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«NON-VIOLENT, BUT STILL DANGEROUS»: TESTING THE LINK BETWEEN YOUTH BULGES AND THE INTENSITY OF NON-VIOLENT PROTESTS

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«NON-VIOLENT, BUT STILL DANGEROUS»: TESTING THE LINK BETWEEN YOUTH BULGES AND THE INTENSITY OF NON-VIOLENT PROTESTS[3]

Previous studies have found that the increase in the proportion of youth in adult population can lead to an increased risk of political violence. However, studies of the influence of the 'youth bulges' on the intensity of non-violent protest activity have hardly been conducted. We hypothesize that 'youth bulges' could influence the rise of non-violent protests as well. We find that though in the absence of controls, there is a statistically significant negative correlation between the proportion of young people in the total adult population and the intensity of non-violent protests this correlation turns out to be positive after the introduction of controls for per capita GDP, urbanization, non-autocratic political regime and the proliferation of education.

JEL Classification: Z

Keywords: Non-violent protests, political demography, 'youth bulges', modernization, political instability.

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INTRODUCTION

In this research we would like to focus on a well-known important political demographic factor, namely the proportion of young people in the total population of the country. The change in the proportion of young people in the total population of the country has always aroused the interest of political demographers, which is not surprising, because such population changes can cause various destabilizing events. Speaking about the historical perspective, Fuller indicates that such global socio-political events as the rise of the Nazi movement in Germany in the 1920s and 1930s, the rise of communist movements during the Cold War in 1947–1991, European colonialism, as well as the English Civil War in 1640–1660 and the Great French Revolution of 1789–1799 could have been provoked by the so-called 'youth bulges' – an increase in the proportion of young people in adult population (Fuller 2004; see also e.g. Heinsohn 2003; Goldstone 1991, 2002). Moller and Mesquida also report that young people have played a significant role in many revolutionary and protest events in the past (Moller 1968; Mesquida 1996).

The vast majority of scholars of political demography focuse on violent types of socio-political destabilization: civil wars, riots, terrorist attacks, etc. (Goldstone 1991; Urdal 2004, 2006, 2008; Weber 2019). However, studies of the influence of the 'youth bulges' on the intensity of non-violent protest activity have hardly been conducted. Since previous research has shown strong empirical evidence that 'youth bulges' could influence violent types of socio-political destabilization, we hypothesize that 'youth bulges' could have influence on non-violent protests as well. The present study aims to identify the relationship between 'youth bulges' and the intensity of non-violent protests. We believe that the results of this study will lead to important insights about the presence (or absence) of the influence of 'youth bulges' on non-violent protests and the direction of this influence.

The paper is organized as follows: in Section 1 (Literature Review) we critically analyze the existing literature on the relationship between 'youth bulges' and socio-political destabilization. Additionally, we discuss the relationship between economic modernization, 'youth bulges' and protest activities; Section 2 (Methods) consists of the model specification, operationalization and conceptualization of dependent and independent variables, description of variables and databases used. Section 3 (Results) presents the obtained results of regression analysis on the relationship between 'youth bulges' as well as the results of testing so-called 'Huntington's hypothesis'. The last Section 4 (Conclusion) summarize all findings reported in this work.

SECTION 1: LITERATURE REVIEW

In the study of 'youth bulges' many authors focus on cases of particular countries or certain historical events. For example, Korotayev and his co-authors report that 'youth bulges', triggered by the growth of the total population in the Middle East due to the economic growth in these countries in the second half of the 20th century, could have been a significant factor of the fall of authoritarian regimes in Tunisia and Egypt, later called the Arab Spring (Korotayev and Zinkina, 2011; Korotayev and Khodunov 2012). The results obtained by Korotayev are widely supported by other findings. LaGraffe claims that the emergence of the 'youth bulges' in Egypt was one of the reasons of the beginning of the Arab Spring (LaGraffe 2012). Arguments in favor of the destabilizing potential of 'youth bulges' in Europe are contained in the work of Goldstone, who reports that factors such as increase in youth population are usually accompanied by events of socio-political destabilization (Goldstone 1991). According to him, 'youth bulges' in the communist countries of Central Asia, as well as an increase in the number of young people with technical education, could have be one of the factors behind the decline of the Soviet Union (along with the lack of significant economic growth in 1970–1990 and increase in the proportion of the urban population) (Goldstone 2002). Braungart reports that an increase in the number of young people in Sri Lanka in 1971 was accompanied by an increase in political violence (many young people had education but could not find work) (Braunghart 1984). Khodunov shows that one of the most important factors in the growth of socio-political instability in Iranian Kurdistan in the 1970s was a significant 'youth bulge' (the proportion of young people in this period was estimated at about 33.1% of the total population according to the results of the 1976 census), as well as economic difficulties in the region (Khodunov 2014). In his study on political violence in India Urdal reports that the risk of armed conflict is especially high when 'youth bulges' are combined with a large excess of men, while violent riots are more likely in states where 'youth bulges' coincide with higher levels of economic inequality in cities (Urdal 2008). Farzanegan and Witthuhn draw attention to mediation effect between 'youth bulges' and political corruption (Farzanegan and Witthuhn 2017). According to their findings, political corruption produces an especially strong destabilizing effect when accompanied by a high proportion of young people in total adult population.

The 'youth bulges' are less violent in non-consolidated democracies and full autocracies (Urdal 2004). Lia reports that there is a link between the 'youth bulges' and the growth of terrorist activity in the country. He notes that for the emergence of socio-political destabilization, the 'youth bulges' must be accompanied by socio-economic problems (Lia 2007). Commenting on the issue of radical Islamic terrorism, Huntington claims that Islam itself is no more violent religion than other

religions. However, the very high birth rates in Islamic countries, which fell on the 1960s and 1970s, led to the emergence of 'youth bulges' in these countries at the end of the century, which caused the spread of youth terrorist activity on religious grounds (Huntington 1996). The positive correlation between 'youth bulges' and political violence (riots, terrorism attacks, civil wars etc.) have been found in many other studies (Goldstone 1991; Huntington 1996; Goldstone 2002; Urdal 2004, 2006, 2008; Urdal and Hoelscher 2012; Yair and Midownik 2016; Flückiger and Ludwig 2018; Yair and Miodownik 2018; Weber 2019). The number of studies where this correlation has been found to be insignificant is much smaller (Fearon and Laitin 2004; Collier and Hoeffler 2004).

In the context of our research, it is important to explain the reason why young people are more inclined to protest activity. Goldstone gives the following explanation: "Large youth cohorts are prone to new ideas and unorthodox religions, challenging the old forms of power. In addition, young people have less responsibility regarding family and career, so they mobilize easily enough to participate in social and political conflicts" (Goldstone 2002, p. 10–11). Urdal gives a similar interpretation of the inclination of young people to activism in times of presence of adverse economic and political factors. He explains the propensity of young people to terrorist and protest activities by the fact that at times when the government cannot handle the needs of young people, young people are prone to political action because of low opportunity costs (Urdal 2006). A somewhat different interpretation of the increased inclination of young people to political action is given by such authors as Goldstein, as well as Hudson and Den Boer, who pay attention to the fact that young men are mainly involved in protest activity. They see the reason for this in the high hormonal level of young men, which predisposes to activism (Goldstein 2004; Hudson and Den Boer 2004).

'Youth bulges', protest activity and economic modernization

To explain why 'youth bulges' arise and how they affect socio-political destabilization, some researchers resort to the explanatory model of "a trap at the escape from Malthusian trap", the mechanism of which can be briefly described as follows:

1) The beginning of a sustainable escape from the Malthusian trap (e.g., Korotayev and Zinkina, 2015), which by definition means per capita GDP growth, usually means a decrease in mortality, and hence a sharp acceleration of population growth (which in itself can lead to a certain increase in socio-political tensions).

2) The beginning of a sustainable escape from the Malthusian trap is accompanied by a particularly strong decrease in infant and child mortality. All these factors lead to a sharp increase

in the proportion of young people in the total population in general and in the adult population in particular (the so-called ‘youth bulge’).

3) As a result, there is a sharp increase in the proportion of population that is most prone to violence, aggression and radicalism, which in itself is a powerful factor of political destabilization.

4) The rapid growth of the total number of youth requires a dramatic increase in the number of new jobs, which is always a very difficult task. A surge in youth unemployment can have a particularly powerful politically destabilizing effect, creating an army of potential participants (“combustible material”) for all sorts of political (including revolutionary) upheavals.

5) Escape from the Malthusian trap stimulates strong urban growth. In addition, the displacement of the surplus population from the village is further intensified by the rapid growth of agricultural labor productivity. Massive migration from village to city almost inevitably gives rise to a noticeable number of people dissatisfied with their situation, since migrants from the village at first after relocation can only rely on the most low-skilled low-paid work and extremely mediocre (and often just plainly unsatisfactory) housing conditions.

6) The escape from the Malthusian trap is ultimately achieved primarily through the development of new sectors of economy, through restructuring the old ones, which cannot take place completely without difficulties for workers. In all cases, the old traditional qualification of workers loses meaning, and, not having a new modern qualification, these workers are forced to get employed low-skilled jobs (if they manage to find it at all), which, of course, can generate mass discontent and serve as a serious factor of political destabilization.

7) First of all, it is young people who migrate to the cities from the rural areas. Thus, the ‘youth bulge’ factor and the factor of intensive urbanization act together, producing a very powerful destabilizing effect. The number of the young people, the most radically minded part of the urban population, is growing particularly fast, while such young people are concentrated in the largest cities / political centers.

8) This situation can lead to the most serious political destruction, even in the conditions of a fairly stable economic growth. Political upheavals occur with a particularly high probability if government loses credibility as a result of a military defeat or in conditions of a protracted economic crisis that replaced the economic recovery (however, the events of the Arab spring showed once again that even this is not necessary) (Korotaev et al., 2011; Korotayev, Malkov, & Grinin, 2014).

It can be seen that there are many studies that link the emergence of ‘youth bulges’ with increased risks of socio-political destabilization, such as terrorism, protest activity, civil wars, armed conflicts, political repressions etc. Scholars seem to pay less attention to non-violent protest.

To the best of our knowledge, so far almost only the work of Ang, Dinar and Lucas (2014) studies the relationship between 'youth bulges' and the intensity of non-violent protest activity. However, these authors fail to identify statistical link between youth population and protest activity reporting only the relationship between non-violent protests and interaction term between 'youth bulges' and ICT (the penetration of information and communication technology) (Ang, Dinar, and Lucas 2014).

Nevertheless, the conclusions of previous works suggest the existence of such a connection. Since young people (and young men in particular) are more inclined to participate in violent protests, it is possible to expect that they may also be inclined to participate in non-violent antigovernment demonstrations.

Against this background it is highly symptomatic that a straightforward test of the correlation between the proportion of young people aged 15–29 years old in the total adult population and the intensity of non-violent protests reveals rather strong significant *negative* correlation – that is, at the face of it the younger people we find in the adult population the less non-violent protests we should expect (see Fig. 1):

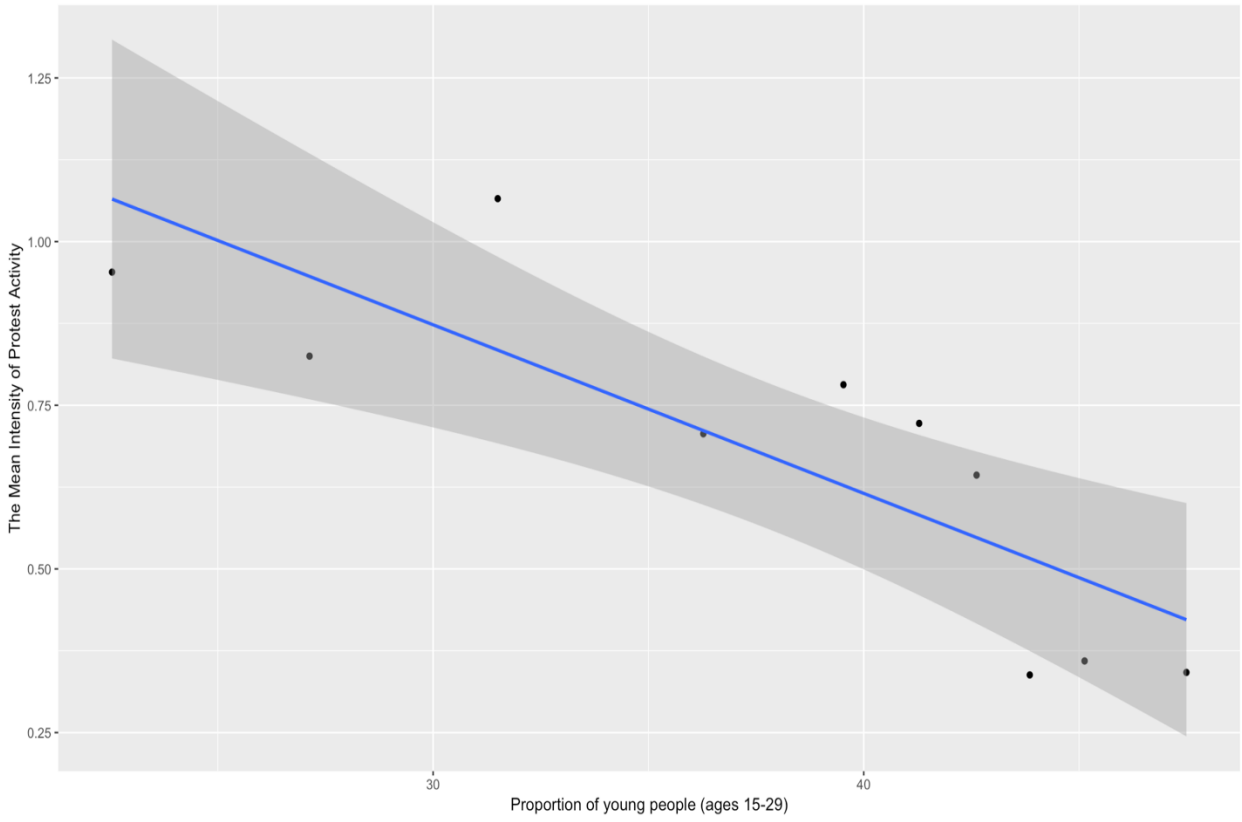

Fig. 1. Correlation between proportion (%) of young people, ages 15-29 (% of the total 15+ population) and the mean intensity of protest activity[5] (per decile analysis), 1950-2014.

Note: r=0.83, p=0.003[6], R^2=0.684

[5] Measured as a number of antigovernment demonstrations recorded per country per year.

Indeed, it is evident that in Fig. 1 we deal with a strong negative per decile correlation between the number of non-violent demonstrations and share of the youth (ages 15-29) in the total adult population (15+). In the three deciles with the lowest share of the youth in total adult (15+) population (less than 34%) the average intensity of protests is about one antigovernment demonstration per year per country, whereas in three deciles with the highest value of this indicator (more than 42%) it is about one demonstration every three years. For the deciles with the intermediate intensity of 'youth bulges' we observe intermediate levels of the antigovernment protests intensity.

However, there is a reason to believe that this correlation should not be interpreted as the indicator of negative influence of 'youth bulges' on the protest activity. As will be shown below this correlation is in fact explained by the dynamics of both share of the youth and the protest activity with modernization, whereas after modernization factors are controlled for, the influence of the share of youth on protest intensity turns out to be positive. There are grounds to expect that the negative correlation between the share of young adults in the total adult population and the intensity of non-violent antigovernment protests may be regarded as the result of an interplay a number of fundamental factors.

A very important point is that the economic modernization is negatively correlated with the share of young people in the total adult population (see Fig.2):

[6] Note that the bivariate negative binomial regression of the share of youth in the adult population on the intensity of non-violent protests also indicates a significant negative correlation (see Table 1 and Table 2).

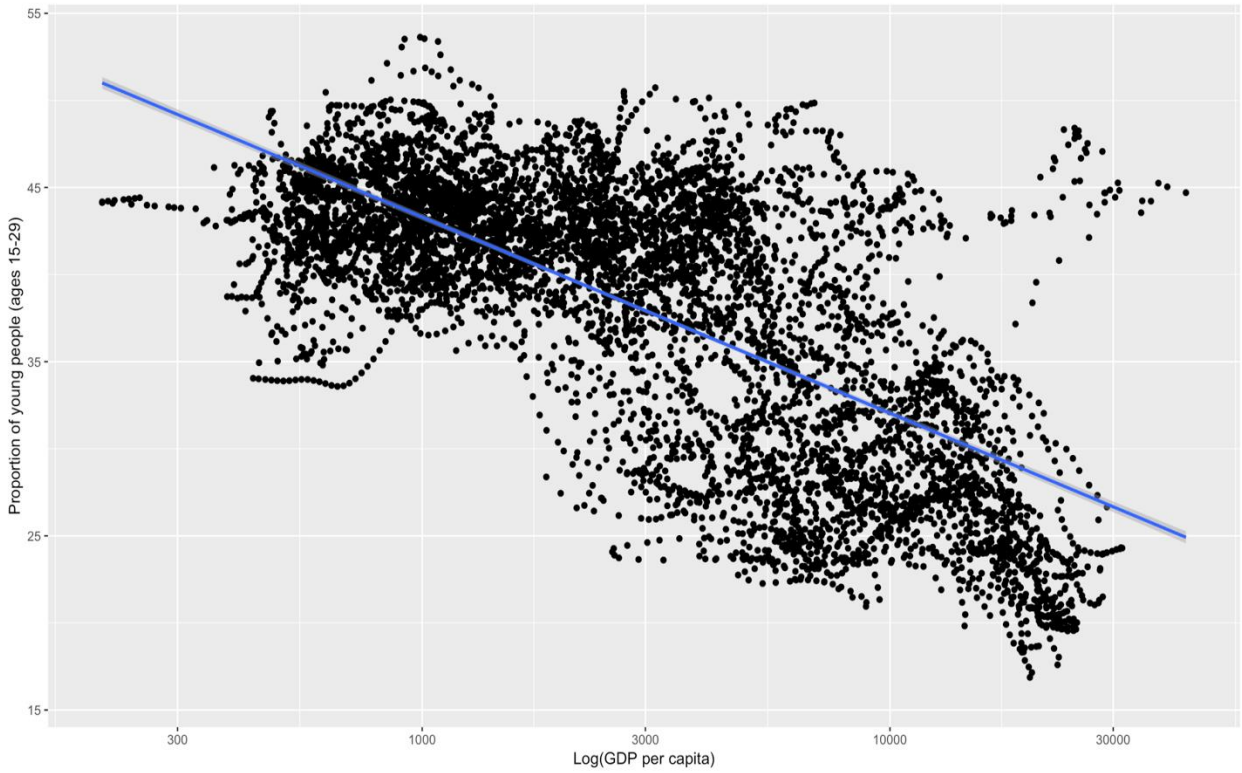

Fig. 2. Correlation between GDP per capita, PPP[7](logarithmic scale) and proportion of young people (15–29 years old) in total adult population, 1950–2008.

Note that the negative correlation between GDP per capita and the proportion of young people in the total adult population is accounted for by the so-called "demographic transition" mechanism. The demographic transition is transition from the traditional regime of population reproduction characterized by high fertility and high mortality to the modern regime characterized by low fertility and low mortality (Chesnais 1992; Caldwell 2006; Gould 2015). Researchers usually identify two main phases of demographic transition[8]. The pronounced economic and social modernization of western countries which began in the late eighteenth century led to increasing life expectancy accompanied by substantial decrease of infant and child mortality rates, which resulted in the growth of 'youth bulges' that contributed to the 19th century European revolutions (Caldwell 2006; Dyson 2013; Reher 2011; Livi-Bacci 2012; Gould 2015). Commenting on Europe's demographic development, Schofield and Reher argue that increased living standards, better nutrition levels of population as well as the spread of the work of physicians and other healthcare specialists led Europe against the background of still very high fertility levels led to the remarkable growth of the population of the West (Schofield and Reher 1991; see also Chesnais 1992; Livi-Bacci 2012). Around 1870-1920 the vast majority of Western European countries moved to the next

[7] Here and throughout we utilize Maddison (2010) database.

[8] Note that the phase of falling dependency ration (proportion of children under 14 and old people above 65+) is associated with the second phase of demographic transition (see Eastwood and Lipton 2012).

phase of demographic transition. During this phase fertility rate decreased significantly, which resulted in the onset of the population aging increase in median ages and (with a certain lag) the decrease of the proportion of the youth in the total adult population. The same logic is applicable to the most of developing countries after the Second World War. After the Second World War the global introduction of modern medical technologies (especially, antibiotics) led to a very pronounced decrease of mortality throughout all the developing countries, most of which, thus, went through the first phase of demographic transition rather fast till the 1960s, which led to a significant increase of the share of the youth in the adult population (Preston 1979; Dyson 2013; Reher 2011; Livi-Bacci 2012; Gould 2015). Since, the 1960s developing countries started entering the second phase of demographic transition. As has been mentioned above further modernization of social systems leads to the decline in fertility - for example, through urbanization or through the proliferation of formal education, especially among females, because educated women tend to control their fertility much stronger than uneducated ones. Like earlier in Europe in most developing countries this resulted in the recent decades in the onset of the population aging increase in median ages and (with a certain lag) the decrease of the proportion of the youth in the total adult population.

Against this background, it is noteworthy that the intensity of non-violent protests is positively correlated with economic modernization (see Fig. 3):

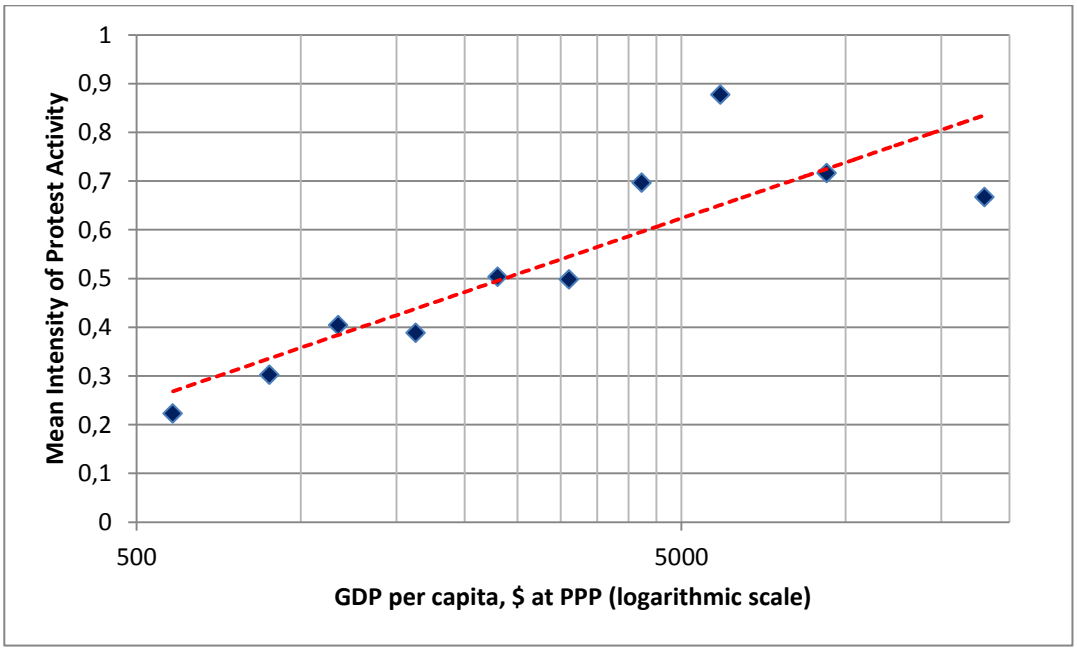

Figure 3. Per decile correlation between GDP per capita (PPP[9], log) and the intensity of non-violent protest activity, 1950–2008. Note: r=0.863, p=0.001, R^2=0.745.

[9] In 1990 International Geary-Khamis dollars.

To explain the positive correlation between economic modernization and the intensity of anti-government demonstrations one should take into account a number of factors. One of them is democratization.

To start with, the process of economic modernization tends to be accompanied by the growth of the proportion of democracies. In its turn, this is accounted for by some researchers by the point that the growth of per capita GDP in authoritarian regimes leads to an intensification of the struggle for democracy, and hence to an increase in the number of antigovernment demonstrations (Lipset 1959; Moore 1993; Epstein et al. 2006; Korotaev, Bilyuga, and Shishkina 2018). Przeworski and Limongi suggest another explanation why among more economically developed countries we find significantly more democratic regimes. They maintain that the probability of emergence of a democratic regime more or less similar for different levels of economic development, but in more economically developed countries the probability of survival of democracy is higher (Przeworski and Limongi 1997). In fact, we believe that both explanations are not mutually exclusive, providing quite together quite appropriate explanation why is significantly higher proportion of economically developed countries have democratic regimes in comparison with economically underdeveloped states.

What is especially relevant for us is that the proportion of democratic states among the countries with higher income levels tends to be significantly higher than in lower income countries (see, e.g., Korotayev, Bilyuga, and Shishkina 2018, p.13, fig.6). In other words, more developed countries tend to be much less authoritarian, which increases the number of peaceful demonstrations, whereas full autocracies are almost by definition rather strong inhibitors of peaceful antigovernment protests (see, e.g., Slinko et al. 2017; Korotayev, Bilyuga and Shishkina 2018) and decrease of their number among more economically developed countries is bound to be associated with the increase in the intensity of antigovernment protests.

Another important result of modernization is the explosive growth of urbanization, which could be measured as the proportion of urban population in the total population. Against this background, it is important to note that ‘youth bulges’ are higher in countries with lesser levels of urbanization (see Fig. 4):

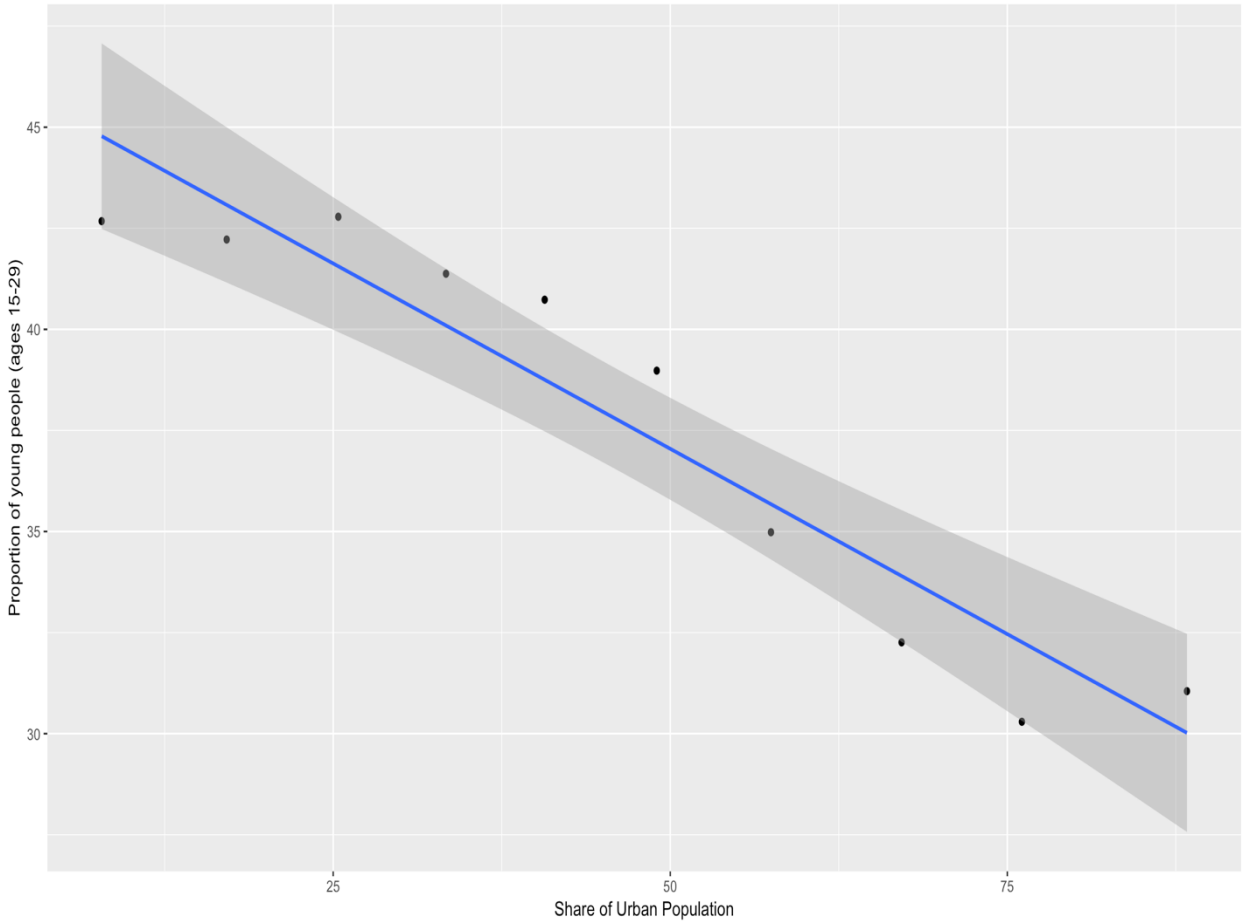

Fig. 4. Per decile correlation between the share of urban population (%) and the proportion (%) of young people (ages 15 to 29) in total adult population, 1950–2014.

As we see, in countries with the lowest levels of urbanization (less than ~30%) 'youth bulges' are the most pronounced, with the average share of youth (ages 15-29) in the total adult population around 42-43%. This share slightly decreases with the growth of urbanization till around 50% (the average share of youth in the countries where approximately a half of a population live in cities is around 39%). A substantial decline of the share of the youth (from 39% to 32%) is observed with the growth of urbanization from 50% to 70% of urban population. On the other hand, among the countries with the highest levels of urbanization (more than ~70%) the «youth bulges» are the least pronounced, with the average share of youth around 30-31%.

Against this background, it appears appropriate to note that some previous studies have indicated that urbanization factors could be significant predictors of socio-political instability, though the number of such studies is surprisingly rather limited. Urdal and Hoelscher report that urban population and economic decline may trigger both non-violent and violent social disorder events (Urdal and Hoelscher 2012). Gleditsch and Rivera in their research on the diffusion of non-violent campaigns point out that «non-violent direct action appears to be much more common in

cities, and efforts to undermine governments through noncooperation tend to be more effective when they have a presence in key cities and urban areas than in the periphery. Furthermore, urban populations tend to have more individual resources, and a higher density of networks among individuals makes it easier to organize» (Gledistch and Rivera 2017, p.131). Besides, their regression model indicates that the variable reflecting the proportion of people living in cities is a statistically significant predictor of non-violent campaign onsets. As was shown above the diffusion of urbanization correlates negatively with the share of youth – thus, against the background of the positive correlation between the urbanization level and protest intensity, we may deal here with a possible mechanism accounting for the negative correlation between the share of youth and non-violent protests.

Other important outcome of economic modernization process is the diffusion of education. The relationship between economic development and the diffusion of education can be partly accounted for by the point that there is a strong positive correlation between education level and economic growth at the early phases of modernization. On the other hand, growth of GDP per capita allows social systems to increase spending on education, which promotes its quantitative expansion; herewith the issue of education quality becomes more important at the later phases of modernization transition. In turn, some studies suggest that the level of education of the population closely correlate with the intensity of anti-government demonstrations – non-violent demonstrations are more popular form of protest among educated people (Hall, Rodghier, and Useem 1996; Jenkins and Wallace 1996; Korotayev, Bilyuga, and Shishkina, 2018; for a general positive correlation between the diffusion of education and socio-political destabilization see e.g. Huntington 1968; Goldstone 1991; Goldstone 2002; Lia 2007; Campante and Chor 2012; Brockhoff, Krieger, and Meierrieks 2015; Weber 2019).

Since, in countries with lower levels of fertility rates we may observe higher levels of the education diffusion and economic development (Lutz and Qiang 2002), it is not surprising that in countries with higher ‘youth bulges’ we may observe lower levels of education. The following scatterplot describes the relationship between ‘youth bulges’ and the level of education measured as tertiary education enrollment (see Fig. 5):

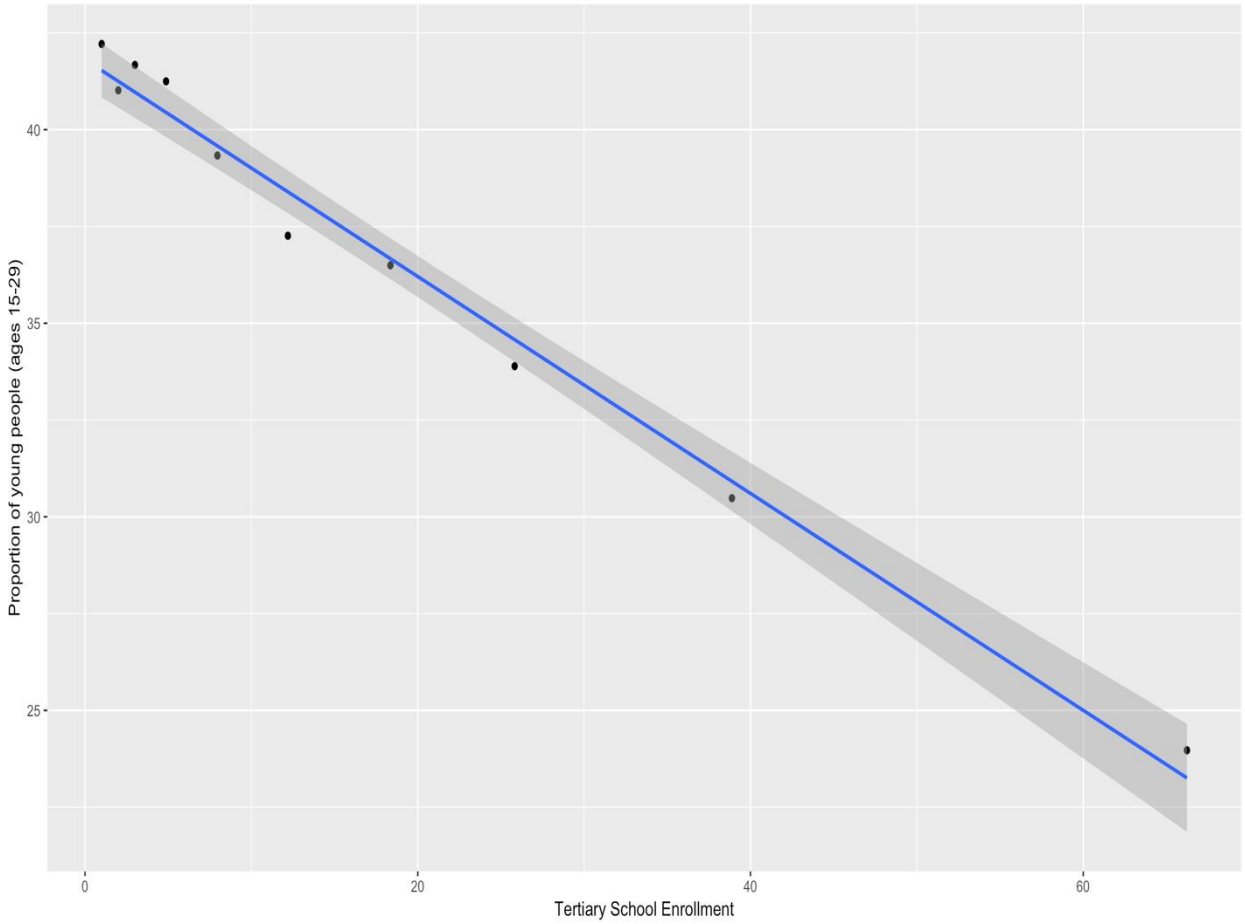

Fig. 5. Per decile correlation between tertiary school enrollment (% of the tertiary school-aged population) and the proportion (%) of young people (ages 15 to 29), 1950–2013.

As we see, in the countries of the first four deciles with a very high (more than 41%) share of youth in the total adult population the average tertiary school enrollment does not exceed 5%, whereas in the decile with the lowest average share of youth (~24%) the average tertiary school enrollment exceeds 66%. Thus, for the decile of countries with the lowest share of youth the tertiary school enrollment turns out to be more than 66 times as high as among the decile with the highest share of youth. In the range 41 to 23 per cent of the share of youth we observe a rather pronounced increase in the tertiary school enrollment. Thus, in countries with the bigger proportion of young population in total adult population we tend to find lesser levels of tertiary education enrollment (the same is true for such indicators as mean years of schooling and proliferation of literacy – see, e.g., United Nations Development Program 2015). As was shown above the diffusion of education correlates positively with non-violent protest intensity – thus, we deal with one more possible mechanism accounting for the negative correlation between the share of youth and the protest intensity.

Apparently, it is precisely economic modernization and sociopolitical phenomena (democratization, spread of literacy and urbanization, reduced fertility, etc.) produced by

modernization, that may account for the negative correlation between 'youth bulges' and antigovernment demonstration intensity on a global sample of countries, which we observe in Fig. 1. However, if we examine the connection between the level of non-violent demonstrations and 'youth bulges' at certain levels of modernization and taking into account different political regimes, then we can observe a positive correlation between the two variables.

Indeed, consider the relationship between 'youth bulges' and non-violent demonstrations in the most economically developed countries[10] with a democratic political[11] regime (see Fig. 6):

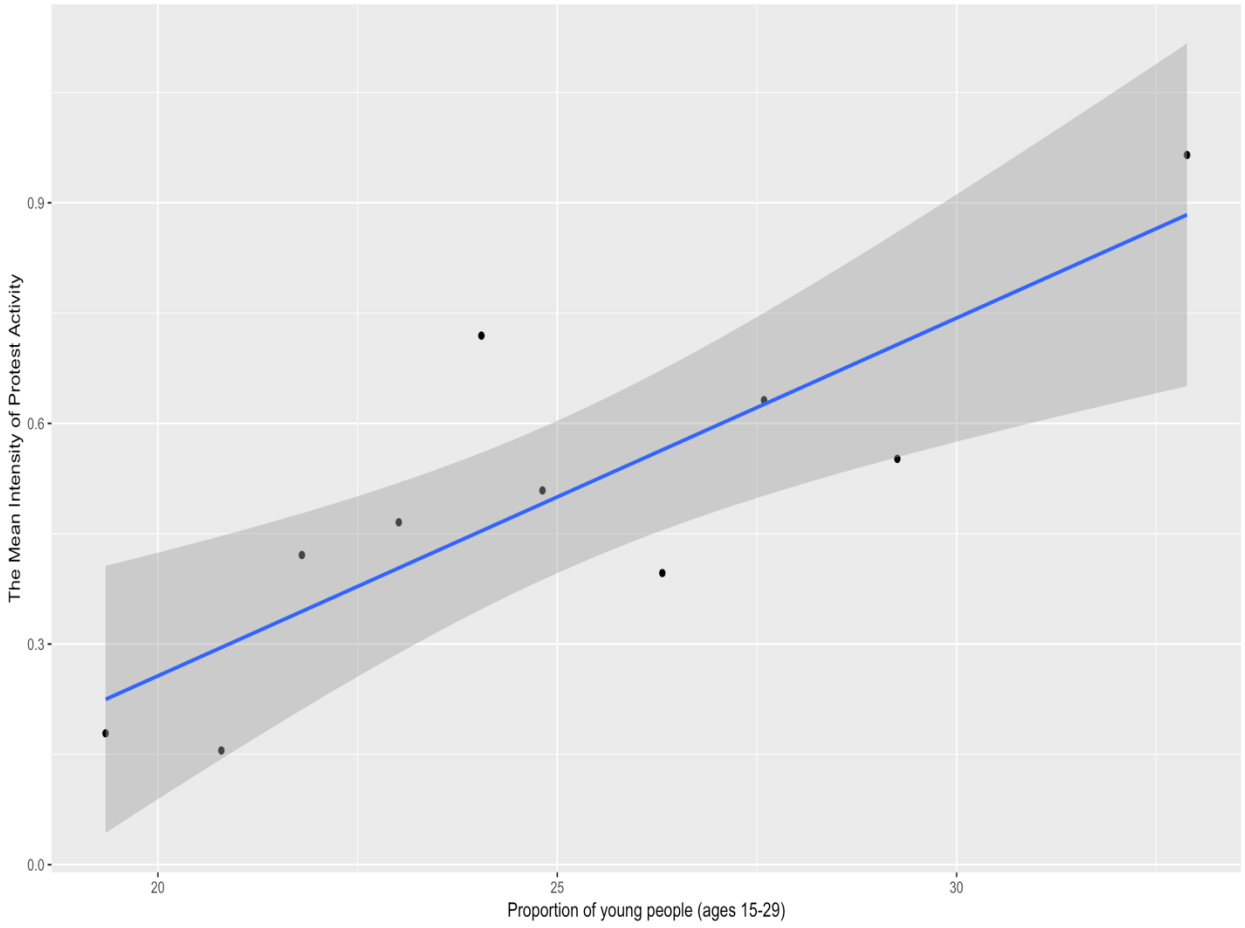

Fig. 6. Per decile correlation between the proportion (%) of young people (ages 15-29) in total adult population and the mean intensity of protest activity in the most economically developed countries with democratic political regimes, 1950–2014.

[10] This sample includes countries whose GDP per capita (PPP) corresponds to the last decile (more than 13 thousand dollars per capita on the Maddison scale).

[11] This sample includes countries that are defined as "full democracies" according to the J. Goldstone et al. methodology (for more detail see Goldstone et al. 2010).

As it suggested by Figure 6, in the most economically developed and democratic countries, there is a positive correlation between the level of protest activity and the 'youth bulges', which is just contrary to the general pattern found in Fig. 1.

An example of the least economically developed countries[12] with consolidated and non-consolidated authoritarian regimes,[13] can be found in Fig.7:

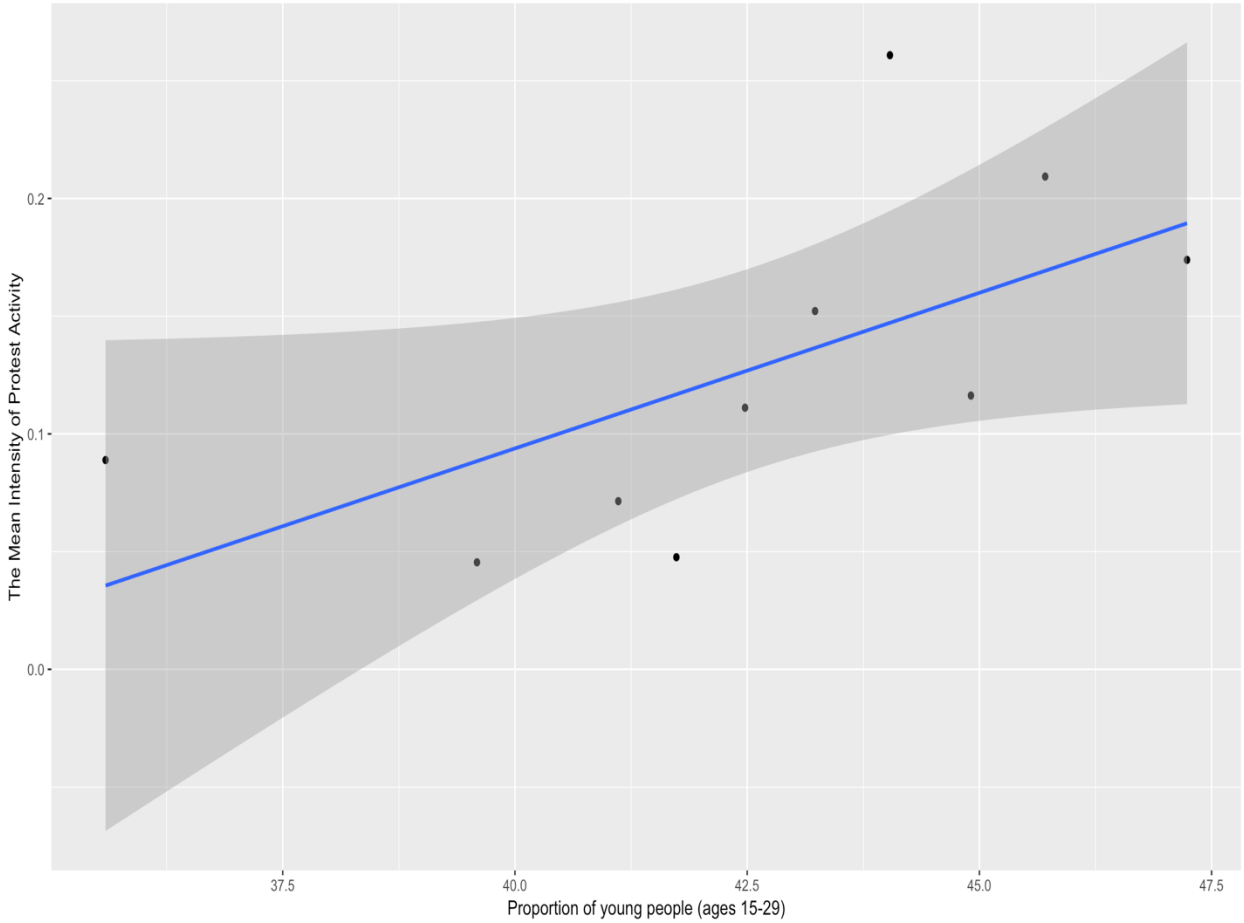

Fig. 7. Per decile correlation between the proportion (%) of young people (ages 15-29) in total adult population and the mean intensity of antigovernment demonstrations in the least economically developed countries with authoritarian regimes, 1950–2014.

It can be seen that at this level of sociopolitical and economic modernization we are also more likely to deal with a positive correlation between 'youth bulges' and anti-government demonstrations.

[12] This sample includes countries whose GDP per capita (PPP) corresponds to the first decile (less than $ 684 per capita on the Madison scale).

[13] This sample includes countries that are defined as "consolidated autocracies" and "unconsolidated autocracies" according to the J. Goldstone methodology (for more details see Goldstone et al. 2010).

The results presented in Figure 1, Figure 6 and Figure 7 show that the relationship between antigovernment demonstrations and ‘youth bulges’ appears to be different at different levels of socio-political and economic modernization. We can draw several conclusions, summarizing these findings. Firstly, the variables associated with economic modernization, such as the type of political regime, can have a strong influence on the relationship between ‘youth bulges’ and the intensity of antigovernment demonstrations. Therefore, this relationship should be studied only ‘in the context’ of other variables of modernization discussed above. Secondly, the link between ‘youth bulges’ and the intensity of antigovernment demonstrations may not be linear. The possible non-linearity of this link has been noticed by some scholars. For example, in his prominent work Huntington argued that when the number of young people in the *total* population of the country exceeds the level of 20%, the probability of destabilization processes increases as well (Huntington 1996). We can interpret the Huntington’s assumption that the influence of the ‘youth bulges’ may be non-linear. The "Huntington’s hypothesis" about the non-linear effect of ‘youth bulges’ on various phenomena of social and political instability has already been tested for certain types of political violence. For example, in his work on the study of the link between ‘youth bulges’ with armed conflicts, Urdal notes that the square term of ‘youth bulges’ is not a statistically significant predictor of armed conflicts (Urdal 2004). In his more recent work Urdal claims that a squared term of ‘youth bulges’ is not statistically significant predictor of armed conflicts, terrorist activity and violent protests (Urdal 2006). Testing the "Huntington’s hypothesis", Davenport and Nordas failed to identify a non-linear link between ‘youth bulges’ and intensity of political repression (Nordas and Davenport 2013). However, to the best of our knowledge, there has been no research on testing non-linear relationships between ‘youth bulges’ and non-violent antigovernment demonstrations so far. As part of this work, we intend to test the "Huntington's hypothesis" about the non-linear relationship between non-violent protests and ‘youth bulges’ and reveal if there is a special threshold, exceeding which ‘youth bulges’ have significantly stronger influence on the intensity of non-violent protests.

Utilizing theoretical assumptions about the consequences of ‘youth bulges’, we would like to test the following hypothesis:

H1: There should be a positive statistically significant link between “youth bulges’ and the intensity of non-violent antigovernment demonstrations after the introduction of all the relevant controls.

H2: Following the "Huntington's hypothesis", there should be a non-linear positive relationship between the ‘youth bulges’ and the intensity of non-violent antigovernment demonstrations.

SECTION 2: METHOD SECTION

In order to test the link between 'youth bulges' and non-violent antigovernment demonstrations, we obtain the data from Cross-National Time-Series (CNTS) Database (Banks, Wilson, 2019), which contains the variable that reflects non-violent protests – «Antigovernment demonstrations»:

CNTS defines its variable ***domestic8*** («Antigovernment demonstrations») *as* «any peaceful public gathering of at least 100 people for the primary purpose of displaying or voicing their opposition to government policies or authority, excluding demonstrations of a distinctly anti-foreign nature» (Wilson 2019, p. 13). This variable indicates the number of non-violent protests per year in a given country (count data type). This will be our dependent variable.

Unfortunately, there is no universal approach to operationalize 'youth bulges'. In the earliest studies on the link between 'youth bulges' and armed conflicts, conducted by Collier and Hoeffler (Collier and Hoeffler 2004) and Fearon and Laitin (Fearon and Laitin 2003), 'youth bulges' were operationalized as youth cohorts of 15-24 years divided by total population of country. Huntington and Goldstone have resorted to such operationalization of 'youth bulges' in their theoretical studies (Huntington 1996; Goldstone 2002). This approach to the operationalization of 'youth bulges' has been criticized by Urdal, arguing that such a dimension of 'youth bulges' can be problematic, because of underestimation of demographic 'bottlenecks' in countries with persistent high birth rates (Urdal 2004). Urdal himself suggests measuring 'youth bulges' as a proportion of young people 15–24 years old in the total adult population over 15 years old (Urdal 2004; Urdal 2006; Urdal 2008). Exactly the same approach to the operationalization of 'youth bulges' is utilized by Nordas and Davenport (2013) and Farzanegan and Witthuhn (2017).

Following the assumption that young men are most prone to political violence, some authors suggest measuring 'youth bulges' as a proportion of young men 15–29 years old to the entire male adult population over 15 years old. This approach is used by Yair and Midownik, who studied the link between 'youth bulges' and ethnic / non-ethnic armed conflicts (Yair and Midownik 2018). Weber has resorted to similar operationalization in his work devoted to test the link between 'youth bulges' and democratization (Weber 2013). He uses a slightly different approach to measuring 'youth bulges' than the one used by Yair and Midownik. Weber divides the number of young men 15–29 years old by the entire population over 15 years old. However, in his recent work Weber measures the 'youth bulges' as the ratio of young males aged 15 to 29 to the total male population 15 or older (Weber 2019). Somewhat similar to Weber's approach to operationalization of 'youth bulges' has been developed by Cincotta who suggests measuring 'youth bulges' as proportion of young adults (ages 15 to 29) in the working-age population (ages 15 to 64) (Cincotta 2008).

Since, there is no evidence that young females are less inclined to participate in non-violent protests than the young males we take as independent variable the share of youth (both male and female) in total adult population. Note that we test both main operationalization of youth bulges (ages 15-24/ages 15-29).

By testing the "Huntington's hypothesis", we are going to investigate the non-linearity of the link between 'youth bulges' and the intensity of protest activity. It is noteworthy that Huntington argues that instability usually occurs after the number of young people in the total population exceeds the level of 20% (Huntington 1996). To test this hypothesis, we will measure 'youth bulges' as the proportion of young people 15-24 years to total populations and recode this value into a binary variable (0 - 'youth bulges' is less than 20%, 1 - 'youth bulges' is more than 20%). To test the nonlinearity assumption, we will introduce the squared term of 'youth bulges'.

We take the data on the number of total population and youth from the United Nations Population Division (2019) database. This database contains data on the number of people living in a given country in different age cohorts for the period 1950-2015.

Many studies note that the level of economic development may affect the intensity of instability in a country. It was noticed that higher levels of economic development create conditions conducive to non-violent protests, creating a dense infrastructure for communication between potential protesters, as well as active media outlets that raise awareness of protest activity among the general public (Dalton, Van Sickle, and Weldon 2010). To control for the economic development in the country, we use the GDP per capita (PPP)[14] variable from the Maddison database (Maddison 2010). We will use this database, as it covers general population of the countries of the world from 1950 to 2010. In particular, it covers developing countries in the period 1950–1970, when the first phase of demographic transition took place in them, accompanied by a decrease in child mortality and stable level of fertility, which was the main factor of the emergence of 'youth bulges' in these countries (see Korotayev, Goldstone, and Zinkina 2015). For the robustness check purposes, we utilize data from World Bank database on GDP per capita (PPP) (2019). The GDP per capita variable is logged to normalize its distribution.

In countries with a large population more protests are likely to be observed. Therefore, we introduce additional control for the total number of population in country. We take population data from the United Nations Population Division (United Nations Population Division 2019) database. For the robustness check purposes, we also use population data from Maddison database (Maddsion 2010). The variable is logged to normalize its distribution.

[14] In 1990 International Geary-Khamis dollars.

One of the relevant important indicators that can be relatively easily estimated at the global level is the share of urban population (see Dahl et al. 2014). Non-violent direct actions seem to be much more common in cities, and efforts to undermine governments through non-cooperation tend to be more effective when they are in key cities and urban areas than on the periphery. In addition, the urban population tends to have more individual resources, and a higher density of networks among people facilitates organization (Gledistch and Rivera 2017). We include control for the level of urbanization in the country, using data from the United Nations Population Division (2019). To measure the level of urbanization, we will divide the population of cities by total population of the country. For the robustness test we divide the number of people living in cities (United Nations Population Division 2019) by total population of country using the data from Maddison database (2010).

Other important variable which has strong effect on protests is the diffusion of education. Barnes and Kaase (1979) find that better educated people are more inclined to participate in protests. To control for the diffusion of education we impose such measurement of education as percentage of the tertiary school-aged population enrolled in tertiary school. This measurement was developed by V-Dem experts utilizing data from database built by Barro and Lee (2015). Additionally, for the robustness check we measure the diffusion of education as the average years of education among citizens 15+ aged population. This measurement was developed by V-Dem experts utilizing information from Coppedge et al. (2019) database.[15]

Finally, previous studies have convincingly shown that the type of political regime has a significant impact on various types of instability, including non-violent demonstrations (see Slinko et al. 2017; Korotayev, Biluyga, and Shishkina 2018). Thus, we add additional control variable which reflect the type of political regime in a given country. We utilize data on political regime from Polity IV database (Marshall, Gurr, and Jaggers 2016). Note that Polity IV applies the scale which varies from -10 («Autocracy») to +10 («Full Democracy»). For the robustness check we apply a different operationalization of political regime suggested by Goldstone and his colleagues. We reconfigure the data from this database according to the scheme of Goldstone et al. (2010). Thus, we divide all political regimes according to the level of political competition and the principle of recruiting to power, using Polity IV database (Marshall, Gurr, and Jaggers, 2016). With this approach, there are five different political regimes: full autocracies, partial autocracies, partial democracies with factionalism, partial democracies, full democracies.

The key method of the research is negative binomial regression. Its specification allows one to avoid biases connected with the non-normal Poisson distribution of a dependent variable with a

[15] For the list of entire sources see V-Dem 9 Codebook (Coppedge et al. 2019, p.323)

large number of zeroes (whereas our dependent variable is a rather good example of a variable with a Poisson distribution and a large number of zeroes). This point does not allow us the application of the standard parametrical OLS-regression, which is based on the assumption of normal distribution of the dependent variable (see: Hilbe 2011). Since our data contain country-year observations and organized as panel data, we introduce fixed effects on countries and years.

Our database covers the time period from 1950 to 2008. However, data for some countries / time periods are missing due to the lack of data.

Robustness check strategy

For the robustness check we suggest using different approaches to operationalize 'youth bulges' to demonstrate that different measurements of 'youth bulges' do not affect the results of regression analysis. We utilize the approach proposed by Huntington and Goldstone (Huntington 1996; Goldstone 1991) to measure 'youth bulges' as the proportion of youth (or young men) (ages 15 to 24 years old) in total population. We apply this operationalization to young people aged 15-29 and 15-24 to cover other possible operationalization.

Additionally, as mentioned above, we apply different measures of control variables to estimate the validity of suggested models on different data.

SECTION 3: RESULTS

We start with the test of our first hypothesis about the existence of the link between the 'youth bulges' of 15–24 years old and 15–29 years old and the intensity of antigovernment demonstrations. Table 1 displays the results from negative binomial fixed-effect models testing the relationship between 'youth bulges' measured as the proportion of young adults (ages 15 to 24) in total adult population and the intensity of non-violent antigovernment demonstrations:

Table 1. Negative binomial fixed-effect regression: Youth bulges (ages 15-24) and the intensity of non-violent protests, 1950-2008

	Dependent variable:	
	Antigovernment demonstrations	
	(1)	(2)
Intercept	-.074	-4.456***
	(.144)	(.860)
Youth bulge (15-24)	-.045***	.042***
	(.005)	(.010)
log(GDP per capita)		-.282**
		(.093)
log(Population)		.280***
		(.035)
Political Regime		.015*
		(.006)
Urbanization		.038***
		(.004)
Education		-.007**
		(.003)
Time fixed-effects	Yes	Yes
Country fixed-effects	Yes	Yes
Observations	8,131	5,378
Akaike Inf. Crit.	12557.21	7872.905

*Note: *p<.05, **p<.01, ***p<.001*

Table 2. Negative binomial fixed-effect regression: Youth bulges (ages 15-29) and the intensity of non-violent protests, 1950-2008

	Dependent variable:	
	Antigovernment demonstrations	
	(1)	(2)
Intercept	.074	-4.770***
	(.167)	(.888)
Youth bulge (15-29)	-.036***	.036***
	(.004)	(.008)
log(GDP per capita)		-.270**
		(.094)
log(Population)		.277***
		(.035)
Political Regime		.015*
		(.006)
Urbanization		.038***
		(.004)
Education		-.007**
		(.003)
Time fixed-effects	Yes	Yes
Country fixed-effects	Yes	Yes
Observations	8,131	5,378
Akaike Inf. Crit.	12562.25	7870.987

*Note: *p<.05, **p<.01, ***p<.001*

As we see, Model 1 with 'youth bulge' as the only independent variable indicates a negative statistically significant correlation between 'youth bulges' (ages 15 to 24) and the intensity on non-violent antigovernment demonstrations. However, when we add relevant control variables which indicate different outcomes of economic and sociopolitical modernization process in Model 2 the correlation between two variables turns out to be positive. Note that the IRR values calculated for the Model 2 suggests that one percent change in 'youth bulges' (ages 15 to 24) increases the total number of non-violent protests by 4.3%.[16]

Table 2 displays the results from negative binomial fixed-effect models testing the relationship between 'youth bulges' measured as the proportion of young adults (ages 15 to 29) in total adult population and the intensity of non-violent antigovernment demonstrations (see Table 2).

Again, within the first model in Table 2 we deal with the statistically significant negative correlation between 'youth bulges' (ages 15 to 29) and the intensity of non-violent protests. When we introduce our relevant control variables into the regression equations the correlation between our two variables of interest turns out to be positive. Note that the IRR values calculated for the Model 2 in Table 2 suggests that one unite increase in 'youth bulges' (ages 15 to 29) increases the total amount of non-violent protests by 3.7%.[17]

Note that the results reported in Table 1 are quite consistent with the results reported in Table 2, which supports additionally our first hypothesis (H1) about the positive statistically significant link between 'youth bulges' covering suggested youth cohorts (ages 15-24 and ages 15-29) and the intensity on non-violent protest activity. It is important to note that the obtained results remain stable regardless of the choice of operationalization of 'youth bulges'.

«Huntington's hypothesis?»

To test this hypothesis, we will measure 'youth bulges' as the proportion of young people 15-24 years to total populations and recode this value into a binary variable (0 - 'youth bulges' is less than 20%, 1 - 'youth bulges' is more than 20%). To test the non-linear effect of 'youth bulges', we introduce the squared term of 'youth bulges'.

The results of testing 'Huntington's hypothesis' about the non-linear link between 'youth bulges' measured as the proportion of youth (ages 15-24) in total population and the intensity on non-violent protest activity are presented below (see Table 3):

[16] The Incidence Rate Ratio (IRR) value is 1.043.
[17] The Incidence Rate Ratio (IRR) value is 1.037.

Table 3. Negative binomial fixed-effect regression: Non-linear link between 'youth bulges' and the intensity of non-violent protests, 1950-2008

	Dependent variable:	
	Antigovernment demonstrations	
	(1)	(2)
Intercept	-5.686***	-2.189**
	(1.491)	(.674)
Youth bulge (Huntingtons operationalozation)	.252	
	(.144)	
Youth bulges (binary)		.092
		(.121)
log(GDP per capita)	-.290**	-.383***
	(.092)	(.090)
log(Population)	.256***	.252***
	(.034)	(.034)
Political Regime	.014*	.013*
	(.006)	(.006)
Urbanization	.036***	.038***
	(.004)	(.004)
Education	-.008**	-.009***
	(.003)	(.003)
Youth bulge (Huntingtons operationalization) (sqr.)	-.005	
	(.004)	
Time fixed-effects	Yes	Yes
Country fixed-effects	Yes	Yes
Observations	5,378	5,378
Akaike Inf. Crit.	7872.076	7890.565

*Note: *p<.05, **p<.01, ***p<.001*

Model 1 in Table 3 contains squared term of suggested by Huntington operationalization of 'youth bulges'. Note that the squared term of 'youth bulges' is insignificant, which does not support the assumption about non-linear relationship between suggested operationalization of 'youth bulges' and the intensity of protests activity.

The results presented in Table 3 suggests that there is no special 'threshold', crossing which 'youth bulges' become especially violent, or non-linear relationship between 'youth bulges' and the intensity of protests. Thus, the results, obtained above, allow us to refute 'Huntington's hypothesis' (H2) for the case of non-violent protests. Note that similar results about the absence of 'special

threshold' crossing which 'youth bulge' become especially prone to trigger political violence, were previously obtained for armed conflicts, terrorist activity and violent riots (Urdal 2006) and for the intensity of political repressions (Nordas and Davenport 2013). Thus, our results are consistent with previous research. It is possible to conclude that the effect of 'youth bulges' on the intensity of protests seems to be monotonic.

Robustness check

In robustness check section we utilize controls, described in Method Section, to verify our results obtained above. Note that our results remain stable. The results are presented in Table 4.

The results presented in Table 4 are quite consistent with those obtained in previous section. All two operationalizations of 'youth bulges' are positive statistically significant predictors of the intensity of non-violent antigovernment demonstrations. The results allow us to verify the validity of our first hypothesis (H1). Additionally, the binary variable of 'youth bulges' (15-24) is insignificant. Thus, our tests do not support so-called 'Huntington's hypothesis' (H2).

Note that our results are robust and consistent with the results reported in Table 4 even if we operationalize 'youth bulges' as the proportion of young people (ages 15-24/ages 15-29) in total population (see Appendix 2). However, reported AIC values suggest that models with 'youth bulges' measured as the proportion of youth (ages 15-24/ages 15-29) in total adult population fits our data better. Thus, we suppose that 'youth bulges' operationalized as the proportion of young people (ages 15-24/ages 15-29) in total adult population are more reliable measurement.

Table 4. Negative binomial fixed-effect regression: Youth bulges (ages 15-24 and 15-29) as predictors of the intensity of non-violent protests, 1950-2008

	Dependent variable:		
	Antigovernment demonstrations		
	(1)	(2)	(3)
Intercept	-3.989***	-4.234***	-1.123
	(.906)	(.927)	(.704)
Youth bulge (15-24)	.055***		
	(.011)		
Youth bulge (15-29)		.046***	
		(.009)	
Youth bulges (binary)			.221
			(.118)
log(GDP per capita)	-.259**	-.251**	-.352***
	(.085)	(.086)	(.083)
log(Population)	.238***	.234***	.210***
	(.038)	(.038)	(.038)
Political Regime	-.086*	-.089**	-.095**
	(.034)	(.034)	(.033)
Urbanization	.030***	.030***	.031***
	(.005)	(.005)	(.005)
Education	.045	.043	-.007
	(.029)	(.029)	(.027)
Time fixed-effects	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes
Observations	4,875	4,875	4,875
Akaike Inf. Crit.	7326.039	7324.56	7349.744

*Note: *p<.05, **p<.01, ***p<.001*

CONCLUSION

In this paper, we focus on the influence of 'youth bulges'– the proportion of youth in adult population - on the intensity of non-violent protest activity. Previous studies have found that the increase in the proportion of young people in adult population can lead to an increased risk of political violence. However, studies related to the influence of the 'youth bulges' on the intensity of non-violent protest activity have hardly been conducted, although, the findings of previous work on youth demography and political violence suggest that young people may also be more likely to participate in non-violent protest activity.

In the introductory part, we have found that a straightforward analysis of the correlation between 'youth bulges' and the intensity of non-violent protests yields a somehow unexpected result, as in this case we find a significant negative correlation. However, we have found that in this case we are dealing with the effect of economic modernization and its consequences. The point is that, due to the well-known demographic transition mechanisms, in more developed countries the proportion of young people in the country's population is generally much lower. On the other hand, the intensity of non-violent protests in more developed countries is generally higher. This is accounted for by a few mechanisms. For example, the economic growth tends to be accompanied by the growth of the proportion of democracies; as a result proportion of non-autocratic states among the countries with higher income levels tends to be significantly higher than in lower income countries. In other words, more developed countries tend to be much less authoritarian, which increases the number of peaceful demonstrations, whereas full autocracies are almost by definition rather strong inhibitors of peaceful antigovernment protests and decrease of their number among more economically developed countries is bound to be associated with the increase in the intensity of antigovernment protests. Another example is the urbanization. More developed countries tend to have much smaller proportion of the young population as they finished their demographic transition, but they tend to have much higher urbanization level, whereas the urbanization has been shown to be a rather strong factor increasing the intensity of protest activity.

Modernization leads to decrease of the young population which would per se inhibit protest activity. But on the other hand, it unleashes some powerful forces like democratization or urbanization that may overwhelm the inhibiting influence of the decreasing 'youth bulges'. These theoretical expectations have been supported by the performed tests. After the introduction of the relevant controls the 'youth bulge' turns out to be a factor increasing the intensity of protests, whereas without these controls it turns to be a predictor of a relatively low non-violent protest intensity.

Also, we suggest that there could be a certain threshold, crossing which ‘youth bulges’ significantly increase the risk of destabilization activity, as noted by Huntington. Thus, in this paper, we have tested the influence of ‘youth bulges’ on the intensity of non-violent protest activity. In addition, we have tested the so-called "Huntington's hypothesis" about the non-linear link of ‘youth bulges’ and non-violent protests.

As a result of testing, we find that all two suggested measurements of ‘youth bulges’ demonstrate significant similarities. Without controls, both proposed operationalizations of ‘youth bulges’ turn out to be negative statistically significant predictors of non-violent protest activity. However, when we add the relevant control variables of modernization (such as GDP per capita, PPP, non-autocratic political regime, education expansion and urbanization), we detect a statistically significant positive correlation between the ‘youth bulges’ (using both operationalizations) and the intensity of non-violent protests. Note that significant similarities of two models using different operationalization of ‘youth bulges’ contribute to the continuing discussion of how to operationalize ‘youth bulges’. The obtained results suggest that there is no significant difference between two ‘youth bulges’ operationalizations. However, for the future research we recommend using both operationalizations to acquire more information about relationship between two variables of interest.

However, the results of our testing failed to support the validity of the so-called ‘Huntington hypothesis’, at least for the case of non-violent protest activity. These results suggest that there is no “threshold”, crossing which ‘youth bulges’ increase the likelihood of non-violent protest demonstrations.

Finally, we would like to emphasize that the fact that, in the absence of controls, there is a statistically significant negative correlation between the proportion of young people in the total adult population and the intensity of non-violent protests is of its own interest. Indeed, it follows from this point that by itself the knowledge that in country A we find a very high proportion of young people, and in country B it is very low predicts that we should expect a higher intensity of non-violent protests in country B rather than in country A. Hence, one should be very couscous and not rush to fast conclusions when considering this predictor. The modernization that is normally accompanied by decreasing fertility and hence decreasing ‘youth bulges’ creates powerful forces such as urbanization or democratization that by far compensate the decrease of ‘youth bulges’. However, our findings imply that without the declining ‘youth bulges’ the modernization would produce a significantly more pronounced growth of the intensity of non-violent protests.

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Appendices

APPENDIX 1

Descriptive statistics

	n	mean	Std. deviation	Median	Min	Max
'Youth bulges' (ages 15-24)	9296	26.63	6.43	28.72	10.02	42.63
'Youth bulges' (ages 15-29)	9296	37.74	7.90	40.48	15.90	53.63
GDP per capita (PPP)	6966	5085.19	5728.73	2752.50	207	42916
Population	9296	30552.19	113453.60	6466.47	25	1390110.39
Political Regime	7316	0.91	7.49	1	-10	10
Urbanization	9296	46.24	25.06	44.68	1.73	100
Education	6903	17.49	20.22	9	0	116

Negative binomial fixed-effect regression: The relationship between 'Youth bulges' (ages 15-24 and 15-29) in total population and the intensity of non-violent protest activity

	Dependent variable:		
	Antigovernment demonstrations		
	(1)	(2)	(3)
Intercept	-3.742***	-3.564***	-1.123
	(.858)	(.856)	(.704)
Youth bulge (15-24) (total pop.)	.100***		
	(.018)		
Youth bulges (15-29) (total pop.)		.075***	
		(.014)	
Youth bulges (15-24)(total pop.)(binary)			.221
			(.118)
log(GDP per capita)	-.249**	-.260**	-.352***
	(.087)	(.087)	(.083)
log(Population)	.210***	.200***	.210***
	(.038)	(.038)	(.038)
Political Regime	-.089**	-.094**	-.095**
	(.033)	(.033)	(.033)
Urbanization	.028***	.028***	.031***
	(.005)	(.005)	(.005)
Education	.016	.005	-.007
	(.027)	(.027)	(.027)
Time fixed-effects	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes
Observations	4,875	4,875	4,875
Akaike Inf. Crit.	7320.574	7323.883	7349.744

*Note: *p<.05, **p<.01, ***p<.001*

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