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Paper No. 14 / July 2004

The Devil in the Demographics: The Effect of Youth Bulges on Domestic Armed Conflict, 1950-2000

Henrik Urdal

CPR

Summary Findings

It has been suggested that large youth cohorts, so-called 'youth bulges', make countries more unstable in general, and thus more susceptible to armed conflict. In the present study this notion is put to an empirical test. The paper explores possible links between youth bulges and violent conflict theoretically and attempts to model under what conditions and in what kind of contexts youth bulges can cause armed conflict. The research hypotheses are tested in an event history statistical model covering a high number of countries and politically dependent areas over the period 1950–2000. The study finds robust support for the hypothesis that youth bulges increase the risk of domestic armed conflict, and especially so under conditions of economic stagnation. Moreover, the lack of support for the youth bulge hypothesis in recent World Bank studies is found to arise from a serious weakness in the youth bulge measure employed by World Bank researchers.

The author finds no evidence for the claim made by Samuel P. Huntington that youth bulges above a certain 'critical level' make countries especially prone to conflict. The study, however, provides evidence that the combination of youth bulges and poor economic performance can be explosive. This is bad news for regions that currently exhibit both features, often in coexistence with intermediary and unstable political regimes, in particular Sub-Saharan Africa and the Arab world. In addition to economic performance, a key factor that affects the conflict potential of youth bulges is the opportunity for migration. Migration works as a safety valve for youth discontent.

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Henrik Urdal

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Conflict Prevention & Reconstruction
Social Development Department
The World Bank
1818 H Street, NW
Washington, DC 20433

Fax: 202-522-3247
Web : http://www.worldbank.org/conflict (see "Publications" in the navigation menu)
E-mail: cpr@worldbank.org

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Foreword

It has long been argued that youth bulges may cause conflict and violence. After September 11, there has been increasing popular attention on youth bulges as a possible explanation for terrorism and increased global insecurity. The Bank's work on the economics of conflict initially found that large proportions of young men in a country increased the risk of conflict. Subsequent versions of the Collier-Hoeffler model, however, did not find significant effects from the youth bulge.

This paper explores links between youth bulges and violent conflict, and attempts to model under what conditions youth bulges can lead to conflict. The work is part of the Governance of Natural Resources Project, funded by the Norwegian Trust Fund for Environmentally and Socially Sustainable Development. The Project is exploring the links between natural resources and conflict, including the security implications of population pressure and resource scarcity.

Henrik Urdal is a researcher at the International Peace Research Institute, Oslo (PRIO). His most recent publications include "Accounting for Genocide: How Many Were Killed in Srebrenica?" European Journal of Population (2003) 19(3) with H. Brunborg and T. H. Lyngstad; and "People vs Malthus: Population Pressure, Environmental Degradation and Armed Conflict Revisited", presented at the 44th Annual Convention of the International Studies Association (ISA), Portland, 25 February-1 March, 2003 (forthcoming in the Journal of Peace Research, Vol. 45, 2005). He can be contacted at henriku@prio.no. The data set for this study is available at: www.prio.no/cwp/datasets.asp

Ian Bannon
Manager
Conflict Prevention and Reconstruction Unit

THE DEVIL IN THE DEMOGRAPHICS: THE EFFECT OF YOUTH BULGES ON DOMESTIC ARMED CONFLICT, 1950-2000

1. INTRODUCTION

> *In cities in six West African countries I saw [...] young men everywhere – hordes of them. They were like loose molecules in a very unstable social fluid, a fluid that was clearly on the verge of igniting* (Kaplan, 1994: 46).

> *The Arab world has a problem with its Attas in more than one sense. Globalization has caught it at a bad demographic moment. Arab societies are going through a massive youth bulge, with more than half of most countries' populations under the age of 25* (Zakaria, 2001: 24).

Armed conflicts pose a great risk to a large number of peoples' lives and well-being around the world. Internal armed conflicts are far more frequent than interstate conflicts. While there was an increase in the number of internal conflicts immediately after the end of the Cold War, such conflicts now occur approximately as frequently as for the late Cold War period. In 2001, 33 internal armed conflicts with more than 25 battle-related casualties took place in 28 different countries. Eleven conflicts inflicted more than 1,000 battle casualties (Gleditsch et al., 2002). Explanations for the outbreak of conflicts are diverse. The purpose of this study is to test claims that youth bulges – extraordinary large youth cohorts relative to the adult population – may be causally linked to internal armed conflict. Youth bulges are believed to strain social institutions such as the labor market and the educational system, thereby causing grievances that may result in violent conflict.

While the claim that youth bulges may cause violent conflict has a long history (Choucri, 1974; Moller, 1968), the issue has received increasing attention over the last decade following the more general debate over security implications of population pressure and resource scarcity. Despite its long history, claims proliferate that youth bulges and other demographic factors have become *more important* after the end of the Cold War. In the article 'The Coming Anarchy', Robert Kaplan argues that anarchy and the crumbling away of nation states will be attributed to demographic and environmental factors in the future (Kaplan, 1994: 46). In a statement to the Senate Committee on Intelligence held in 1997, the Director of the Defense Intelligence Agency Patrick M. Hughes argued that despite the lack of a 'peer competitor' to the US after the end of the Cold War, 'the world remains a very dangerous and complex place and there is every reason to expect US military requirements at about the same level of the past several years' (Hughes, 1997: 11). When listing the conditions that he believed would continue to make the world a dangerous place, the existence of youth bulges was his first point (ibid.: 2).

More so, after September 11, 2001 youth bulges have become a popular explanation for current political instability in the Arab world and for recruitment to international terrorist networks. In a background article surveying the root causes of the NY terrorist attacks, *Newsweek* editor Fareed Zakaria argues that youth bulges combined with small economic and social change has provided a fundament for an Islamic resurgence in the Arab world (Zakaria, 2001: 24). Also commenting on September 11, Samuel P. Huntington argues that his clash of civilizations hypothesis depends on the existence of youth bulges:

> *I don't think Islam is any more violent than any other religions, and I suspect if you added it all up, more people have been slaughtered by Christians over the centuries than by Muslims. But the key factor is the demographic factor. Generally speaking, the people*

> *who go out and kill other people are males between the ages of 16 and 30. During the 1960s, 70s and 80s there were high birth rates in the Muslim world, and this has given rise to a huge youth bulge. But the bulge will fade. Muslim birth rates are going down; in fact, they have dropped dramatically in some countries.*[1]

2. DEMOGRAPHIC VIOLENCE

One of the leading theorists on the role of youth in political violence, Jack A. Goldstone, claims that:

> *Youth have played a prominent role in political violence throughout recorded history: and the existence of a 'youth bulge' (an unusually high proportion of youths 15–25 relative to the total population) has historically been associated with times of political crisis* (Goldstone, 2001: 95).

Among prominent historical events that have been linked to the existence of youth bulges is the role played by the historically large youth cohorts (caused by the rapid decline in infant mortality some 20 to 30 years earlier) in the French revolution of 1789, and the importance of economic depression hitting the largest German youth cohorts ever in explaining the rise of Nazism in Germany in the 1930s (Moller, 1968: 240–244).

Some theorists have proposed that youth cohorts may develop a generational consciousness, and especially so out of awareness of belonging to a generation of an extraordinary size and strength, enabling them to act collectively (Braungart, 1984; Feuer, 1969; Goldstone, 1999). However, violent conflict between groups only divided by age are rare. The generational approach has some serious shortcomings with regard to the explanatory power of the relationship between youth bulges and violence. The development of generational consciousness may explain the formation of youth movements that can function as identity groups. Identity groups are necessary for collective violent action to take place. But it is not necessary that identity groups are generation-based for youth bulges to increase the likelihood of armed conflict. Furthermore, the generational approach does not offer explanations for the motives of youth rebellion nor does it provide a sufficient explanation for the opportunities of conflict. It is clear that if large youth bulges that hold a common generational consciousness would always produce conflict, we would have seen a lot more violent youth revolts. Conditions that provide youth bulges with the necessary motives and opportunities for armed conflict will be discussed below. As a general starting point, I assume that:

> **Hypothesis 1: Countries that experience youth bulges are more likely to experience domestic armed conflict than countries that do not.**

Youth Grievances

Figure 1 provides a model for the assumed relationship between youth bulges and armed conflict. The model assumes that youth bulges are likely to experience unemployment because they increase the supply of labor substantially when entering the labor market. Unemployment is believed to cause grievances, and especially so if expectations are raised through expansions in education. Similarly, grievances arise if possibilities to influence the political system and attain elite positions are limited.

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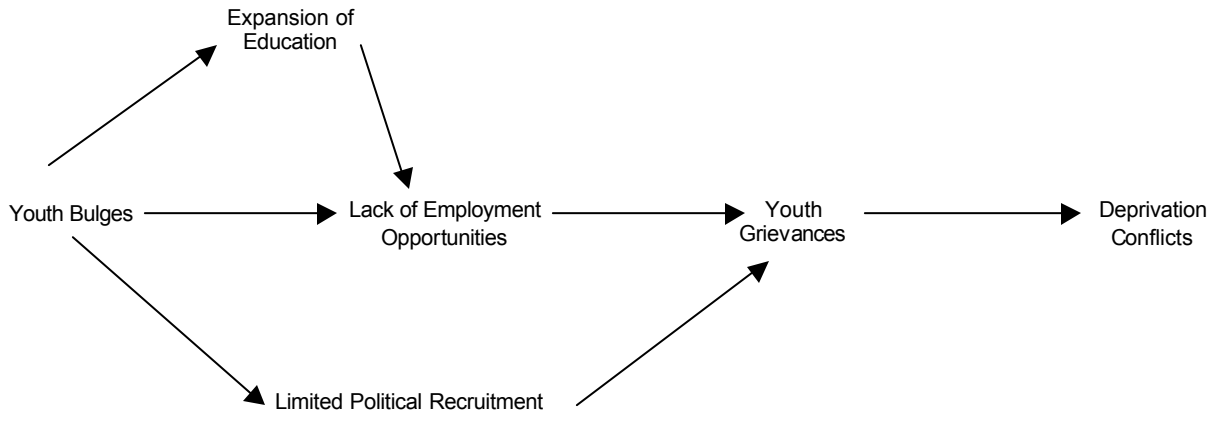
[1] 'So, are civilizations at war?', Interview with Samuel P. Huntington by Michael Steinberger, *The Observer*, Sunday October 21, 2001.

Figure 1**: Youth Bulges as a Source of Armed Conflict**



The first interaction effect I address is that of youth bulges and employment opportunities. Generations that are considerably larger than their parents' generations are likely to run into several societal 'bottlenecks', straining social institutions. And most theoretical works concerned with youth bulges point to limited absorption capacity of the labor market as the most important factor for causing grievances among youth.

If young people on a greater scale are kept out of the labor market this is likely to cause dissatisfaction and grievance. Unemployment is normally greater among younger than older cohorts in most societies, and youth bulges put an additional strain on the labor market. If the ability of the market to absorb a sudden surplus of young job seekers is limited, a large pool of young unemployed and frustrated people arises. The absorption capacity of the labor market depends heavily on the degree of diversification and flexibility of the economy. Youth bulges will be especially vulnerable to unemployment if they coincide with periods of serious economic decline, as those entering the labor market most recently usually are the most likely to experience unemployment. Choucri (1974: 73) believes that such coincidences generate despair among young people that moves them towards the use of violence. The belief in the 'system' is eroding:

> *Unemployment in any society weakens the political system's legitimacy and stability. Such conditions produce a climate of radicalism particularly among unattached youth who have the least to lose in the gamble and struggle for revolutionary gain* (Braungart, 1984: 16).

Focusing less on possible grievances, Paul Collier (2000: 94) assumes that the willingness of young men to join a rebellion depends on their other income-earning opportunities. If young people are left with no alternative but unemployment and poverty, they are likely to join a rebellion as an alternative way of generating an income. For a rebel force to initiate a rebellion Collier assumes that the rebel force must grow rapidly, and that the likelihood it will succeed is much smaller if there is a relatively tight labor market (Collier and Hoeffler, 2001: 6). What Collier holds in common with proponents of the grievance perspective is that unemployment reduces the cost for young people to engage in conflict, which makes it easier to overcome collective-action problems. The less opportunities for young people to get a job, the more likely is it that they engage in violent conflict. Since general economic performance of a country is usually strongly influencing employment opportunities, I assume that:

> **Hypothesis 2: The less economic growth a country experiences, the stronger is the conflict-conducive effect of youth bulges.**

The way that employment opportunities influence the conflict potential of youth bulges is strongly linked to the level of education. Goldstone (2001: 95) argues that a rapid increase in the number of educated youth seems to precede episodes of political upheaval. Well-educated youth have often been observed in central positions in episodes of riots, more recently student groups have entered the streets of Jakarta, Teheran, Belgrade and Harare demanding democratic reforms. One reason why students would want to revolt is if their aspirations of employment and political influence are not met. Choucri speculates that "the greater the unemployment among the educated youth, the greater are the propensities for dissatisfactions, instability, and violence" (1974: 73). Braungart (1984: 16) observes that:

> *The underemployment and unemployment prospects for university educated youth in many developing countries, as well as in more advanced developed countries, enlarge the reservoir of latent rebellion from which revolutionary politics can be drawn.*

But why should educated youth be more aggrieved by unemployment than uneducated youth? Collier (2000) argues that there is reason to expect that a higher level of education among men rather reduces the risk of conflict, resulting from the higher opportunity cost of rebellion for educated men. Since educated men have better income-earning opportunities than the uneducated, they would have more to loose and would then be less interested in joining a rebellion.

Collier's argument illustrates that the role of education in causing grievance is not straightforward. Collier is right that education increases the value of a person's labor, but it also raises this person's expectation of a relatively high income. This means that educated youth experience a greater gap between expectations and actual outcome if they face unemployment. Kahl (1998: 103) argues that the high expectations among educated urban youth in Kenya caused frustration and anti-state grievance when unemployment hit this group at the end of the 1980s. This illustrates that the opportunity cost of system maintenance is highest for those with high education, making it more rational for educated youth to take part in rebellions than for uneducated youth.

Collier is right, I believe, to argue that a high level of educational attainment in a society generally reduces the risk of conflict. But inflexible developing economies are unlikely to be able to absorb a sudden rapid increase in the number of educated youth. So when youth bulges go along with rapid expansions of education this is likely to be a potential for youth grievances. Braungart (1984: 14–15) finds that the most explosive episode of violence in Sri Lanka (1971) happened in a situation with a great increase in youth cohorts in the context of a rapid expansion of education and rising unemployment.[2]

The second interaction I investigate is that of youth bulges and regime type. Regime characteristics may provide the incentives for youth to riot against the government, as autocratic regimes are likely to have a very closed recruitment process both for political and economic positions (Goldstone 2001).[3] Level of education is important also to this argument; I assume that educated youth may engage in violent conflict behavior if their expectations of influence in society and access to elite positions are not met. This may be one explanation for recent episodes of violence initiated by students in Myanmar, Iran, China and Zimbabwe. This argument is in itself not dependent on the existence of a youth bulge, youth can be deprived of elite positions even though they are relatively few. But if the youth make up a large share of

[2] Unfortunately, data on educational attainment is too sparse to allow a direct testing of the relationship between youth bulges, level of education and conflict onset in the present analysis.

[3] Note that I separate the interaction effect between regime type and youth bulges from the general filtering effect of state weakness of which I argue below. The former represents a cause for youth bulges to rebel while the latter is a factor that influences the likelihood that a latent conflict will turn into a violent conflict, no matter what the root cause of the conflict is.

the adult population they are more likely to succeed in causing a violent clash with the government. I thus assume that:

> **Hypothesis 3: The conflict-conducive effect of youth bulges is stronger in autocratic countries than in democracies.**

Opportunities for Youth Violence

The underlying main argument why youth bulges create opportunities for violent conflict lies in the sheer number of individuals that make up the bulge. Relative to previous generations, the pool of potential rebels increases. And since large youth cohorts stretch the limits of social institutions such as the labor market, youth bulges in themselves are likely to produce more aggrieved individuals. But the existence of serious grievances is not sufficient for collective violent action to erupt. What can explain how aggrieved youth become rebellious youth?

In general, youth seem to be more available to participate in violent conflict than older people. This has to do with both cultural and structural factors. Huntington (1996: 117) argues that ”young people are the protagonists of protests, instability, reform, and revolution”, suggesting that youth generally have a natural urge for change. Also focusing on the troublesome idealism of the young, Goldstone (2001: 95) claims that large youth groups can cause conflict because they are more easily attracted toward new ideas and religions and thereby challenge traditional forms of authority. In addition to being more open to change, young people generally have fewer responsibilities for families and careers and ”are simply free, to a unique degree, of constraints that tend to make activism too time consuming or risky for other groups to engage in” (Goldstone, 1999: 3). In economic terms, the cost of recruiting young people to rebel movements is relatively low since the opportunity cost for a young person generally is low (Collier, 2000: 94).

The existence of objective deprivation, the mere fact that people are poor, seldom produces strong grievances. Rather, violent conflicts may erupt from cases of ‘relative deprivation’ (Gurr, 1970). Individuals and groups can experience relative deprivation when they perceive a gap between the situation they believe they deserve and the situation that they have actually achieved. But the deprivation hypothesis significantly overpredicts the likelihood that violent conflict occurs from grievance, and is thus not sufficient to explain the incidence of such an event (Kahl, 1998: 83). Two other factors need to be present for grievances to cause violent conflict.

First, a strong collective identity is a precondition for people to act violently in response to grievances. Since generational consciousness in itself is insufficient as a strong identity marker, other forms of social segmentation need to be present for youth grievances to increase the risk of violent conflict. Some empirical evidence suggest that ethnicity is the form of social segmentation that is most likely to be transformed into a manifest, violent conflict as a result of the existence of youth bulges. Huntington argues that the existence of large youth bulges account for many of the intercivilizational conflicts in the late twentieth century (1996: 261). He holds that the most serious episodes of ethnic violence in Sri Lanka have taken place in periods when the rioting ethnic groups have had their youth bulge peaks (1996: 259–260). Furthermore, Esty et al. (1998: 3) claim that their empirical study shows that the risk of ethnic conflict in a country greatly increases by the presence of a youth bulge.

Second, if the political and economic structures fail to give groups opportunities to raise demands peacefully, it becomes more rational to react violently to grievances. The likelihood that such violence shall succeed depends largely on the strength of the state. A state characterized by notorious instability and disintegration, a feature often referred to as *state weakness*, is more likely to offer opportunities for violence than a stark and authoritarian state (Goldstone, 2001; Homer-Dixon and Blitt, 1998).

3. RESEARCH DESIGN

This study takes the form of a Large-N quantitative survey. The unit of analysis is the country-year and the dependent variable is dichotomous, taking the value 1 for the event conflict onset, and 0 for the non-event, years with peace. With a dichotomous dependent variable, logistic regression is chosen as statistical method.

Included in the analysis are all sovereign states in the international system and all politically dependent areas (colonies, occupied territories and dependencies) for the whole period 1950–2000.[4] Only dependent areas with an estimated minimum total population of 150,000 in 1995 are included. The reason for this is that annual population data are not available in UN (1999) for dependencies with smaller populations. The reason for the temporal restriction is that demographic estimates are generally far more unreliable prior to 1950. Additionally, the conflict data analyzed only go back to 1946. The demographic data used in this study originate from the UN population indicators (UN, 1999), and are supplemented with information from *Demographic Yearbook* (UN, annual), and *Statistical Abstract of the World* (Reddy, 1994).

4. PREVIOUS EMPIRICAL WORK

The first comparative empirical study of the role of youth bulges in armed conflict was undertaken by Nazli Choucri (1974). By comparing qualitative case studies of 45 'local conflicts' but not comparing these with any control cases, she found that the existence of large youth cohorts did play a minor role in ten conflicts, but was never a crucial factor in the initiation of these conflicts. I am only familiar with two large-N quantitative studies of the effect of youth cohorts on violent conflict. Collier (2000: 97) finds that large proportions of young men in a society increases, although only marginally, the likelihood of civil war. In a later study, however, Collier and Hoeffler (2001: 16) fail to find significant effects of youth bulges. Esty et al. (1998) test the effect of large youth cohorts for several categories of 'state failures' for the period of 1955–94, and find that youth bulges significantly increase the likelihood that a country will experience what they characterize as 'ethnic conflict'.

Both these studies have serious shortcomings. The youth bulge measure in Collier (2000) and Collier & Hoeffler (2001) is not satisfactorily operationalized, while Esty et al. (1998) have been criticized both for their sampling methods of conflict and control cases (King & Zeng, 2001), and for their rather wide concept of 'state failure' (Hauge & Ellingsen, 2001: 57).

5. OPERATIONALIZATIONS

Armed Conflict Onset

The dependent variable is onset of domestic armed conflict, and data are drawn from the Uppsala dataset (Gleditsch et al., 2002). This dataset has been published annually in *Journal of Peace Research* since 1993 but has only recently been extended beyond the post-Cold War period. Shorter series, mostly for the post-Cold War era, have been analyzed in earlier studies (de Soysa, 2002; Hauge and Ellingsen, 2001). In this study, conflict refers to domestic conflict *onset* unless specified otherwise. I include colonial wars in my operationalization of conflict, as I see no reason to treat armed conflicts between a liberation army and a present colonial power differently from any other form of internal riot directed toward an autocratic regime.

The Uppsala dataset defines a relatively low threshold for conflict, and distinguishes between minor armed conflict (a minimum of 25 battle-related deaths per year), intermediate armed conflict (at least 25 battle-related deaths per year and an accumulated total of at least 1,000 deaths, but fewer than 1,000 per

[4] For comparison, I will also run analyses on a more restricted sample of countries that qualify as members of the interstate system as defined by Small and Singer (1982).

year), and war (at least 1,000 battle-related deaths per year). In this analysis, I do not distinguish between different levels of conflict. According to the Uppsala criteria, an armed conflict is further defined as a contested incompatibility concerning government and/or territory, between at least two parties, of which one is the government of a state, using armed force (Wallensteen and Sollenberg, 2001: 643). A total of 207 conflict onsets from a state of peace are identified for the 1950-2000 period.

Youth Bulges

The literature suggests several ways to operationalize *youth bulges*. Some of these suggestions produce serious flaws that could easily jeopardize the possibilities of revealing effects of youth bulges on armed conflict. The operationalization producing the most serious flaw is suggested by many prominent theorists (Collier, 2000; Goldstone, 2001; Huntington, 1996). That is to measure the size of youth cohorts (most commonly defined as those between 15 and 24 years) relative to the total population rather than to the adult population.

First, this is questionable from a theoretical perspective. Most theories about youth revolt assume that conflicts arise from competition between younger and older cohorts, or because youth cohorts run into institutional 'bottlenecks' because they are more numerous than previous cohorts. Second, countries with rapidly growing populations will tend to have underestimated youth bulges because their under-15 populations are so large that this inflates the total population. To avoid this, I measure youth cohorts as 15–24 year-olds relative to the total adult population (15 years and above). Data on age distribution are drawn from the *World Population Prospects* (UN, 1999), and from the *Demographic Yearbook* (UN, annual) for small states. Among the 20 countries with the greatest youth bulges in 2000, 15 were in Sub-Saharan Africa. Three were in the Middle East; Gaza, Syria, and Yemen, while the remaining two were Guatemala and Nicaragua. Countries with exceptionally small youth cohorts include Monaco, Germany, Italy and Switzerland.

Huntington (1996: 259–261) argues that societies are particularly war prone when the number of young people aged 15-24 reaches a 'critical level' of 20% of the overall population in a country. To test whether the effect of youth bulges on conflict is non-linear, I will both run models with a threshold variable and alternatively including a squared term for youth bulges.

Control Variables

Existing conflict literature suggests a broad variety of other factors that can contribute to explain the incidence of domestic armed conflict. Level of *development* is a variable that has been found to strongly influence the likelihood of domestic armed conflict (Collier and Hoeffler, 1998; de Soysa, 2002; Hauge and Ellingsen, 2001; Hegre et al., 2001; Henderson and Singer, 2000). Development as a concept conveys a wide range of aspects, and there are many different, and often conflicting, theoretical explanations that aim to explain how and why societies grow more peaceful as they develop. de Soysa (2002: 406) focuses on the role of higher state revenues, following from higher income, which enable states to pacify, or crush opposition. Wealthy countries can also more easily redistribute resources in order to dampen dissatisfaction (Henderson & Singer, 2000: 281). On the individual level, increasing incomes means that the opportunity costs of potential rebels increase following from their possible earnings in the regular economy (de Soysa, 2002: 406).

In this study I apply a proxy variable that, compared to the widely used economic measures of GDP or energy consumption per capita, better capture the diverse aspects of development, namely the infant mortality rate (IMR).[5] Sen (1998) has argued that mortality is a good indicator of a country's level of

[5] For comparison, I will also use a measure of log-transformed GDP per capita based on information from the *World Development Indicators* (World Bank, 1999), the *Penn World Tables* (Summers and Heston, 1991) and the *CIA World Factbook* (CIA, annual).

development. The level of infant mortality in a society is highly dependent on both material living standards, levels of education, gender inequalities and health care systems. In addition to capturing non-economic aspects, IMR is not nearly as flawed by distributional effects. Another great advantage of IMR over other development proxies is its broad availability for the period studied here.[6] The IMR is defined as the fraction of live-born children who die before the age of one year. IMR data have been gathered from the *World Population Prospects* (UN, 1999), and the *Demographic Yearbook* (UN, annual) for small states.

A second control variable assumed to have a strong influence on the likelihood of domestic armed conflict is *regime* type. While the democratic peace argument is a well-known explanation of why democracies do not fight each other, democracy is also found to have a pacifying effect internally (Hegre et al., 2001). The impact of regime type is generally believed to take an inverted U-shaped form, meaning that stark autocracies and fully developed democracies are both less likely to experience conflict than intermediate and unstable regimes. Democratic regimes offer opportunities for peaceful voicing of grievances, while strong autocratic regimes will oppress all opposition attempts. Intermediary regimes are the weak states that neither offer democratic institutions, nor possess the oppressiveness of the autocracies. I use the Polity IV data (Marshall and Jaggers, 2000) to measure regime type, and the variable ranges from -10 (most autocratic) to 10 (most democratic). I also include a squared term in order to measure the assumed inverted U-shaped effect of regime on armed conflict.

I further include an indicator of *economic opportunities*. If economic opportunities are worsening through less wealth to share and rising unemployment, this is likely to cause grievances no matter the prior level of wealth. Economic opportunities is operationalized as the average annual change in GDP per capita over the five-year period prior to the year of observation. GDP per capita data have been gathered from the *World Development Indicators* (World Bank, 1999), the *Penn World Tables* (Summers and Heston, 1991) and the *World Factbook* (CIA, annual).

To account for differences in conflict propensity caused by comparing states of different sizes, a variable measuring *total population* size is included. The larger the size of a state's population the greater the likelihood of linguistic, religious, ethnic or cultural fractionalization, and also of larger geographical areas. Data are drawn from the *World Population Prospects* (UN, 1999), and from the *Demographic Yearbook* (UN, annual) for small states. The variable is log-transformed as I assume the size of the population to have a diminishing effect on conflict. I also include controls for political *dependency* status and *communist state dissolution.* Political dependency is introduced in models run with the full sample, and is a dummy variable coded 1 for political dependent areas, and 0 for sovereign states. The data were gathered from Gleditsch and Befring (1986), the *Encyclopedia Britannica* (Britannica, annual), and the *World Factbook* (CIA, annual). Communist state dissolution is a dummy variable coded 1 for all successor states of the Soviet Union and the Federal Republic of Yugoslavia for five years after their dissolution, and 0 otherwise.[7]

Control for Statistical Dependency

The initial assumption for a logistic regression is independence across all observations. This independence is not easily defended in this case. There is very likely to be dependence in time and possibly in space. An example of the latter is if an armed conflict in one country spread into another

[6] Given the high correlation between the measures of IMR and GDP per capita, data availability is probably the single most important argument for using IMR as a proxy for development.

[7] The rationale for including such a variable is the many conflicts in the successor states of the Soviet Union and the Federal Republic of Yugoslavia in the beginning of the 1990s that happened at a time when these countries experienced extremely small youth cohorts. Since there have been no suggestions that conflict in these post-communist states was attributable to high dependency burdens or other effects of small youth cohorts, I believe that the inclusion of a post-communist dummy variable will potentially capture effects of omitted variables that better explain this particular set of cases.

country to cause conflict there. The former is illustrated by the higher conflict probability of countries that have experienced conflict before, compared to countries with no conflict history (Gleditsch et al., 2002). More obviously, a country that experiences conflict over several years will find subsequent years of conflict to be heavily dependent on the first year. This latter problem is usually dealt with by omitting all observations of conflict, except for observations of the onset of conflict given that the country was at peace at t-1.

Omitting consecutive years of war does not solve the problem of time dependency entirely because the same statistical dependency prevails for consecutive years of peace. To account for temporal dependence, I will apply a control variable for time dependency measuring the number of years in peace since the previous conflict, termed *brevity of peace*.[8] It is generally assumed that the risk of experiencing a new conflict is high in the immediate time after an armed conflict, and that this risk diminishes as time goes by and wounds are healed. I follow Hegre et al. (2001) and assume that the effect of a previous conflict is decaying over time according to the formula exp{(-years in peace)/X}.[9] In the formula, 'years in peace' is the number of years since a country experienced an armed conflict, while the value on X decides at what rate the effect of a previous armed conflict on conflict proneness diminishes over time. In this study, the value chosen for X is 4, implying that the risk of conflict is halved approximately every 3 years.[10] The brevity of peace variable takes on values close to 1 immediately after the end of a conflict, while it comes closer to 0 as time goes by. For countries that have never experienced armed conflict in the period studied here, I assign the value 0.[11]

I also apply a control variable for dependence across events, counting the number of previous conflicts. The variable *previous conflict* is coded as the number of conflict onsets a country has experienced prior to a given year of observation. This reflects the assumption that grievances caused by prior armed conflict increases with the number of previous conflicts. The variable takes the value 0 for all countries that enter the dataset, and increases by one for each conflict onset that is coded.

6. EMPIRICAL RESULTS

Table 1 tests the effect of youth bulges on conflict propensity in a model containing the most important control variables, both for a restricted sample of independent states, and for all states and dependent areas in the international system. The results clearly support a hypothesis that large youth bulges increase the risk of armed conflict, both for the restricted and for the full sample. An increase in youth bulges of one percentage point is associated with an increased likelihood of conflict of around 7% (Model 1). Furthermore, countries experiencing youth bulges of 35% run three times the risk of conflict compared to countries with youth bulges equal to the median for developed countries, all other variables at mean.[12] Although not presented here, the substitution of IMR for a more conventional development indicator, a logtransformed measure of GDP per capita, leaves the results virtually unchanged.

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[8] I am grateful to Håvard Hegre for suggesting this term.

[9] This form of time-dependency control is very similar to that suggested by Beck, Katz and Tucker (1998). However, I prefer this approach as it is more directly interpretable than a set of splines. I have run all models with both time dependency controls, with almost identical results.

[10] This value for a half-life of conflict is also used by Toset et al. (2000).

[11] Since information on domestic armed conflict prior to 1945 is not available, the effect of the variable is systematically underestimated.

[12] In 2000, most developed countries including most of Western Europe, US, Canada and Japan, experienced youth bulges of 17% or below, while 44 developing countries experienced youth bulges of 35% or above.

Table 1: Risk of Armed Conflict by Youth Bulges 1950–2000

Explanatory Variables	Model 1 Restricted Sample[b]		Model 2 All Countries and Dependencies	
	ß st.e.	*p-value*[a] Exp(ß)	ß st.e.	*p-value*[a] Exp(ß)
Youth Bulges	0.066 (0.020)	***0.001*** 1.07	0.045 (0.017)	***0.010*** 1.05
Control Variables				
Total Population	0.228 (0.063)	***<0.0005*** 1.26	0.276 (0.050)	***<0.0005*** 1.32
Dependency			-0.485 (0.369)	*0.189* 0.62
Infant Mortality Rate	0.006 (0.002)	***0.003*** 1.01	0.006 (0.0016)	***<0.0005*** 1.01
Regime Type	0.019 (0.014)	*0.179* 1.02	0.018 (0.013)	*0.179* 1.02
Regime Type, Squared	-0.007 (0.003)	***0.019*** 0.99	-0.011 (0.003)	***<0.0005*** 0.99
Economic Opportunities	-0.061 (0.021)	***0.003*** 0.94	-0.054 (0.019)	***0.004*** 0.95
Missing Regime Data[c]			-0.142 (0.298)	*0.635* 0.87
Missing Economic Data[c]			-0.145 (0.253)	*0.568* 0.87
Previous Conflict	0.080 (0.086)	*0.349* 1.08	0.053 (0.078)	*0.499* 1.05
Brevity of Peace	2.024 (0.343)	***<0.0005*** 7.57	2.031 (0.300)	***<0.0005*** 7.62
Constant	-7.927 (0.969)	***<0.0005*** -	-7.527 (0.784)	***<0.0005*** -
N Log Likelihood Pseudo R^2	4,894 -602.46 0.120		7,658 -826.41 0.132	

[a] Effects that are significant at 0.05 level in bold.
[b] Including only independent states with a population of more than 500,000 (Small and Singer, 1982), and only states with original information on regime type and economic opportunities.
[c] To deal with the problem of missing values due to the large temporal-spatial domain covered by this study, I have assigned the value for the sample average for missing values on the regime and economic opportunities variables. In addition two dummy variables are included, *missing regime data* and *missing economic data* corresponding to the two variables. They take on the value 1 if information on the corresponding variable is originally missing from the dataset, and 0 otherwise. These dummy variables control for potential skewness caused by imputing the mean value, and can be interpreted as whether units that have been assigned the value for the sample average have a significantly different risk of conflict than units that originally takes on the value of the sample average, all other things being equal.

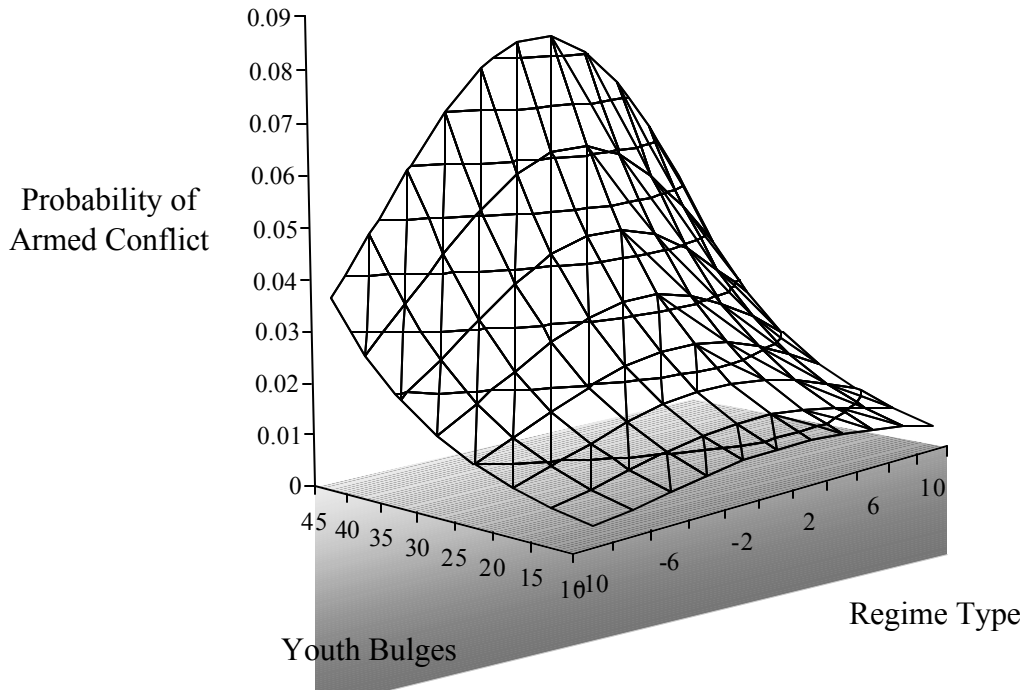
As expected, level of development as measured by the infant mortality rate is strongly significant[13] and positively related to armed conflict in both models, consistent with previous studies using economic indicators of development. If Sub-Sahara African countries would achieve a rise in level of development relative to a reduction in IMR from their present (2000) average level of approximately 90 to the present Western European average level of 6.4, this would reduce their conflict propensity by 40%, all other variables at mean. Type of political regime also seems to matter for armed conflict in a pattern consistent with previous studies. The statistically significant squared regime term suggest that there is indeed an

[13] I prefer to present full p-values rather than levels of significance in my models. The conventional levels of 5%, 1%, or 0.1% certainty of whether a statistical relationship holds for the universe of units are after all casually set, and strict adherence to such levels can potentially lead to the neglect of interesting relationships that do not meet formal criteria for statistical significance. In the text, unless other is stated, statistical significance refers throughout this study to p-values below 0.05. In this study I consequently report two-sided tests, although all hypotheses are stated as one-sided.

inversed U-shaped relationship between regime type and conflict, where intermediary regimes are more conflict prone than democracies and autocracies. The curve is not perfectly symmetric around the mean value 0, full-fledged democracies do have a slightly higher risk of conflict than stark autocracies. Countries with the value of +1 on the regime scale are most conflict prone.

Compared to the most conflict-exposed regimes, fully developed democracies (+10) are almost 40% less likely to experience a conflict, while consistent autocracies (-10) are 60% less exposed, all other variables at mean (all based on estimates in Model 1). The combined effect of youth bulges and regime type is graphically presented in Figure 2.

Figure 2: Probability of Armed Conflict as a Function of Youth Bulges and Regime Type, All Control Variables at Mean



The figure is based on estimates from Model 1, Table 1.

Furthermore, both total population size and economic opportunities are clearly associated with conflict propensity. Political dependencies do not seem to exhibit a significantly different risk of conflict than sovereign states, this holds when the missing regime data indicator is excluded from the model. None of the two indicators of missing data are statistically significant, indicating that units that have been assigned the mean values on the two variables do not exhibit a significantly different risk of conflict than units that originally have the mean value. The brevity of peace variable is clearly significant and positively related to conflict; immediately after the end of an armed conflict, a country is more than 7 times as likely to experience another conflict than countries that experienced conflict a long time ago or that never have experienced a conflict. A general finding from Models 1 and 2 is that extending the sample to include also smaller independent states in addition to political dependencies, does not alter the results.

Testing Huntington's Threshold Proposition

The models in Table 2 find no support for Huntington's argument that youth bulges above a certain level make countries especially conflict prone. The squared term for youth bulges in Model 3 is not significant,

indicating that the effect of youth bulges on conflict propensity is not increasing on higher values of youth bulges. The threshold variable introduced in Model 4, measuring Huntington's 'critical level' of youth bulges provides less explanatory power than a linear term.

Table 2: Testing Huntington's Threshold Proposition[a]

Explanatory Variables	**Model 3 Squared Youth Bulges** ß st.e.	*p-value*[b] Exp(ß)	**Model 4 Categorical Youth Bulges** ß st.e.	*p-value*[b] Exp(ß)
Youth Bulges[c]	0.066 (0.018)	***<0.0005*** 1.07		
Youth Bulges, Squared[c]	0.002 (0.002)	*0.302* 1.00		
Youth Bulges, Threshold (35%)			0.367 (0.171)	***0.032*** 1.44
Control Variables				
Communist State Dissolution	1.881 (0.469)	***<0.0005*** 6.56	1.522 (0.442)	***0.001*** 4.58
Total Population	0.279 (0.051)	***<0.0005*** 1.32	0.249 (0.049)	***<0.0005*** 1.28
Dependency	-0.444 (0.371)	*0.231* 0.64	-0.547 (0.368)	*0.137* 0.58
Infant Mortality Rate	0.007 (0.0017)	***<0.0005*** 1.01	0.009 (0.0015)	***<0.0005*** 1.01
Regime Type	0.021 (0.014)	*0.131* 1.02	0.016 (0.013)	*0.228* 1.02
Regime Type, Squared	-0.009 (0.003)	***0.002*** 0.99	-0.011 (0.003)	***<0.0005*** 0.99
Economic Opportunities	-0.030 (0.019)	*0.118* 0.97	-0.031 (0.019)	*0.103* 0.97
Missing Regime Data	-0.030 (0.302)	*0.920* 0.97	-0.044 (0.301)	*0.885* 0.96
Missing Economic Data	-0.271 (0.254)	*0.287* 0.76	-0.314 (0.252)	*0.213* 0.73
Previous Conflict	0.084 (0.078)	*0.283* 1.09	0.124 (0.077)	*0.105* 1.13
Brevity of Peace	1.862 (0.304)	***<0.0005*** 6.44	1.849 (0.303)	***<0.0005*** 6.35
Constant	-6.596 (0.521)	***<0.0005*** -	-6.301 (0.494)	***<0.0005*** -
N	7,658		7,658	
Log Likelihood	-818.60		-823.39	
Pseudo R^2	0.140		0.135	

[a] All states and dependent areas included.
[b] Effects that are significant at 0.05 level in bold.
[c] The youth bulge term is centered (standardized) in order to alleviate the potential problem of multicollinearity between the single and the squared terms (Kleinbaum, Kupper and Muller, 1998: 206-212).

The post communist dummy variable is included in Models 3 and 4 to control for unobserved explanatory variables that may explain conflicts in former communist states. The rationale for this is to control for a factor that could potentially conceal a curvilinear pattern of youth bulges on conflict propensity. However, despite this control, there is no support for such a hypothesis. Furthermore, the results for the youth bulge variables hold when communist state dissolution is excluded from the models. The dummy variable is clearly significant and positive, indicating that there are certainly aspects of the conflicts in post-communist states that are not captured in this model.

Consequences of Using Collier's Youth Bulge Measure

As argued above, I believe that the operationalization of the youth bulge variable is of great importance, and that an erroneous operationalization is a major reason for previous falsifications of the youth bulge hypothesis by Paul Collier and associates at the World Bank. In Table 3, my youth bulge variable is substituted for one measuring youth cohorts relative to the total population identical to that of Collier and associates (Collier, 2000; Collier and Hoeffler, 2001). Aside from this, the two models equal Models 1 and 3. This operation results in clearly insignificant results in both models, strengthening my suspicion that lack of support for the youth bulge hypothesis in recent World Bank studies is due to a flawed youth bulge measure.[14]

Table 3: Using Collier's Youth Bulge Measure

	Model 5[a] **Restricted Sample**		**Model 6**[b] **All Countries and Dependencies**	
Explanatory Variables	ß st.e.	*p-value*[c] Exp(ß)	ß st.e.	*p-value*[c] Exp(ß)
Youth Bulges[d]	0.084 (0.050)	*0.094* 1.09	0.084 (0.048)	0.079 1.09
Youth Bulges, Squared[d]			-0.019 (0.016)	0.261 0.98
Control Variables				
Communist State Dissolution			1.685 (0.461)	***<0.0005*** 5.39
Total Population	0.188 (0.061)	***0.002*** 1.21	0.247 (0.049)	***<0.0005*** 1.28
Dependency			-0.558 (0.367)	*0.129* 0.57
Infant Mortality Rate	0.008 (0.002)	***<0.0005*** 1.01	0.008 (0.002)	***<0.0005*** 1.01
Regime Type	0.014 (0.014)	*0.313* 1.01	0.017 (0.013)	*0.210* 1.02
Regime Type, Squared	-0.009 (0.003)	***0.005*** 0.99	-0.010 (0.003)	***<0.0005*** 0.99
Economic Opportunities	-0.061 (0.020)	***0.002*** 0.94	-0.033 (0.019)	*0.081* 0.97
Missing Regime Data			-0.036 (0.301)	*0.905* 0.96
Missing Economic Data			-0.320 (0.253)	*0.206* 0.73
Previous Conflict	0.115 (0.084)	*0.173* 1.12	0.101 (0.077)	*0.190* 1.11
Brevity of Peace	2.032 (0.343)	***<0.0005*** 7.63	1.915 (0.302)	***<0.0005*** 6.79
Constant	-7.191 (1.137)	***<0.0005*** -	-6.080 (0.491)	***<0.0005*** -
N	4,894		7,658	
Log Likelihood	-606.41		-823.39	
Pseudo R^2	0.114		0.135	

[a] Restricted sample.
[b] All states and dependent areas included.
[c] Effects that are significant at 0.05 level in bold.
[d] The youth bulge term is centered (standardized) in order to alleviate the potential problem of multicollinearity between the single and the squared terms.

[14] The two models presented here are the most favorable to Collier's youth bulge measure, under other specifications his measure produces even higher p-values.

How does Youth Bulges Matter?

If youth bulges increase the likelihood of conflict, can we say anything about how and why they matter? In Table 4, I include two interaction terms aimed at testing Hypotheses 2 and 3, arguing that youth bulges increase the risk of conflict especially under conditions of economic recession and autocratic regimes.

Table 4: Risk of Armed Conflict by Youth Bulges and Interaction Terms 1950–2000

	Model 7 Restricted Sample		**Model 8 All States and Dependent Areas**	
Explanatory Variables	ß st.e.	*p-value*[a] Exp(ß)	ß st.e.	*p-value*[a] Exp(ß)
Youth Bulges	0.059 (0.024)	***0.013*** 1.06	0.054 (0.021)	***0.010*** 1.06
(Youth Bulges x Negative Economic Growth)[b]	0.597 (0.300)	***0.046*** 1.82	0.848 (0.276)	***0.002*** 2.33
(Youth Bulges x Autocracy)[c]	-0.020 (0.255)	*0.939* 0.98	-0.134 (0.230)	*0.562* 0.87
Control Variables				
Communist State Dissolution	1.080 (0.676)	*0.110* 2.94	2.121 (0.462)	***<0.0005*** 8.34
Total Population	0.228 (0.063)	***<0.0005*** 1.26	0.276 (0.050)	***<0.0005*** 1.32
Dependency			-0.463 (0.371)	*0.212* 0.63
Infant Mortality Rate	0.006 (0.002)	***0.002*** 1.01	0.007 (0.002)	***<0.0005*** 1.01
Regime Type	0.019 (0.015)	*0.193* 1.02	0.019 (0.014)	*0.173* 1.02
Regime Type, Squared	-0.007 (0.003)	***0.031*** 0.99	-0.009 (0.003)	***0.002*** 0.99
Economic Opportunities	-0.032 (0.024)	*0.175* 0.97	-0.006 (0.020)	*0.770* 0.99
Missing Regime Data			-0.004 (0.303)	*0.989* 1.00
Missing Economic Data			-0.214 (0.255)	*0.402* 0.81
Previous Conflict	0.085 (0.087)	*0.325* 1.09	0.073 (0.079)	*0.356* 1.08
Brevity of Peace	1.963 (0.348)	***<0.0005*** 7.12	1.865 (0.303)	***<0.0005*** 6.46
Constant	-7.925 (1.028)	***<0.0005*** -	-8.186 (0.863)	***<0.0005*** -
N	4,894		7,658	
Log Likelihood	-599.43		-814.36	
Pseudo R^2	0.124		0.144	

[a] Effects that are significant at 0.05 level in bold.
[b] Dummy variable taking the value 1 for units with youth bulges greater than 35% of the adult population *and* negative economic growth, 0 otherwise.
[c] Dummy variable taking the value 1 for units with youth bulges greater than 35% of the adult population *and* a Policy score below +6, 0 otherwise.

The interaction term between economic opportunities and youth bulges is statistically significant both for the restricted and for the full sample, indicating that economic issues influence the conflict propensity of large youth cohorts. However, the interaction term employed here is a rather crude measure. An indicator that more directly captures the economic hardship of youth bulges, such as youth unemployment rates,

might have fared even better. The interaction term between youth bulges and regime type is far from statistically significant, indicating that the effect of youth bulges does not vary with level of democracy.[15]

A New Era of Youth-Generated Conflict?

Table 5 presents results from two models covering the Cold War and the post-Cold War periods for the full sample, revealing interesting differences. The effect of youth bulges is positive and clearly significant for the Cold War period. For the post-Cold War period, the effect of youth bulges is insignificant and negative. This holds when communist state dissolution is excluded from the model.

Table 5: Risk of Armed Conflict by Youth Bulges and Time Periods

	Model 9 Cold War Period (1950-89)		**Model 10 Post-Cold War Period (1990-2000)**	
Explanatory Variables	ß st.e.	*p-value*[a] Exp(ß)	ß st.e.	*p-value*[a] Exp(ß)
Youth Bulges	0.078 (0.024)	***0.001*** 1.08	-0.021 (0.033)	*0.527* 0.98
Control Variables				
Communist State Dissolution			1.133 (0.569)	***0.047*** 3.10
Total Population	0.278 (0.059)	***<0.0005*** 1.32	0.342 (0.102)	***0.001*** 1.41
Dependency	-0.725 (0.413)	*0.079* 0.48	0.007 (0.980)	*0.994* 1.01
Infant Mortality Rate	0.008 (0.002)	***<0.0005*** 1.01	0.021 (0.005)	***<0.0005*** 1.02
Regime Type	0.030 (0.016)	*0.070* 1.03	-0.001 (0.026)	*0.968* 1.00
Regime Type, Squared	-0.004 (0.004)	*0.223* 1.00	-0.018 (0.006)	***0.002*** 0.98
Economic Opportunities	-0.038 (0.026)	*0.142* 0.96	-0.019 (0.031)	*0.531* 0.98
Missing Regime Data	0.700 (0.371)	*0.059* 2.01	-1.345 (0.562)	***0.017*** 0.26
Missing Economic Data	-0.656 (0.330)	***0.047*** 0.52	0.319 (0.429)	*0.457* 1.38
Previous Conflict	0.187 (0.104)	*0.073* 1.21	-0.144 (0.130)	*0.270* 0.87
Brevity of Peace	1.222 (0.423)	***0.004*** 3.39	2.362 (0.480)	***<0.0005*** 10.61
Constant	-9.160 (1.065)	***<0.0005*** -	-6.514 (1.411)	***<0.0005*** -
N	5,929		1,729	
Log Likelihood	-538.32		-221.36	
Pseudo R^2	0.115		0.228	

[a] Effects that are significant at 0.05 level in bold.

The control variables behave very much like in Model 1. The general model including the suggested control variables seems to have the greatest explanatory power for the post-Cold War period, with an explained variance (pseudo R^2) double that of the Cold War period. Total population size, IMR, and brevity of peace are all statistically significant and positive in both periods. The inverse U-shaped relationship between democracy and conflict is only established empirically for the post-Cold War period,

[15] When I substitute this for an interaction term between youth bulges and intermediate regimes to see whether youth bulges increase the risk of conflict more in weak states, the term still fails to achieve statistical significance.

although the squared regime term has the expected negative sign also for the Cold War period. Interestingly, the missing regime data indicator is negative and clearly significant for the post-Cold War period. This holds when the dependency status variable is excluded from the model. This indicates that sovereign states that were assigned the Polity score 0 for this period did have a significantly lower risk of conflict than states that actually had the mean value of 0. A possible explanation could be that the rapid and large-scale 'third wave' of democratization in the 1990s is not fully captured by the assignment of Polity scores to this dataset.[16]

7. SUMMARY

Claims proliferate that certain demographic characteristics make countries more prone to armed conflict. The aim of this study has been to test empirically whether a demographic feature that has received increasing attention, youth bulges, is related to armed conflict. And it does seem to be a devil in this part of the demographics.

The overall conclusion is that youth bulges increase the risk that a country will experience domestic armed conflict. This finding is extremely robust, the youth bulge variable is positive and significantly related to conflict under all model specifications. However, I have found no evidence for the claim made by Samuel P. Huntington that youth bulges above a certain 'critical level' make countries especially conflict prone. My analysis further shows that the operationalization of the youth bulge variable matters a lot. When youth bulges are defined relative to total rather than the adult population, as in the work of Paul Collier and associates of the World Bank, there is no significant effect of the variable. The results also indicate that economic stagnation, but not regime type, may influence the conflict propensity of youth bulges.

Are we moving toward a new age of insecurity, the 'coming anarchy' of Robert Kaplan? There is nothing in this study to support such a claim. Youth bulges are, on the contrary, negatively related, although statistically insignificant, to armed conflict for the post-Cold War period, while positive and clearly significant for previous decades. This finding is more supportive of Jack Goldstone's claim that youth bulges are historically associated with conflict than of proponents of a new security paradigm. What is most striking about the post-Cold War model is the strong explanatory power of conventional conflict theory emphasizing factors such as level of development, regime type and geography (the latter measured by total population).

Policy Implications of Youth Bulge Findings

Population growth and a young age structure can be both a blessing and a curse. In a more optimistic perspective than the theoretical framework offered in this study, youth bulges can be regarded as an increased supply of labor that can boost an economy. This could further be expected to reduce conflict propensity. I do not dismiss this possibility, but structural aspects of the economy will probably determine the magnitude of this indirect effect. While the youth bulge hypothesis in general is supported by empirical evidence, the ways that youth bulges influence conflict propensity still remain largely unexplored empirically. However, the study provides evidence that the combination of youth bulges and poor economic performance can be explosive. This is bad news for regions that currently exhibit both features to a large extent, often in coexistence with intermediary and unstable political regimes, in particular Sub-Saharan Africa and the Arab world. A number of countries susceptible to conflict according to these three criteria are listed in Table 6.

[16] The Polity project does not assign regime scores to countries during interruption, interregnum, or transition periods, and missing values thus appear for a number of recently democratized countries.

Table 6: Vulnerable States, 2000

Vulnerable States	Youth Bulges[a]	Polity Score[b]	Annual GDPpc Growth 1990-2000[c]	GNP Per Capita Growth 1998-1999[d]
Zambia	42.1	1	-2.1	0.4
Kenya	39.8	1	-0.5	0.1
Côte d'Ivoire	37.9	-6	0.4	1.1
Burkina Faso	37.8	0	2.4	2.7
Syrian A. Rep.	37.5	-9	2.8	-3.9
Zimbabwe	37.4	-5	0.4	-1.8
Tanzania	37.1	1	0.1	3.1
Yemen	36.8	0	2.3	-3.9
Niger	36.7	-6	-1.0	-1.1
Togo	36.1	-2	-0.4	-0.3
Guinea	36.0	1	0.7	0.9
Iran	35.6	-6	1.9	0.5
Honduras	35.3	7	0.4	-3.9
Jordan	35.0	-3	1.0	-2.0
Some Major States for Comparison				
China	20.7	-7	9.2	6.3
India	28.2	8	4.1	4.9
Indonesia	28.5	-5	2.5	0.3
Russia	19.0	4	-4.6	1.6
United Kingdom	15.1	10	2.2	1.6
United States	17.1	10	2.2	3.1

[a] Defined as the percentage of 15-24 year olds over the total adult population of 15 years and above. Source: UN (1999).
[b] The Polity scale goes from –10 (autocratic) to 10 (democratic). Values close to 0 indicate intermediary regimes. Scores are of 31.12.2000. Source: Marshall & Jaggers (2000).
[c] UNDP, 2002. *Human Development Report 2002.* New York: Oxford University Press.
[d] World Bank, 2001. *World Development Report 2000/2001*. New York: Oxford University Press.

Countries that currently are assumed to be under a particular risk of experiencing armed conflict, due to accumulation of the risk factors of youth bulges, intermediary political regimes and negative or stagnant economic growth, are Zambia, Kenya, Zimbabwe, Yemen, Niger, Togo, Iran and Jordan. In addition, Côte d'Ivoire, Burkina Faso, Tanzania and Guinea will experience a considerable rise in risk if they do not manage to maintain the strong economic growth experienced at the end of the 1990s. Syria and Honduras experience both youth bulges and economic hardship, but are less prone to conflict as a result of their political regimes. Table 6 suggests a number of states that have an elevated risk of conflict in the near future, based on the presence of risk factors in 2000. In addition, a number of states that already experienced conflict in 2000 are excluded from the list. Liberia, Uganda, Rwanda, Gaza, Burundi, DR Congo, Angola, Ethiopia, Senegal and Algeria all experienced armed conflict, youth bulges, intermediary regimes and in many cases economic stagnation or recession in 2000.

The recently published Arab Human Development Report (UNDP, 2002) voices concern over the widespread economic stagnation in the Arab world, and the consequences for the large youth groups. In addition to the Arab states listed above, Saudi Arabia, Oman, and Kuwait all currently experience youth bulges to a considerable extent, although smaller than the countries listed above. While these three countries also experience economic decline, autocratic governance acts to reduce the risk of conflict. Thus, paradoxically, a partial and gradual process toward democracy may substantially increase the risk of conflict in the Arab world.

A factor that is of great importance for determining the conflict potential of youth bulges is the opportunity for migration. Migration works as a safety valve, and Moller believes that the possibility for Europe's large youth cohorts in the 19th century to emigrate to the US is an important explanation for the absence of youth-generated violence in Europe in this period (1968: 242). Developing countries that

today export a substantial part of their excess youth to more developed countries would otherwise risk a rise in youth discontent. In a recent survey, almost half of all Arab youth expressed a desire to emigrate resulting from concerns over job opportunities and education (UNDP, 2002). If migration opportunities are substantially restricted this is likely to cause an increased pressure from youth bulges accompanied by a higher risk of political disturbance and violence in a number of developing countries.

Annex 1: Descriptive Statistics

Variables	*N*	*Mean*	*St.d.*	*Min*	*Max*
Armed Conflict Onset	9,183	0.02	0.15	0	1
Youth Bulge Variables					
Youth Bulges	8,723	29.80	6.29	9.6	45
Youth Bulges, Squared	8,723	927.39	347.36	92.16	2025
Youth Bulges x Negative Economic Growth	8,723	0.05	0.22	0	1
Youth Bulges x Autocracy	8,723	0.17	0.38	0	1
Control Variables					
Total Population (LN)	9,183	8.01	2.20	1.79	14.06
Dependency	9,183	0.23	0.42	0	1
Infant Mortality Rate	8,797	79.61	58.53	2	264
Regime Type	9,183	-0.25	6.39	-10	10
Regime Type, Squared	9,183	40.90	37.63	0	100
Missing Regime Data	9,183	0.31	0.46	0	1
Economic Opportunities	9,183	2.03	3.58	-28.61	44.50
Missing Economic Data	9,183	0.24	0.42	0	1
Communist State Dissolution	9,183	0.01	0.10	0	1
Previous Conflict	9,183	0.43	0.90	0	7
Brevity of Peace	9,183	0.15	0.33	0	1

Annex 2: Correlation Matrix for Explanatory Variables, Pearson's *r*, 1950-2000

	Youth Bulges	Youth Blg,Sq	Youth Blg x EcOpp	Youth Blg x Aut.	Total Pop.	Dep. Status	IMR	Regime	Regime Sq	Missing Regime Data	Economic Opportunities	Missing Economic Data	Comm. State Diss.	Prev. Conflict
Youth Bulges, Sq	0.99													
Youth Blg x EcOpp	0.24	0.27												
Youth Blg x Autocracy	0.50	0.56	0.42											
Total Population	-0.11	-0.11	0.05	-0.04										
Dependency Status	0.07	0.06	-0.10	-0.03	-0.56									
IMR	0.52	0.50	0.04	0.12	-0.02	0.17								
Regime	-0.40	-0.38	-0.09	-0.24	0.02	0.01	-0.40							
Regime, Sq	-0.37	-0.35	-0.03	-0.16	0.45	-0.56	-0.26	0.19						
Missing Reg. Data	0.14	0.13	-0.06	0.05	-0.66	0.78	0.10	0.03	-0.73					
Economic Opportun.	-0.05	-0.05	-0.30	-0.04	0.00	0.05	-0.04	0.05	0.02	0.02				
Missing Ec. Data	0.09	0.07	-0.12	-0.03	-0.40	0.61	0.24	-0.04	-0.40	0.51	0.00			
Communist State Diss.	-0.13	-0.13	-0.02	-0.05	0.04	-0.06	-0.10	0.03	0.00	-0.06	-0.19	0.04		
Previous Conflict	0.19	0.19	0.12	0.13	0.35	-0.22	0.00	-0.12	0.03	-0.20	-0.06	-0.18	-0.01	
Brevity of Peace	0.22	0.22	0.10	0.11	0.27	-0.10	0.17	-0.05	-0.07	-0.05	-0.13	-0.08	0.04	0.39

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ENVIRONMENTALLY AND SOCIALLY SUSTAINABLE DEVELOPMENT
The World Bank
1818 H Street, NW
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Fax: 202-522-3247
E-mail: socialdev@worldbank.org
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