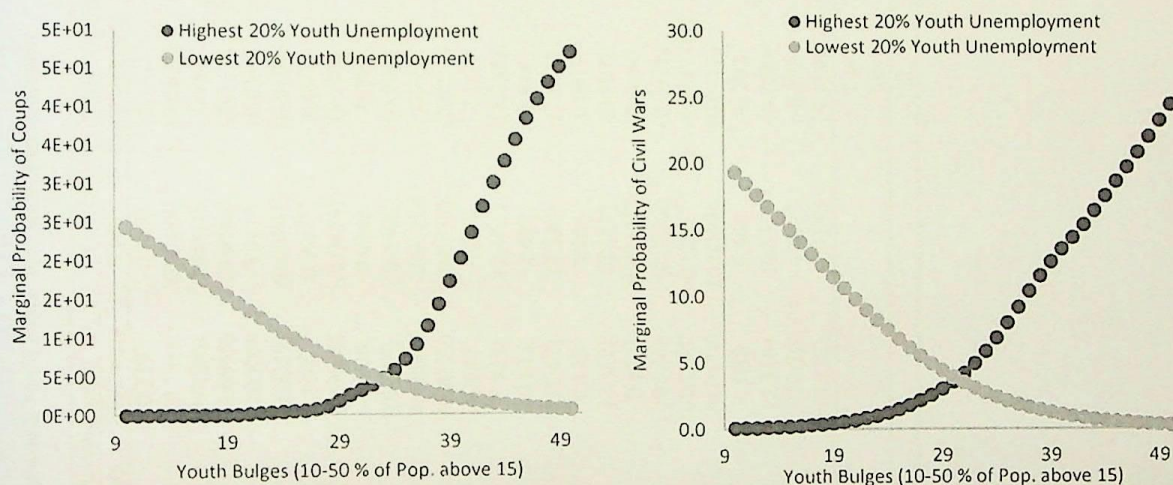


Table 6 Multinomial Logit: Youth Bulge and Youth Unemployment

	Highest 20% Youth Unemployment			Lowest 20% Youth Unemployment			All		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % of pop. above 15	0.0353 (0.0390)	1.343* (0.713)	0.239* (0.131)	-0.0273 (0.0334)	-0.142** (0.0675)	-0.153* (0.0960)	0.00177 (0.0117)	-0.0357 (0.0399)	0.0562* (0.0337)
L. Youth unemployment	0.00978 (0.0201)	-0.0920 (0.130)	0.00280 (0.0595)	0.00315 (0.0710)	0.167 (0.135)	0.000953 (0.171)	0.00503 (0.00454)	-0.0324** (0.0130)	0.0114 (0.00960)
Years since the last war	0.0140* (0.00865)	-0.208* (0.109)	-0.00709 (0.0239)	-0.0113 (0.00941)	-0.0334* (0.0199)	-0.00633 (0.0221)	0.00235 (0.00289)	-0.0410*** (0.0134)	-0.000836 (0.00861)
Number of riots in the past 5 years	0.120*** (0.0369)	0.173*** (0.0558)	0.164*** (0.0438)	0.205*** (0.0474)	0.0699 (0.109)	0.0511 (0.124)	0.136*** (0.0209)	0.167*** (0.0306)	0.140*** (0.0271)
Number of previous wars	0.326** (0.145)	-8.947 (7.325)	-0.376 (0.553)	0.0246 (0.0406)	-0.200 (0.204)	0.0162 (0.0911)	0.0489** (0.0241)	-0.151 (0.107)	0.0170 (0.0526)
GDP per capita growth (annual %)	-0.0202 (0.0281)	0.0965 (0.261)	-0.0804** (0.0399)	-0.00714 (0.0239)	-0.0893*** (0.0252)	0.0192 (0.0482)	-0.0440*** (0.0163)	-0.0780*** (0.0162)	-0.0308 (0.0340)
L. Rent to GDP	3.046 (3.852)	35.34 (53.73)	6.687 (7.723)	-1.150 (2.401)	-3.062 (5.058)	-1.640 (9.237)	-1.166 (1.131)	2.668 (3.418)	4.520* (2.797)
L. Rent to GDP square	-3.462 (7.608)	-349.6 (295.8)	-0.817 (10.47)	2.407 (3.538)	2.644 (7.363)	-0.0897 (16.57)	2.362 (2.074)	-4.916 (7.097)	-6.732 (5.050)
Natural log of population	0.233* (0.131)	3.985 (3.907)	0.135 (0.382)	0.165 (0.157)	0.0917 (0.197)	0.640* (0.345)	0.364*** (0.0410)	-0.109 (0.140)	0.290** (0.117)
L. Polity	0.113* (0.0630)	1.719* (1.043)	0.175 (0.124)	0.0772*** (0.0283)	-0.0160 (0.0471)	0.206** (0.0851)	0.0344*** (0.0125)	0.0359 (0.0328)	-0.0117 (0.0282)
L. Polity square	-0.00953 (0.00639)	0.111 (0.114)	-0.0292* (0.0172)	-0.0207*** (0.00694)	-0.00477 (0.0118)	-0.0386* (0.0214)	-0.00848*** (0.00223)	-0.0198*** (0.00734)	-0.0126*** (0.00579)
Transitional and interregnum regimes	0.760 (0.601)	-14.76*** (2.445)	1.038 (1.316)	0.446 (0.532)	-0.207 (0.858)	-0.482 (1.036)	0.677** (0.336)	0.0365 (0.564)	0.869* (0.503)
Constant	-7.691*** (2.291)	-128.6 (97.69)	-12.26 (8.336)	-4.457* (2.718)	-0.385 (4.339)	-10.92* (6.259)	-8.412*** (0.832)	0.0913 (2.430)	-11.23*** (2.315)
Decadal dummies	Yes			Yes					
Regional dummies	Yes			Yes					
N	635			712			3683		

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

Table 7 Multinomial Logit: Youth Bulges and Economic Stagnation

	Below 1% pc GDP Growth			Above 1% pc GDP Growth			All		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % of pop. above 15	0.0105 (0.0315)	0.137** (0.0597)	0.208** (0.0917)	-0.0357*** (0.0122)	-0.00914 (0.102)	0.0394 (0.0372)	0.00177 (0.0117)	-0.0357 (0.0399)	0.0562* (0.0337)
L. Youth unemployment	0.0205*** (0.00795)	-0.0590*** (0.0159)	0.0109 (0.0199)	-0.00939 (0.00687)	-0.0411 (0.0683)	-0.00850 (0.0150)	0.00503 (0.00454)	-0.0324** (0.0130)	0.0114 (0.00960)
Years since the last war	0.0101 (0.00722)	-0.0238 (0.0193)	0.0118 (0.0221)	-0.00363 (0.00419)	-0.0632** (0.0308)	-0.0215* (0.0118)	0.00235 (0.00289)	-0.0410*** (0.0134)	-0.000836 (0.00861)
Number of riots in the past 5 years	0.111*** (0.0325)	0.171*** (0.0510)	0.170*** (0.0435)	0.138*** (0.0319)	0.179*** (0.0393)	0.124*** (0.0367)	0.136*** (0.0209)	0.167*** (0.0306)	0.140*** (0.0271)
Number of previous wars	0.0554 (0.0995)	-0.382* (0.216)	0.0566 (0.261)	0.0458* (0.0248)	-0.254 (0.206)	-0.0837 (0.0623)	0.0489** (0.0241)	-0.151 (0.107)	0.0170 (0.0526)
GDP per capita growth (annual %)	-0.0636*** (0.0212)	-0.0742** (0.0345)	-0.0920** (0.0411)	-0.129*** (0.0283)	-0.285* (0.165)	0.0270* (0.0142)	-0.0440*** (0.0163)	-0.0780*** (0.0162)	-0.0308 (0.0340)
L. Rent to GDP	-4.739** (2.384)	6.960* (4.219)	4.390 (6.876)	2.189 (1.746)	13.77 (8.838)	7.988* (4.268)	-1.166 (1.131)	2.668 (3.418)	4.520* (2.797)
L. Rent to GDP square	6.814* (3.687)	-6.430 (6.643)	-6.937 (9.727)	-2.085 (3.691)	-32.28 (23.88)	-10.93 (8.562)	2.362 (2.074)	-4.916 (7.097)	-6.732 (5.050)
Natural log of population	0.375*** (0.0920)	-0.0761 (0.215)	-0.145 (0.280)	0.335*** (0.0528)	0.000510 (0.260)	0.503*** (0.151)	0.364*** (0.0410)	-0.109 (0.140)	0.290** (0.117)
L. Polity	0.0111 (0.0290)	0.146** (0.0596)	0.0421 (0.0897)	0.0476** (0.0154)	0.0756 (0.0887)	-0.0169 (0.0332)	0.0344** (0.0125)	0.0359 (0.0328)	-0.0117 (0.0282)
L. Polity square	-0.00451 (0.00498)	-0.0322** (0.0125)	-0.0241* (0.0132)	-0.0141*** (0.00310)	-0.0249 (0.0204)	-0.00535 (0.00870)	-0.00848*** (0.00223)	-0.0198*** (0.00734)	-0.0126*** (0.00579)
Transitional and interregnum regimes	0.709 (0.471)	-0.971 (0.846)	1.787* (0.928)	0.659 (0.757)	3.071* (1.622)	-24.80*** (0.771)	0.677** (0.336)	0.0365 (0.564)	0.869* (0.503)
Constant	-9.556*** (1.956)	-20.16*** (3.529)	-25.06*** (5.162)	-5.290*** (0.990)	-2.166 (6.008)	-13.31*** (3.467)	-8.412*** (0.832)	0.0913 (2.430)	-11.23*** (2.315)
Decadal dummies		Yes	No		No			Yes	
Regional dummies		Yes	No		No			Yes	
N	681			1895			3683		

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

7. Robustness checks

All the tables presenting the robustness checks are presented in the Appendix of the paper. 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 8 replicate the results from table 4 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 8 where the partial derivative of civil wars w.r.t. youth bulges and youth bulges square yields 20.5%. Such underestimation of the youth bulge causes an overestimation in the associated probabilities of civil wars. Comparing the first panel in tables 4 and 8 we see that a 1% increase in Huntington's measure of youth bulges is correlated with a 10% increase in the probability of civil war onset, compared to only 7% when using the population above 15 as the reference group.

As analyzing the impact of youth bulges on political violence is affected by regime types, it is imperative to control for the political setup of countries, and hence the Polity2 score was used in this paper. In order to test for the robustness of the estimation results discussed above an alternative measure of democracy 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 9 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 9 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 4 and 9, a 1% increase in youth bulges increase the likelihood of civil onset by 5% when using the V-Dem data compared to 7% when using the Polity2 index. In terms of other covariates both specifications are almost identical.

8. 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's contribution is twofold. 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 and mechanisms under which youth bulges influence riots, coups and civil wars? To address these two questions, availability and cost of recruiting participants, 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 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 coup attempts and civil wars in all most all specifications. While significantly reducing the likelihood of popular discontent in the form of riots in relatively progressing countries in terms of per capita GDP growth. 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 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 (see figure 5) and per capita GDP growth is low. 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 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 and ethnic one too, to the heterogeneity analysis done in this paper to better inform policy makers.

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10. Appendix A

Table 8 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.	0.00522 (0.0194)	-0.0755 (0.0544)	0.0950* (0.0516)	-0.123 (0.136)	1.752** (0.788)	0.932 (0.674)
Youth bulge square				0.00374 (0.00389)	-0.0488** (0.0208)	-0.0227 (0.0184)
Years since the last war	0.000859 (0.00260)	-0.0518*** (0.0104)	0.00312 (0.00613)	0.000678 (0.00261)	-0.0513*** (0.0105)	0.00408 (0.00610)
Number of riots in the past 5 years	0.0963*** (0.0134)	0.0737*** (0.0192)	0.0821*** (0.0170)	0.0963*** (0.0134)	0.0747*** (0.0194)	0.0817*** (0.0170)
Number of previous wars	0.0216 (0.0217)	-0.0164 (0.0504)	-0.00173 (0.0494)	0.0229 (0.0218)	-0.0285 (0.0509)	0.000178 (0.0490)
GDP per capita growth (annual %)	-0.0481*** (0.0108)	-0.0639*** (0.0125)	-0.0523*** (0.0168)	-0.0478*** (0.0107)	-0.0638*** (0.0128)	-0.0524*** (0.0164)
L. Rent to GDP	-1.498 (0.939)	-2.460 (2.037)	4.370** (2.198)	-1.453 (0.941)	-2.776 (2.053)	4.157* (2.209)
L. Rent to GDP square	2.319 (1.775)	1.600 (4.233)	-7.158* (4.193)	2.274 (1.775)	1.963 (4.237)	-6.970* (4.195)
Natural log of population	0.416*** (0.0339)	0.0725 (0.0811)	0.252*** (0.0722)	0.415*** (0.0339)	0.0595 (0.0827)	0.247*** (0.0724)
L. Polity	0.0179** (0.00821)	-0.0200 (0.0182)	0.000711 (0.0195)	0.0182** (0.00821)	-0.0195 (0.0183)	0.00208 (0.0195)
L. Polity square	-0.00703*** (0.00164)	-0.0158*** (0.00359)	-0.0122*** (0.00368)	-0.00707*** (0.00164)	-0.0152*** (0.00357)	-0.0116*** (0.00366)
Transitional and interregnum regimes	1.031*** (0.256)	0.766* (0.406)	1.176*** (0.384)	1.037*** (0.256)	0.756* (0.406)	1.168*** (0.383)
Constant	-8.613*** (0.711)	-1.362 (1.644)	-9.351*** (1.642)	-7.529*** (1.320)	-18.01*** (7.604)	-16.90*** (6.105)
Decadal dummies	Yes					
Regional dummies	Yes					
N	5922					

Robust standard errors in parentheses

+ p < 0.11, * p < 0.10, ** p < 0.05, *** p < 0.01

Table 9 Youth Bulges and Liberal Democracy

	Youth bulge			Youth bulge square		
	Riots	Coup attempts	Civil wars	Riots	Coup attempts	Civil wars
Youth bulge (15-24), % above 15	0.00472 (0.00942)	-0.0128 (0.0243)	0.0453** (0.0228)	-0.0495 (0.0476)	0.347* (0.195)	0.228* (0.142)
Youth bulge square				0.00101 (0.000865)	-0.00593** (0.00303)	-0.00317 (0.00233)
Years since the last war	0.00164 (0.00268)	-0.0510*** (0.0108)	0.00793 (0.00642)	0.00148 (0.00269)	-0.0517*** (0.0108)	0.00765 (0.00633)
Number of riots in the past 5 years	0.0948*** (0.0132)	0.0714*** (0.0189)	0.0829*** (0.0168)	0.0954*** (0.0133)	0.0702*** (0.0190)	0.0821*** (0.0168)
Number of previous wars	0.0191 (0.0221)	-0.0259 (0.0529)	0.0141 (0.0475)	0.0214 (0.0223)	-0.0292 (0.0535)	0.0102 (0.0470)
GDP per capita growth (annual %)	-0.0417*** (0.0116)	-0.0585*** (0.0116)	-0.0483*** (0.0162)	-0.0409*** (0.0116)	-0.0582*** (0.0119)	-0.0484*** (0.0159)
L. Rent to GDP	-1.814* (0.928)	-3.042 (2.054)	3.761* (2.219)	-1.703* (0.930)	-3.326* (2.049)	3.536 (2.221)
L. Rent to GDP square	3.067* (1.716)	2.512 (4.124)	-6.340 (4.140)	2.951* (1.715)	2.764 (4.119)	-6.192 (4.147)
Natural log of population	0.431*** (0.0330)	0.0708 (0.0816)	0.267*** (0.0720)	0.430*** (0.0331)	0.0674 (0.0818)	0.268*** (0.0719)
L. Liberal democracy index	2.336*** (0.697)	2.369 (2.336)	4.060** (1.843)	2.477*** (0.706)	2.443 (2.466)	3.807** (1.893)
L. Liberal democracy index square	-3.097*** (0.814)	-7.813* (4.212)	-7.441*** (2.462)	-3.271*** (0.826)	-7.838* (4.525)	-6.931*** (2.577)
Transitional and interregnum regimes	1.246*** (0.243)	1.025*** (0.365)	1.399*** (0.361)	1.253*** (0.242)	1.010*** (0.369)	1.395*** (0.361)
Constant	-9.510*** (0.639)	-3.015** (1.494)	-10.09*** (1.396)	-8.836*** (0.860)	-8.271** (3.494)	-12.62*** (2.367)
Decadal dummies	Yes					
Regional dummies	Yes					
N	5958			5958		

Robust standard errors in parentheses

+ p < 0.11, * p < 0.10, ** p < 0.05, *** p < 0.01

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