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Youth Crime in Colombia*

Efecto de la población joven sobre la criminalidad en Colombia

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Abstract

In some countries, the increase in the youth population is connected to greater criminal activity. In the case of Colombia, different studies support the idea of providing socio-economic possibilities for young people to avoid being linked to illegal and criminal activities. Based on these precedents, this document examines whether the increase in the youth population in Colombia is directly connected to municipal crime during 2000-2010, a period in which those born in the 1990's reached their teenage years and could participate in urban crime. For this study, economic and other variables of total and juvenile population are constructed for youth between the ages of 15-24, as well as variables in population density and political polarization incorporating the crime index proposed by (Durán, López, & Restrepo, 2009). The proposed model estimates that youth population density, population growth, conflict actions and political polarization are associated with an increase in crime. Also, greater development and political polarization can lead to an environment of less crime.

Keywords: Crime, youth, population density; conflict.

Resumen

En algunos países, el aumento de la población joven se relaciona con mayor actividad delictiva. Para el caso colombiano, diferentes estudios apoyan la idea que brindar posibilidades socio económicas a los jóvenes para evitar que se vinculen con actividades ilegales y criminales. A partir de lo anterior, este documento examina si la mayor presión demográfica de población jóven en Colombia se asocia con criminalidad municipal durante 2000-2010, periodo en el cual los nacidos en la década de los 90's se hicieron jovenes y pudieron estar vinculados con criminalidad municipal. Para esto, se construyen variables económicas y variables de población total y juvenil entre 15-24 años, variables de concentración y polarización política con el índice de criminalidad propuesto por (Durán, López, & Restrepo, 2009). El modelo propuesto estima que la densidad de población jóven, el crecimiento de población, las acciones de conflicto y la polarización política se asocian con un aumento de la criminalidad. También, mayor desarrollo y polarización política explican menor criminalidad.

Palabras clave: Crimen, juventud, densidad poblacional, conflicto.

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Introduction

In the last decade Colombia implemented security policies to reduce crime in cities and municipalities. However, a large part of the crimes are committed by gangs and criminal networks formed by young people, who are involved in microtrafficking and are prone to be linked to homicides. Therefore, any public policy that seeks to reduce crime should take into account the size of the youth population to divert them from crime activities by better access to secondary and higher education, youth employment, health coverage and the influence of state control in regions with conflict situations. These policies give stability to the regions when the youth have increased economic and social possibilities, avoiding risks of criminality especially where there is a greater density of young population and low economic conditions that affect vulnerable regions with low state presence. In particular, the population composition of the regions is a risk factor for crime that has not been widely studied at the national level, especially when the youth population cohorts represent a significant proportion of the total municipal population, which being a susceptible population when impacted by the economic conditions of the regions can raise the level of crime in which young people participate. Therefore, this document pursues the question is there any link between the size and density of the youth population in the regions with the variation of crimes that affect public security? This is done by means of a crime indicator composed of homicides, thefts and injuries, which serves as a measure of regional insecurity to compare with the size of the resident youth population along with economic, political and conflict control variables. At the end of the document, it is shown how the conditions of regional scarcity, youth population growth rates, population density and the political regime are associated with an increase in regional crime.

The crime rate used (Durán *et al*., 2009) is composed of crimes that affect regional security compared to the size of the population between 15-24 years to define population density per km^2, economic variables, political dependence and disputes among armed groups. These variables show that the demographic changes in the last decade explain the variations in municipal crime. The rest of the document is structured as follows: The next section (1) presents a background on population pressure and scarcity, youth dynamics and violence, economic development and crime, gender and violence. Section (2) shows the literature that supports the construction of the variables used, section (3) describes the empirical strategy and the

identification of the results that serve to motivate the results of section (4) as an input to raise the conclusions in section (5).

Background

Classical theories (Malthus, Winch & James, 1992). consider the effects of population growth on the scarcity of food in developed and developing countries, to justify the control of the population of groups vulnerable to environmental conditions. In this scenario, the future welfare of the population is undermined when there is inequality and the authorities do not implement public policies in favor of the vulnerable population, often leading to illegal work activities. Below is the literature that relates to changes in population and the groups affected by environmental conditions, as occurs with men and women between 15-24 years, which ends up being the most affected population with the highest density of young population.

Population Pressure and Scarcity

Countries with rapid growth in population size and density experience degradation, scarcity of natural resources and are more conducive to violent conflicts (Ehrlich & Ehrlich, 2009), (Ehrlich & Ehrlich, 1996), (Lujala, Gleditsch, & Gilmore, 2005). Additionally, the inter-group dynamics associated with polarization and horizontal inequality generate competition and scarcity of natural resources that motivate episodes of violence, where the demographic transition of the percentage of the young population is a robust predictor of changes in the homicide rate and the observed level of misery (Sandoval, 2014). Regional inequality is a valid indicator of structural scarcity when there are long-term processes and social segmentation and where events that are manifested by the interaction between population pressure in a specific age group and horizontal inequality lead to increases in the risk of violence (Østby, Urdal, Tadjoeddin, Murshed, & Strand, 2011).

These periods can have high or low levels of violence, associated to exogenous shocks that trigger permanent effects in the episodes of violence, mainly when there is knowledge transmission between adults and young delinquents (Gaviria, 2000), (Stacey, Carbone-López, & Rosenfeld, 2011). This determines different crime conditions when there are demographic patterns in the regions and leads to an excess of social disorganization that allows groups or regional zones that are more violent than others (Grubesic, Mack, & Kaylen, 2012), (Oh, 2005) .

Youth dynamics and violence

In the 1980's crime literature focused on the environment as his main reason, which allowed generating differences between the types of crimes committed in urban and rural areas, with geographical distribution being an important factor in delinquency committed within the regions.

The latter has shown that cities, despite having greater police capacity, attract individuals with criminal tendencies. For this reason, the most recent literature focuses on the factors associated with the individual and the population as determinants of persistent criminal activites in the regions (Brunborg & Urdal, 2005), (Schaefer, 2012). This shows a relationship between the age of people with the tendency to commit crimes (Lauritsen, 1998), (Sampson & Laub, 1995), mainly during adolescence, as it is a period where young people are vulnerable, and are prone to become involved in illegal activities and criminal acts (Hart, Atkins, Markey, & Youniss, 2004). However, this behavior lessens with increasing age, being relevant to analyzing the nature of youth gangs as a result of social exclusion in young people who develop in marginal areas with high unemployment, instability and poverty (Leung & Ferris, 2008), (Oyefusi, 2008).

This is pronounced when the size of the youth population exceeds the critical level of 20 per cent with respect to the total population[1], an aspect that makes regions more prone to violent conflicts (Huntington, 1996), (Urdal, 2004), (Urdal, 2005), (Urdal, 2006) that manifest themselves in greater criminality. In the Colombian case, despite the decreases in conflict actions and homicides in general in the last decade, there have been increases in other crimes with a greater participation of young people, noting a specific impact of age with changes in behavior of individuals when they belong to cohorts of 15-19 and 20-29 years, where there is a higher density of youth population. This type of population is more likely to be involved in crime and is highly represented in statistics of homicide rates for recent periods 1998-2002 and 2003-2006 (Bonilla, 2010).

Economic development and crime

Several authors (Collier & Hoeffler, 1998), (Collier, 1999), (Collier, 2000) identify variables that explain crime activity from the level of development existing in a country or in certain regions. Therefore, this document sug-

[1] The total population for the cense 2018 it was 48'258,494. Where the participation of the young people 15-19yr (Female: 4,26%, 2055811,844. Male: 4,46%, 2152328,832). 20-24yr (Female: 4,43%, 2137851,284. Male: 4,49%, 2166806,381). 25-29yr (Female: 4,20%, 2026856,748. Male: 4,16%, 2007553,35). (DANE, 2018)

gests proxy variables that relate the level of crime to regional development, to indicate that differences in development conditions explain regional violence (Akçomak & Weel, 2012), (Fox & Hoelscher, 2012). In this way, in order to improve the economic conditions of the regions, it is necessary to provide education, access to health services, employment and quality of life to the young and low-income population. Additionally, as in the case of women of reproductive age, there must be greater support, including situations that will contribute to making the young population less prone to be involved in delinquency activities.

This is relevant because the demographic changes by age cohort tend to explain aggregate crime rates when there is high unemployment and inflation in the regions that affect the young population (Jones & Chant, 2009), (Nunley, Seals Jr, & Zietz, 2011), (Wang & Arnold, 2008).

Gender and violence

Authors such as (Hardgrove, Pells, Boyden, & Dornan, 2014) suggest that young people are a determining social group in the forms of violence present in the regions, particularly young men who tend to be more involved in crimes at an early age (Hammond & Yung, 1993), (Wilson & Daly, 1985), especially in regions where there are natural resources or commercial activities that encourage the bonding of young men (Hoffman, 2011), (Shepler, 2014), (Karandinos, Hart, Castrillo, & Bourgois, 2014). In some cases, the prediction of violence and homicides increases when there are more young men than the rest of the population (Loeber *et al*., 2005) as both victims and victimizers (Cardona *et al*., 2005), (Cruz, 2011), without ignoring the violence generated by young women and the gender gap (Ness, 2004), (Campbell, 2013) (Steffensmeier, Zhong, Ackerman, Schwartz, & Agha, 2006).

Construction of variables

Following the results proposed by the literature, we seek to determine if there is a relationship between the level of municipal crime with the highest density of youth population together with regional economic and political conditions. For this, aggregate data from different municipalities were taken using crime variables associated with crimes that affect citizen security, population growth of the regions, the youth population between 15-24 years, economic conditions to establish income characteristics and regional development, conditions of conflict and political regime to know

the presence of disputes between armed groups ultimately combined with the level of polarization and electoral participation.

To establish the level of public security in Colombia, (Restrepo, Aponte, & Aponte, 2009) present an index composed of two subsets. The rate of crime and armed conflict, calculated using major components that weigh according to the contribution of each crime associated with crime and conflict. In this case, the crime rate (CI) is used, composed of homicides not associated with armed conflict, in addition to robbery and battery (physical attacks on others).

The weight assigned to each crime in the index number was made considering the assessment of each criminal act within the crime (Durán *et al*., 2009). In this way, the numerator corresponds to the weight of crime in the level of insecurity and the denominator will allow to restrict between maximum and minimum values, being useful to normalize the indicator. Thus, using the rate of each crime per 100,000 inhabitants, the normalized index is constructed based on the minimum value given by the average of the crimes, which allows having an index with values between [0.1] that distinguishes municipalities and cities safe with low crime and insecure with high crime. The variables used are constructed from the following literature and are described at the end of document 1:

Youth population

Several authors suggest variables to show the excess and concentration of youth population in the regions (Vinasco-Martínez, 2019), (Urdal, 2004), (Urdal, 2005), (Urdal, 2006), an event that allows analyzing the effect of this population on crime and the risk of internal conflict (Collier, 2000), (Goldstone, 2002), (Huntington, 1996), (Barakat & Urdal, 2009) given by the population cohort between 15-24 years in relation to the total population. This leads the population to participate in the prevention of crime associated with youth, as indicated by broken window theory (BWT) (Ren, Zhao & He, 2019), (O'Brien, Farrell & Welsh, 2019), (Browning, Soller & Jackson, 2015), (Chappell, Monk-Turner & Payne, 2011), (Hinkle, & Yang, 2014) and with this prevent the youth recruited by gangs from being punished with measures such as jail, which is not always the best alternative and ends up harming their futures (Coimbra & Briones, 2019), (Aizer & Doyle Jr, 2015), (Landersø, 2015), (Eren & Mocan, 2017), (Bhuller, Dahl, Løken & Mogstad, 2020).

For this case, the data used corresponds to the municipal population in this age group along with the total population, which allows building a

measure of youth population concentration to show whether in Colombian regions where said population exceeds a certain critical level with respect to the total population and there is presence of armed groups, the regions would be more prone to present criminality. In this way, when there is an excess of young adult population, social disturbances can occur in terms of violence, leading the following generations that do not find economic possibilities in their regions to fight for their political and religious ideals (Urdal, 2008), (Urdal & Hoelscher, 2009), (Urdal & Hoelscher, 2012)

Population density

The intraregional population changes illustrate the temporal distribution of different age groups in the municipal composition, as it was presented in a large part of the 20th century (Florez, 2000). For the Colombian case, the population grew at high rates during the 1970's and those born in that period became young adults in the 80's, a period in which the highest levels of homicides were evident (Bonilla, 2010), controlling problems in measuring violence (Arjona & Otálora, 2011). The case of analysis of this study, follows the same line of analysis but focuses on those born in the 1990's who became young adults in the next decade, a period in which the country enjoyed a decrease in the levels of violence and armed conflict (Sandoval, 2014), (Sandoval, 2018).

Despite this, in some regions the effects of the conflict are reflected in the behavior of crimes that affect public security. Especially when there is a high density of youth population within a given area.

Regional conditions

The literature on crime and conflict proposes factors that affect insecurity when the level of development and economic conditions promote crime, especially by the influence of low levels of schooling and difficulties in accessing the labor market. These conditions encourage young criminals to remain in illegal activities that generate greater profits (Collier & Hoeffler, 1998), (Hauge & Ellingsen, 2001), (Hegre, 2001), (Henderson & Singer, 2000). In Colombia, crimes are not recorded with a reference to the concentration of young population, regional conditions and the presence of conflict that determine persistent criminal patterns over time and affect citizen security. To show how the level of regional development affects crime (Urdal, 2004), (Urdal, 2005), proxy variables are used3 of the per capita municipal product, level of regional schooling and a variable that

captures various aspects of municipal development such as the infant mortality rate.

Political regime

The political regime in the regions is associated with the conditions of crime and conflict, under the premise that democracy has a pacifying effect at the local level (Hegre, 2001). Hence, the relationship between the predominant political regime in the regions with the level of criminality can be established. Thus, when there is active conflict due to the actions that occur between groups, this relationship can take the form of an inverted-U when intermediate regimes are more likely to present conflict than democracies and autocracies (Urdal, 2008), (Barakat & Urdal, 2009), (Urdal & Hoelscher, 2009). For this, polarization variables3 are used following (Esteban & Ray, 1994), (Montalvo & Reynal-Querol, 2005), electoral participation and concentration variables according to (Davies, 1980), using the municipal votes obtained for Senate, House and Presidency, with measures of political regime with ranks between (0) for low polarization / participation and (1) for high polarization / participation. Also, quadratic measures are included that serve to analyze the inverted-*U* effect of the regime on regional crime.

Empirical strategy and identification

A beta estimate is used to study the impact of the youth population on municipal crime in Colombia. The thresholds in the estimation control for the presence of armed conflict in the change of the crime index and consider the changes in the level of crime according to the level of the youth population, and economic and political conditions at the municipal level. It should be noted that the crime rate is an added municipal measure given by rates of homicides, robberies and standardized injuries according to the weightings observed in the effect of these crimes on public security, but crimes committed solely by young people are not recorded, since multiple crimes that affect each city in Colombia differently are being ignored.

The strategy is suitable for continuous proportions in the response variables, the maximum likelihood estimators use beta probability that restricts the sample to the presence of armed conflict, the distribution in the crime index is a function of the explanatory variables and extreme values are ignored so to concentrate the analysis on the values that present municipal crime during 2000-2010. The estimate integrates individual heterogeneity and the effect on the proportions of the explanatory variables,

since the crime index has continuous values in the interval (0,1), so the beta distribution serves to model proportions since its density has different forms according to the values of the parameters that index the distribution (Ferrari & Cribari-Neto, 2004).

Thus, if municipalities have an active or inactive presence of armed conflict exceeding the threshold of the variable, the level of crime in the municipality is considered to be the effect of changes in the proportion of the parameters obtained by maximum likelihood of explanatory variables. With these one can know the level of criminal activity in the regions and use the distribution of the resulting index without leaving the effect on the ends of the distribution to recognize the effect of crime in the municipalities considered (Pérgolis & Ramírez-Cely, 2015), (Paolino, 2001), (Cribari-Neto & Vascon-cellos, 2002). The variable zi, t controls for the presence of actions of armed conflict, the municipal crime index2, is constructed from the methodology proposed by (Durán *et al*., 2009) that uses rates of homicides, thefts and injuries per 100,000 inhabitants, the index composed of the rates in these crimes is then generated by weighing (0.4) homicides, (0.3) thefts and injuries (0.3), assigned according to the effect observed by (Restrepo *et al*., 2009) of the crimes in public security. With this, the estimation proposed by (Urdal, 2006) on pressure of young population in the levels of conflict and criminality is formulated as follows:

$$Y_{i,t}, 0 \leq Y_{i,t} \leq 1: \text{Criminality Index}$$

$$z_{i,t} = \begin{matrix} 1, & z^*_{i,t} > 0 \\ 0, & z^*_{i,t} < 0 \end{matrix}$$

$$f\left(Y_{i,t}|z_{i,t};\alpha,\beta\right) = \frac{\Gamma(\alpha+\beta)}{\Gamma(\alpha)+\Gamma(\beta)} Y^{\alpha-1}(1-Y)^{\beta-1}, (\alpha,\beta) > 0, \Gamma(.): \text{Gamma function}$$

$$\ell(\alpha,\beta) = \sum_{i=1}^{N} \text{Ln}\,\Gamma(\alpha+\beta) - \left(\text{Ln}\,\Gamma(\alpha) + \text{Ln}\,\Gamma(\beta)\right) - (\alpha-1)\text{Ln}\,(Y) + (\beta-1)\text{Ln}\,(1-Y)$$

Discussion of results

The relationship of the population variables, regional conditions and conflict with the proposed crime indicator together with the marginal effects due to greater density of total and young population on crime are presented in the results tables 4 and 5. The results serve to approximate the research problem proposed that the highest density of young people between 15 and 24 years during 2000-2010, increases the risk of crime and is reflected in positive and significant coefficients. Estimates that consider proxy variables for population and youth density growth have a significant impact on municipal crime, even in regions where there are disputes between groups, population density maintains its effect on crime.

When the variables of population growth and increase in youth density are combined with variables of conflict and polarization / political participation, a positive and significant relationship with regional crime is presented, showing that when there are conflict actions in the regions they impact electoral results, a circumstance that reflects greater polarization and reduces the participation in elections of national authorities. With this impact, there is a greater proportion of young people in the regions that may be involved in crimes that affect public security. The controls of the political regime in terms of participation, consider the vote obtained by the candidates with respect to the totality of municipal votes, as well as the concentration of variables resulting if the voting is grouped around a number of candidates, an event that is reflected in the degree of abstention of the voters and in the null votes. On the other hand, the polarization variables have a discrete measure given by a standardization parameter, the contributions of the highest votes and the degree of sensitivity to polarization, which is added to the contribution of the candidates in the elections for the individual product of the differences of the contribution from the total votes. These political controls, in certain cases, are positive and significant when it comes to polarization and abstention. Therefore, as the regions have less polarization and electoral abstention, they may have more stable democracies with a local pacifying effect, where the more remote municipalities of autocratic systems will be less likely to experience regional crime. The quadratic terms in some events indicate that there is an inverted U effect that shows a relationship between the political regime and crime, which is why municipalities with intermediate political regimes are more prone to evidence criminality (Hegre, 2001), (Urdal, 2005).

The level of development given by the infant mortality rate captures aspects of municipal development and local crime (Urdal, 2004), (Urdal, 2005), (Arévalo Rodríguez, Ramírez & FESCOL, 2014). In all the specifications it turns out to be negative and significant, showing how, as municipal development increases, crime is reduced, especially when there is growth of a youth population between 15-24 years old and a higher population density. The opposite occurs with the variables of current income and schooling that are positive and significant in all cases, showing that the regions with higher current income and greater coverage of secondary education have greater crime.

Conclusions

This document takes an empirical approach that serves to deduce the importance of regional demographic conditions, especially when there is high density and greater growth of youth population with respect to the rest of the population. The results approximate the effect of the young population on the risk of crime, which closely follows the literature reviewed by the lower possibility that the youth population has of accessing the local labor market, being prone to participate in crimes such as theft, physical assault and homicides. All this phenomena end up affecting the regional criminality when these causes are integrated in the regions and increase the municipal insecurity, which by not being controlled can be persistent over time.

There is evidence of the impact that youth population has on the increase in municipal crime. Using different specifications that include such controls and their growth, it was pointed out how, as the regions experience critical levels in the size of the youth population, they tend to be more prone to show increases in crime. Particular situation in crimes occur where young people have greater participation, as a consequence of the economic conditions of the regions that end up marginalizing the young population and influence them to be involved in crimes that affect public security.

The youth population treated in this document was born during the 1990's, one of the most violent periods in the history of Colombia, where there were high homicide rates, conflict actions were increased and regional inequality increased. This population came of age during the following decade (2000-2010), but in spite of the reduction in the actions of conflict and in crimes such as homicides in the major cities and in the most representative municipalities at the departmental level, the level of insecurity of the regions increased. This situation arose as a consequence of regional conditions, which in some cases due to a higher level of development in-

creased insecurity and in others, due to lower economic inequality increased crime due to the greater density of young people in the regions.

In the same way, the relation of the political regime with the criminality is robust and significant, thus a greater polarization / concentration / electoral abstention in the regions affects the increase of the criminality. The above, follows closely the local literature that supports the idea that in some regions of the country, the high voter turnout registered during this decade was due to the incidence of paramilitary and guerrilla groups that affected the electoral results in the regions where these groups were present. This phenomenon ended up affecting municipal democracy and consolidating autocratic systems resulting from the greater domination of political parties, an aspect that ends up altering peace in the regions and motivates regional crime. In particular, this occurs when the scarcity conditions derived from municipal income affect the entry into the labor market for young people, who face unemployment due to labor supply limitations in the regions.

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Tables of results

Table 1: Descriptive statistiCS

Obs.		Mean	St. Dev	Min.	Max.
Population variables					
Youthbulges	7,478	0.1738	0.029	0.0507	0.4424
Pobjov1524	7,478	7,727.76	45,035.54	231	1270540
Pobtot	7,478	46,591.44	296,023.1	1,455	1.46e+07
Density variables					
Lnpobjov1524	7,478	7.9567	1.0880	5.4424	14.0549
Lnpobtot	7,478	9.7232	1.0911	7.2827	16.4938
Denspobjov	7,478	31.3293	111.03	0.0083	1876.73
Creyouthbulges	7,478	-0.0170	0.1589	-0.8420	0.4288
Crepobjov1524	7,478	0.0452	0.0810	-0.6775	0.5125
Condition variables					
Lningcte	7,478	6.3215	2.8015	0	13.5592
Lnidh	7,478	3.7158	0.6827	0	4.5488
Mortinf	7,478	27.9093	206.89	0	12041.1
Cobmedalsecof	7,478	0.3165	0.2692	0	13.5623
Cobmedalsecof2	7,478	0.1727	3.0044	0	183.9367
Lningcte2	7,478	12.6431	5.6030	0	27.1184
Conflict variables					
bdestparneo	7,478	0.1001	0.3002	0	1
bdestgue	7,478	0.2766	0.4473	0	1
Political regime variables					
hhi	7,478	0.2457	0.1661	0	0.9301
ipmg	7,478	0.3816	0.1895	0	0.9643
pd	7,478	0.1924	0.0687	0	0.5555
ia	7,478	0.0263	0.0227	0	0.4226
rq	7,478	0.1190	0.0522	0	0.2369
hhi2	7,478	0.0879	0.1191	0	0.8652
ipmg2	7,478	0.1815	0.1740	0	0.9300
pd2	7,478	0.0417	0.0318	0	0.3086
ia2	7,478	0.0012	0.0043	0	0.1786
rq2	7,478	0.0169	0.0130	0	0.0561

Table 2: Description of variables

Variable		Source
Criminality		
Criminality Index	$IC = (\frac{thom\ (0.4) + tles(0.3) + thur(0.3)}{\Sigma(thom(0.4) + tles(0.3) + \ + thur(0.3)) - (\overline{\overline{del}})})(100)$	CERAC
Rate of Homicides	thom = $(homi_{i,t}/pob_{i,t})(100000)$	CERAC
Rate of Injuries	tles = $(les_{i,t}/pob_{i,t})(100000)$	CERAC
Rate of Thefts	thur = $(hur_{i,t}/pob_{i,t})(100000)$	CERAC
Average of Crimes	del = $(thom_{i,t}+tles_{i,t}+thur_{i,t})/3$	CERAC
Homicides	homi: urban homicides	CERAC
Injuries	les: urban injuries	CERAC
Thefts	hur: urban thefts	CERAC
Population		
Youthbulges	ybul = $pobjov1524_{i,t}/pobtot_{i,t}$	DANE
Total Population	pobtot: urban total population	DANE
Youth Population	pob1524: urban population between 15-24 ages	DANE
Population Density		
Log total population	lnpobtot = Ln(total urban population)	DANE
Log youth population	lnpob1524 = Ln(urban population between 15-24 ages)	DANE
Population Density	denpot = $pobtot_{i,t}/superficie_i$	DANE
Youth Population Density	denpjov = $pob1524_{i,t}/superficie_i$	DANE
Increase in youthbulges	cybul = $(ybul_{i,t}-ybul_{i,t-1})/ybul_{i,t}$	DANE
Increase population 15-24	cpob1524 = $(pob1524_{i,t}-pob1524_{i,t-1})/pob1524_{i,t}$	DANE
Increase in Youth Population Density	cdenpjov = $(denpjov_{i,t}-denpjov_{i,t-1})/denpjov_{i,t}$	DANE

Table 3: Description of Variables

Variable		Source
Regional Conditions		
Log current income	lningcte = Ln(current income $_{i,t}$)	DANE
Log current income squared	lningcte2 = Ln((current income squared)^2)	DANE
Log human development indicator	lnidh = Ln(human development indicator $_{i,t}$)	DANE
Official Secondary School Students	talsecof: urban official secondary school students	DANE
Secondary School Coverage	cobsecof = ((talsecof$_{i,t}$)/(pob10a14$_{i,t}$+pob15a19$_{i,t}$))	DANE
Secondary School Coverage Squared	cobsecof2 = (cobsecof)^2	DANE
Infant Mortality Rate	mortinf = (children deaths $_{i,t}$/total born$_{i,t}$)(1000)	DANE
Conflict Conditions		
Combat between State and Guerillas	cl$_{e,g}$: number of combat between state and guerillas	CERAC
Combat between State and Paramilitaries	cl$_{e,pn}$: number of combat between state and neo(paramilitares)	CERAC
Guerilla Unilateral Actions	au$_g$: violent events with guerrilla participation	CERAC
State Unilateral Actions	au$_e$: violent events with state participation	CERAC
Paramilitary Unilateral Actions	au$_{pn}$: violent events with neo(paramilitares) participation	CERAC
Disputes between State & Paramilitary	bdestparneo = (cl$_{e,pn}$+au$_{pn}$)/(cl$_{e,pn}$+au$_{pn}$+au$_e$)	CERAC
Disputes between Statae & Guerillas	bdestgue = (cl$_{e,g}$+au$_g$)/(cl$_{e,g}$+au$_g$+au$_e$)	CERAC
Political Regime		
Herfindalh-Hirschman	Hhi = (votes$_i$/totalvotes$_i$)^2	Registraduria
Municipal Participation	ipmg = Max(votes$_i$/totalvotes$_i$)^2	Registraduria
Discrete Polarization	pd = k*$\sum c_i^{1+\alpha} \sum_{j \neq 1} c_j$ k = $(\sum \text{Max } c_i)^{2+\alpha}$	$\alpha = 1.6$
Abstention Indicator	ia = (whitevotes$_i$/tvmtotalvotes$_i$)	Registraduria
Reynal-querol Polarization	rq = $(c_1(c_1(1-c_1)))+...+(c_4(c_4(1-c_4)))$	Registraduria c_1, c_2, c_3, c_4: 4-urban highest votes
Herfindalh-Hirschman Squared	hhi2= (hhi)^2	Registraduria
Municipal Participation Squared	ipmg2=(ipmg)^2	Registraduria
Discrete Polarization Squared	pd2=(pd)^2	Registraduria
Abstention Indicator Squared	ia2=(ia)^2	Registraduria
Polarization rq Squared	rq2=(rq)^2	Registraduria

Table 4: Estimation 2000-2010

Variables Explicativas	(1)	(2)	(3)	(4)	(5)
Population					
Youthbulges	1.5529		0.6551		1.0244
	(2.8907)		(0.4431)		(0.8843)
Pobtot	-4.86e-08***				
	(2.30e-08)				
Pobjov1524	1.20e-06***		6.43e-08		
	(2.73e-07)		(2.72e-07)		
Population Density					
Lnyouthbulges	0.2465				0.0012
	(0.4146)				(0.0168)
Lnpobtot	-0.2299		0.0151		
	(0.4180)		(0.0148)		
Lnpobjov1524					0.0001***
Denspob					(0.0001)
			0.0008***		
Denspobjov			(0.0001)		
				-0.1932	
Credenspobjov				(0.1305)	
		-0.4583**		-0.5235***	
Creyouthbulges		(0.2652)		(0.2492)	
		-0.1387			0.1600***
Crepobtot		(0.1410)			(0.0747)
		0.0877		0.2478	
Crepobjov1524		(0.2402)		(0.2256)	
Regional Conditions					
Lningcte	0.0383***				
	(0.0053)		0.1257***		
Lnidh					
			(0.0230)		
Lnidh2				0.0688***	
				(0.0123)	
Lningcte2		0.0212***			
		(0.0028)			
Cobmedalsecof			0.1493**		
			(0.0234)		
Cobmedalsecof2				0.0117***	
				(0.0006)	
Mortinf					-0.0005***
Conflict Conditions					(0.0003)
bdestparneo				0.1474***	
				(0.0371)	
bdestgue				0.1160***	
				(0.0275)	
Political Regime					
hhi	-0.1783				-1.4784***
	(0.2085)				(0.3322)
ipmg	0.1755		0.0240		0.5597***
	(0.1876)		(0.0595)		(0.2096)
pd	0.7365***			0.9903***	
	(0.1667)			(0.1688)	
ia			3.0271***		
			(0.4870)		
rq		-0.8807***	-0.3009		
		(0.1901)	(0.2043)		
hhi2		-0.5841***			0.9162***
		(0.2842)			(0.2363)
ipmg2		0.3340		-0.0465	
		(0.2183)		(0.0526)	
pd2					
ia2				4.7983***	
				(1.7674)	
rq2					
Constant	-6.1085***	-5.0248***	-5.6968***	-5.5564***	-5.0660***
	(1.2384)	(0.1579)	(0.2635)	(0.2139)	(0.2595)
N	7470	7470	7470	7470	7470
Log likelihood	30479.189	30464.282	30532.471	30461.486	30479.235
AIC	-60936.38	-60910.56	-61042.94	-60902.97	-60934.47
BIC	-60860.27	-60848.3	-60966.84	-60833.79	-60851.45

Table 4: Continuation

Variables Explicativas	(6)	(7)	(8)	(9)	(10)
Population					
Youthbulges	-0.2609				
Pobtot	(0.4007)				
Pobjov1524					
Population Density					
Lnyouthbulges				0.3279***	0.3346***
		0.0213		(0.1594)	(0.1588)
Lnpobtot		(0.0150)			
Lnpobjov1524	-0.0009		0.0601***		
	(0.0168)		(0.0163)		
Denspob		0.0001***			
		(0.0001)			
Denspobjov	0.0009***				
	(0.0001)				
Credenspobjov			-0.0626	0.11530	0.2212
			(0.1323)	(0.2329)	(0.2329)
Creyouthbulges			-0.2152	-0.3070	-0.2110
			(0.2481)	(0.3161)	(0.3196)
Crepobtot		0.0036			
		(0.0286)			
Crepobjov1524	-0.2502***		-0.1177	-0.2312	-0.2700
Regional Conditions	(0.0718)		(0.2261)	(0.3044)	(0.3059)
Lningcte					
		0.1282***			
Lnidh					
		(0.0233)			
Lnidh2					
Lningcte2					
Cobmedalsecof			0.1723***		
			(0.0144)		
Cobmedalsecof2					
Mortinf	-0.0005***	-0.0001***	-0.0004***	-0.0005***	-0.0006**
Conflict Conditions	(0.0002)	(0.0001)	(0.0002)	(0.036)	(0.0002)
bdestparneo	0.1378***				
	(0.0390)				
bdestgue	0.1123***				
	(0.0278)				
Political Regime					
hhi	-0.1350	-0.0660			
	(0.1667)	(0.0585)			
ipmg			0.0371		
			(0.0655)		
pd		0.8924			0.8424***
		(0.5215)			(0.1704)
ia	2.8382***		3.1860***	3.3702***	2.8263***
	(0.4791)		(0.5096)	(0.5429)	(0.5126)
rq			-2.3143***		
			(0.8781)		
hhi2	0.2130				
	(0.2199)				
ipmg2					
pd2		-0.2918			
		(1.1128)			
ia2					
rq2			7.6334***		
			(3.1307)		
Constant	-4.9335***	-5.7074***	-5.3311***	-4.3663***	-4.5123***
	(0.2082)	(0.2848)	(0.2243)	(0.3078)	(0.3112)
N	7470	7470	7470	7470	7470
Log likelihood	30515.782	30491.497	30463.889	30434.121	30446.33
AIC	-61007.56	-60962.99	-60903.78	-60852.24	-60874.66
BIC	-60924.54	-60893.81	-60820.75	-60796.89	-60812.39

Table 5: Marginal Effects

	[1] dy/dx	[2] dy/dx	[3] dy/dx	[4] dy/dx	[5] dy/dx
Population					
Youthbulges	0.0118826		0.0049696		0.0078303
	(0.02216)		(0.00349)		(0.00686)
Pobtot	-3.72e-10***				
	(0.00000)				
Pobjov1524	9.15e-09***		4.87e-10		
	(0.00000)		(0.00000)		
Population Density					
Lnyouthbulges					
Lnpobtot	0.0018862				9.73e-06
	(0.00317)				(0.00013)
Lnpobjov1524	-0.0017597		0.0001152		
	(0.0032)		(0.0148)		
Denspob					9.46e-07***
					(0.00000)
Denspobjov			6.79e-06***		
			(0.00000)		
Credenspobjov				-0.1932	
				(0.1305)	
Creyouthbulges		-0.0035145		-0.004012***	
		(0.00203)		(0.00191)	
Crepobtot		-0.0010636			0.001223***
		(0.00108)			(0.00058)
Crepobjov1524		0.0006726		0.0018993	
		(0.00184)		(0.00172)	
Regional Conditions					
Lningcte	0.0002933***				
	(0.00005)				
Lnidh			0.0009535***		
			(0.00018)		
Lnidh2				0.0005273***	
				(0.0001)	
Lningcte2		0.0001628***			
		(0.00003)			
Cobmedalsecof			0.0011331***		
			(0.00018)		
Cobmedalsecof2				0.0000904***	
				(0.00001)	
Mortinf					-4.38e-07***
					(0.00000)
Conflict Conditions					
bdestparneo					0.0011952***
					(0.00033)
bdestgue					0.0009104***
					(0.00026)
Political Regime					
hhi	-0.0013644				-0.0112998***
	(0.00161)				(0.00267)
ipmg	0.0013429		0.0001823		0.0042782***
	(0.00145)		(0.00045)		(0.00166)
pd	0.0056362***			0.0075885***	
	(0.00139)			(0.0014)	
ia			0.0229636***		
			(0.00429)		
rq		-0.0067527***	-0.0022833		
		(0.00157)	(0.00156)		
hhi2		-0.0044783***			0.007003***
		(0.00229)			(0.00184)
ipmg2		0.0025614		-0.0003565	
		(0.00174)		(0.0004)	
pd2					
ia2				0.0367669***	
				(0.01399)	
rq2					

Table 5: Continuation

	[6] dy/dx	[7] dy/dx	[8] dy/dx	[9] dy/dx	[10] dy/dx
Population					
Youthbulges	-0.0019841				
	(0.003)				
Pobtot					
Pobjov1524					
Population Density					
Lnyouthbulges				0.0025246***	0.0025714***
				(0.00127)	(0.00127)
Lnpobtot		0.0001629			
		(0.00011)			
Lnpobjov1524	-7.60e-06		0.0004611***		
	(0.00013)		(0.00012)		
Denspob		8.27e-07***			
		(0.00000)			
Denspobjov	7.45e-06***				
	(0.00000)				
Credenspobjov			-0.0004801	0.0008876	0.0017004
			(0.00101)	(0.0018)	(0.00181)
Creyouthbulges			-0.0016493	-0.0023634	-0.0016219
			(0.00189)	(0.00241)	(0.00244)
Crepobtot		0.0000277			
		(0.00022)			
Crepobjov1524	-0.001903***		-0.0009026	-0.0017804	-0.0020748
	(0.00058)		(0.00174)	(0.00237)	(0.00238)
Regional Conditions					
Lningcte					
Lnidh		0.0009786***			
		(0.00018)			
Lnidh2					
Lningcte2					
Cobmedalsecof			0.0013203***		
			(0.00014)		
Cobmedalsecof2					
Mortinf	-3.92e-07***	-2.98e-07***	-3.79e-07***	-4.53e-07***	-4.66e-07**
	(0.00000)	(0.00000)	(0.00000)	(0.00000)	(0.00000)
Conflict Conditions					
bdestparneo	0.0011073***				
	(0.00034)				
bdestgue	0.0008762***				
	(0.00026)				
Political Regime					
hhi	-0.0010272	-0.0005039			
	(0.00126)	(0.00044)			
ipmg			0.0002848		
			(0.00051)		
pd		0.0068098			0.0064737***
		(0.00397)			(0.00133)
ia	0.0215799***		0.0244113***	0.0259438***	0.0217176***
	(0.00416)		(0.00459)	(0.00492)	(0.00448)
rq			-0.0177325***		
			(0.00702)		
hhi2	0.0016197				
	(0.00167)				
ipmg2					
pd2		-0.2918			
		(1.1128)			
ia2					
rq2			0.0584875***		
			(0.02499)		