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Economic Development, Political Violence and Socio-Political Instability in Colombia: An Econometric Analysis Using Panel Data

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Abstract:

Socio-political instability is considered as an obstacle for economic and social development of countries. Therefore, Political violence as a feature of socio-political instability is a significant development constraint that generates economic problems, limits public and private investments, and damages the country's infrastructure.

This paper offers an explanation for political violence and economic development through an empirical analysis of Colombian departments that includes factors such as social conditions and narcotrafficking.

We use multiple datasets to measure political violence and economic development, and we employ panel fixed-effects Driscoll and Kraay regressions and Generalized Method of Moments Estimation (GMM) for a sample of Colombian departments over the period 2000-2014.

In the political violence model, we find that the aggregate-level production per capita, education, arrests and health coverage have a negative effect on political violence, whereas GINI, unemployment rate, illegal drugs and displaced population have a positive effect on violence. In the economic development model, political violence, armed actions and corruption have a negative effect on economic development, whereas population, saving, employment, political participation, manufacturing and production have a positive effect on economic development.

The findings demonstrate the importance of implementing social policies and strategies against political violence to increase economic growth and development, productivity, political participation and security for the population across Colombia's departments.

Keywords*: Economic development, socio-political instability, political violence, social conditions, Panel Data, Colombia.*

JEL Classification*: O1, 040, I30, C33.*

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1. Introduction

Recent literature suggests that a measurement of socio-political instability relate political violence as an approach (Linke, Schutte, Buhaug, 2015). Some studies have worked socio-political instability as measures of government stability, social unrest, and political violence (Butkiewicz and Yanikkaya, 2005). Several researches to have demonstrated that economic and socio-political stability are essential requirements to achieve effective economic development. Political violence is recognised as a cause of economic decline and political instability that undermines the development and social conditions of a population through its destructive effects on human, natural and physical capital in a region, Detges (2017). In several developing countries, the extreme deprivation and oppression, high levels of inequality and poor social conditions and development are triggered by irregular armed groups that have sought to achieve political power through violence (Bodea and Elbadawi, 2008; Moser and Clark, 2001).

Several studies in the last year have suggested that economic growth and development determine the opportunity cost of peace, institutional state of the country and the risk of political violence (Gøtzsche-Astrup, 2019). Moreover, the economic growth and development linked to political violence are themselves endogenous to the economic and political institutions that govern the management of the political processes and economic activities in a society (Magesan and Leong, 2018). Furthermore, these institutions are influenced by social and cultural features (Bodea and Elbadwi, 2007; Rodrik *et al.*, 2004; Sambanis, 2004).

Violence and criminal activity have been analysed using multiple approaches. From the economic theory of crime, Becker (1968) suggested that criminal acts are the result of rational decisions based on a cost-benefit analysis that includes the loot and the opportunity cost of the crime in the form of the penalties imposed to apprehend criminals. This theory predicts that a greater possibility of earning an income by legal means and an increase in law-abidingness would decrease the incentives to participate in criminal activities and would thus reduce violence. In criminology, Cohen and Felson (1979) proposed the routine activities theory, which asserts that three requirements are necessary for a crime to occur: a motivated offender, a suitable target, and the absence of capable guardians. Hence, if any of these requirements is lacking, a crime will not occur. Blau (1977) and Blau and Blau (1982) argued that heterogeneity and patterns of inequality in social relations influence the observed crime rates.

Therefore, variations in the rate of violence are the result of inequalities in the socio-economic conditions. These theories demonstrate that the causes and effects of violence are varied and depend on different processes such as economic, political and social conditions. Messner and Rosenfeld (1996), Messner and Rosenfeld (1999), Messner and Rosenfeld (2006) and Messner and Rosenfeld (2007) proposed the Institutional-Anomie Theory where crime results from the intersection of

particular cultural and structural features of a society. Therefore, a society with high levels of crime is characterised by the supremacy of the economy relative to non-economic institutions; the fundamental values of the culture emphasise an egoistic form of individualism, and the social norms fail to have much restrictive power on the choice of the means of action.

In developing countries, political violence has increased in recent decades. The main root causes include poverty, inequality and declining economic growth and state capability. Generally, violence is more severe in poorer countries with low per capita incomes and slow economic growth generate the negative effects on investment, economic development and a lack of opportunity for the population. Nafziger and Auvinen (2002) analysed various factors that affect conflict and political violence in developing countries, demonstrating that declining incomes, poor economic performance, inequality, competition for natural resources and a decaying state are the sources of conflict and political violence. Besley and Persson (2011) studied political violence with regard to institutional and economic factors. Economic shocks, political institutions and natural resources affect the levels of conflict and political violence. Blattman and Miguel (2010) examined political violence in different contexts, finding that low incomes, weak state institutions, political grievances, abundant resources and social divisions are drivers of conflict and violence, especially in less developed countries.

Political violence has been studied in various contexts using different approaches. Butkiewicz and Yanikkaya (2005) analysed socio-political instability and economic growth by applying several econometric techniques on a panel of countries over a 30-year period. Their results demonstrated that in low-income countries, political violence has significant and negative effects on economic growth, and in developing countries, preventing and/or eliminating violence is important for economic growth. Collier and Rhoner (2008) studied democracy, development and conflict using an empirical approach, indicating that the level of income in a society determines how prone it is to political violence, and in low-income countries, democracy needs to be accompanied by socio-economic policies that strengthen security. Miljkovic and Rimal (2008) analysed political instability and socio-economic factors using a panel data model, demonstrating that several socio-economic factors, including income growth rate, initial income level, and the nature of the political regime, affect political instability. Pin (2009) examined the causal impact of political instability on economic growth using a dynamic panel system, Generalised Method of Moments model, suggesting that economic growth has a causal impact on political violence. However, these studies have not analysed the relationship between political violence and economic development.

Political violence in Colombia has been analysed by several researchers. Deas (1997) showed that some at some points in Colombian history, armed conflict has had a strong political component, but in recent decades, the violence has neither been revolutionary nor political. Brauer *et al.* (2004) studied political violence using

time series and decomposition techniques and found that the cyclical component of Colombia's violence strongly coincides with the country's political events. Tate (2001) analysed political violence carried out by paramilitary groups and determined that these illegal groups are responsible for major drug trafficking operations and the majority of the political violence in Colombia. Waldman (2007) analysed political violence while accounting for cultural factors. He finds that economic factors and the socio-cultural features of Colombian society may explain political violence in this country. Moser (2000) suggested three categories of violence for the study of violence in Colombia using a method that is both conceptually and operationally integrated:

(i) Political violence comprises violent acts motivated by the wish, either conscious or unconscious, to obtain or maintain political power. This category includes guerrilla conflict, paramilitary conflict, political assassinations, and armed conflict between political parties. The proper strategy to control this category of violence involves peace negotiations.
(ii) Economic violence comprises violent acts motivated by the desire, either conscious or unconscious, for economic gain or to obtain or maintain economic power. Its manifestations are the following: street crime, carjacking, robbery or theft, narcotrafficking, kidnapping, and assaults during economic crimes. The control of this category of violence implies the design of social policies that address topics such as the labour market, social opportunities and inclusivity.
(iii) Social violence involves violent acts motivated by the wish, either conscious or unconscious, for social gain or to obtain or maintain social power. This category of violence includes interpersonal violence such as spousal and child abuse, the sexual assault of women and children, and arguments that become violent. However, studies on the relationship between political violence and economic development in Colombia are limited by their empirical approaches and the variables for political violence that they employ such as social conditions, narcotrafficking and arrests for political violence.

Therefore, the purpose of this study is to contribute a better explanation of political violence that is defined as acts that involve strong and are made by private persons or groups with two objectives:

(i) Destruction of the current political and social system with the aim to replace by another better in theory.
(ii) Destruction of the dominant political regime with the aim to replace by another. Therefore, the purposes of political violence are the following to maintain, modify, substitute or destroy of the state or society model. This type of violence involves also acts to destroy or suppress a human group with an identity within society by social, political, ethnic, racial,

religious, cultural or ideological affinity (Moser and Clark, 2001; Moser, 2000).

To analysize political violence, we apply an empirical approach using several variables of development and social conditions of population for Colombia's departments. The paper contributes to the literature by analysing political violence and economic development using a sample from a developing country (Colombia), which is characterised by a stable democratic government and little racial or religious conflict. However, this country has experienced armed conflict for decades, which has generated high rates of violence. Political violence in Colombia is committed by a variety of irregular armed actors, as a result of a dangerous combination of narcotrafficking, guerrillas and paramilitary forces that operate in the name of social justice and democracy but seek only economic power (Sweig, 2002). Moreover, unlike previous studies, the model applied in this study includes social conditions, arrests and drug trade variables to determine the relationship between political violence and economic development using an empirical approach.

2. Data and methodology

2.1 Data

This paper uses Colombia as a case study. Colombia has 32 sub-national political territories called departments. We use data published by the National Police of Colombia, the Colombian defence ministry, the DNP (National Planning Department), the Colombian Treasury Ministry, the DANE (Colombian Department of Statistics), the National Institute of Legal Medicine and Forensic Sciences, Conflict Analysis Resource Center (CERAC), the database of lethal political violence from IEPRI (Institute of Political Studies and International Relations), CINEP (Centre of Research and Popular Education), the Office of the Attorney General of Colombia, the Office of the Inspector General of Colombia, the Office of the Controller General of the Republic of Colombia, the National Civil Registry, and the Illicit Crop Monitoring System in Colombia (SIMCI) of the United Nations Office on Drugs and Crime. We construct panel data at the Colombian department level to analyse political violence. The analysis is performed for the period 2000-2014.

2.2 Methodology

The models proposed in this paper to analyse political violence and economic development are as follows: The model for political violence in equation 1:

$$PV_{it} = a_i + \beta_1 PO_{it} - \beta_2 GDPpc_{it} - \beta_3 EDU_{it} - \beta_4 BE_{it} + \beta_5 ID_{it} + \beta_6 GINI_{it} + \beta_7 LM_{it} + \beta_8 DP_{it} - \beta_9 HC_{it} - \beta_{10} CAP_{it} + \mu_{it} \quad (1)$$

where PV represents political violence; PO is the population of a department; GDPpc is the aggregate-level production per capita by department; EDU represents education variables such as primary and secondary education coverage by department; BE is the budget execution by department; ID represents variables pertaining to illegal drugs, such as hectares under drug cultivation by department; GINI is a measure of income inequality by department; LM represents the relevant characteristics of the labour market, such as the unemployment rate; DP is the displaced population in a department; HC represents health coverage; and CAP is the number of arrests or apprehensions for each Colombian department i in period t.

The sign before a variable signals its expected effect on political violence. Such a formulation is in line with the general economic literature on violence (e.g., Becker (1968), Durkheim (1982), Fajnzylber et al. (2002), Besley and Persson (2011), OECD (2009)). The hypotheses tested in this model are as follows: departments with higher populations, hectares under drug cultivation, inequality, unemployment rates and displaced populations increase political violence, whereas departments with higher levels of GDPpc, education, budget execution, health coverage and arrests decrease political violence. The model for economic development in equation 2:

$$GDPpc_{it} = a_i - \psi_1 PV_{it} + \psi_2 PO_{it} + \psi_3 SAV_{it} + \psi_4 MP_{it} + \psi_5 CP_{it} + \psi_6 ER_{it} + \psi_7 PP_{it} - \psi_8 ARC_{it} - \psi_9 CO_{it} + \mu_{it} \quad (2)$$

where GDPpc is the aggregate-level production per capita by department; PV represents political violence; PO is the population of a department, SAV represents saving by department; MP is manufacturing production by department; CP represents construction production by department; ER represents the relevant characteristics of the labour market such as the employment rate; PP is political participation by department; ARC are armed actions perpetrated by illegal armed groups of a department; and CO is a measure of corruption for each Colombian department i in period t. The sign before a variable signals its expected effect on economic development, according to literature on this topic (Collier *et al.*, 2003; Solimano, 2004; Bodea and Elbadwi, 2007; Banerjee *et al.*, 2011). The hypotheses tested in this model are as follows: departments with higher political violence, armed actions and corruption will show lower economic development, whereas departments with higher populations, saving, manufacturing and construction production, employment rates and political participation will show higher economic development.

To examine political violence and economic development and their relationships with social conditions and narcotrafficking, we employ a panel data model with department-specific fixed effects with the aim of capturing all of the characteristics specific to each department (e.g., the level of development or economic growth). This type of model is used because it is capable of accounting for the effects of unobserved elements (Green, 2011; Wooldridge, 2010; Baltagi, 2008; Arellano,

2003; Cameron and Trivedi, 2005; Hsiao, 2003). Unobserved elements are variables that characterise the particular units or individuals in an analysis that cannot be measured and therefore cannot be included in the regression model. Moreover, a fixed-effects model helps solve the correlation problem because it can control for various unobservable influences on political violence and economic development across departments and over time (Däubler, 2006; Hanchane and Mostafa, 2010). Furthermore, to control for department-specific and time-invariant unobservable influences on the Colombian departments, a time fixed effects test indicates that no time fixed effects are needed, whereas an entities fixed effects test indicates that entities fixed effects are required.

Equations (1) and (2) show the basic framework of a model that accounts for unobserved elements, where a_i are individual or heterogeneous effects and μ_{it} are disturbance terms. In the models proposed in this study, the heterogeneous or unobserved effects of the units are particular and intrinsic factors of each department that affect social, economic and political conditions.

3. Results

This section provides the estimates from the basic fixed-effects model and the fixed effects model using Driscoll and Kraay standard errors. This model was used to correct the heteroskedasticity problem and the cross-sectional dependence found in the models in the Wald and Wooldridge tests. However, the results of the two estimations present the same coefficients and trends in political violence and economic development as well as their relationships with social conditions, narcotrafficking and arrests. The results suggest that political violence and economic development depend on various factors. First, population, inequality, the unemployment rate and displaced population have a positive effect on political violence, whereas GDPpc, education and arrests have a negative effect on political violence. Second, population, department saving and employment rate have a positive relationship with economic development, whereas political violence and armed actions have a negative relationship with economic development (see tables 1 and 2). These results confirm the hypotheses suggested in this study on the trends of political violence and economic development in Colombian departments.

The tests performed on the estimated residuals from the fixed-effects models show heteroskedasticity and Cross-Sectional Dependence problems. To correct these problems, the model is estimated again using Driscoll and Kraay (1998) standard errors and implemented by Hoechle (2007). This estimation accounts for heteroskedasticity and Cross-Sectional Dependence problems. Moreover, this option allows for the correction of any degree of auto-correlation. Tables 1 and 2 show the corrected estimation results using fixed effects with Driscoll and Kraay standard errors.

i. Economic development: In this model, economic development is measured by GDP per capita. The results show that political violence, armed actions and corruption undermine economic development, whereas higher population, saving, employment rate, political participation, and manufacturing and construction production encourage economic development. Table 1 presents the results of the model. These results confirm our proposed hypothesis and concur with the results of Bechetti *et al.* (2011), who demonstrated that political violence, corruption and low social capital production have negative consequences for economic development.

Political violence and armed actions have negative and significant effects on economic development. Departments with higher political violence and armed actions have lower economic development. An unproductive economy, political deterioration and the presence of political violence interact in several ways: economic and political factors contribute to violence, while violence has an adverse effect on economic growth and political development (Nafziger and Auvinen, 2002). Moreover, Geneva Declaration on Armed Violence and Development recognised that armed violence and conflict impede the realisation of the Millennium Development Goals. Conflict prevention and resolution, reduced violence, respect for human rights, good government performance and peace-building are crucial steps towards reducing poverty, promoting economic growth and development and improving the welfare of the population. Therefore, states should make the reduction of armed violence a priority in their national development plans. They should ensure full compliance with existing and emerging norms and agreements to reduce and prevent violence, seek resolutions to conflicts, and enhance peace-building efforts to increase economic growth and development and the welfare of the population (UNDP, 2006).

Population has a positive and significant effect on economic development. Several studies have demonstrated that population growth is likely to exert a positive net impact on economic development in many third world countries because it creates a large potential labour force (Simon, 1981).

Saving has a positive effect on economic development. Departments with higher saving have higher economic development. Several economists have demonstrated that a higher savings rate leads to higher economic growth and development because high savings leads to increased investment through a more efficient allocation of resources. In turn, this efficient allocation helps to improve the standard of living because the population has more job opportunities and greater prosperity, which translates to higher economic development (Robinson, 1933; 1962; 1967; Sen, 1961; Kaldor, 1954; Kaldor and Mirrless, 1962).

Manufacturing and construction production have a positive relationship with economic development. Manufacturing and construction play an important role in the attainment of sustained economic growth and development because these activities contribute to economic activity through construction in new or revitalised

cities and towns, improvements in infrastructure, higher production and business opportunities, a stable labour market and increased welfare for the population (Kelley and Harrison, 1990; Guisan, 2008).

The employment rate has a positive effect on economic development. Economic growth is a fundamental requirement for the development of a country, and this growth is accomplished by people. Therefore, a labour market must create an efficient economy and increase competitiveness and sustainable employment with the aim of achieving full and productive employment for the population, which is a key factor in the creation of economic growth and development.

Political participation is positively related to increased economic development. Several studies have demonstrated that economic development leads to higher levels of citizen participation because economic development leads to clusters of social changes that will drastically alter the class, organisational, cultural, and social structures of a nation, and these changes are associated with new forms of political participation (Nie *et al.*, 1969; Muller, 1997; Shi, 2004; Feng *et al.*, 2011).

Corruption has a negative effect on economic development, Sierra and Vargas (2015). Corruption is a problem that affects the social, political and economic processes in a society (Cotte and Lancheros, 2015). Economic development is affected by this phenomenon, mainly due to the decline in foreign direct investment resulting from higher transaction costs and motivated by multifarious bureaucratic processes for soliciting bribes (Podobnik *et al.*, 2008; UNODC, 2011; Banerjee *et al.*, 2011).

Table 1. *Fixed effects regression with Driscoll and Kraay standard errors estimations of GDP per capita*

Parameter	[1]		[2]		[3]		[4]		[5]		[6]	
	Fixed Effects	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**
Constant	1.470 [a] (0.36)	1.470 [a] (0.44)	1.483 [a] (0.36)	1.483 [a] (0.47)	1.325 [a] (0.36)	1.325 [b] (0.57)	1.363 [a] (0.39)	1.363 [b] (0.55)	1.466 [a] (0.41)	1.466 [b] (0.64)	1.012 [b] (0.47)	1.012 (1.21)
Political violence	-0.037 [a] (0.00)	-0.037 [a] (0.01)	-0.034 [a] (0.00)	-0.034 [a] (0.00)	-0.036 [a] (0.00)	-0.036 [a] (0.01)	-0.036 [a] (0.00)	-0.036 [a] (0.00)	-0.033 [a] (0.00)	-0.033 [a] (0.01)	-0.024 [b] (0.01)	-0.024 [c] (0.01)
Population	0.854 [a] (0.02)	0.854 [a] (0.03)	0.845 [a] (0.02)	0.845 [a] (0.04)	0.854 [a] (0.02)	0.854 [a] (0.04)	0.855 [a] (0.02)	0.855 [a] (0.04)	0.852 [a] (0.02)	0.852 [a] (0.04)	0.798 [a] (0.02)	0.798 [a] (0.05)
Saving	0.041 [a] (0.01)	0.041 (0.02)	0.043 [a] (0.01)	0.043 [c] (0.02)	0.022 (0.01)	0.022 (0.03)	0.021 (0.01)	0.021 (0.03)	0.016 (0.01)	0.016 (0.03)	0.121 [a] (0.02)	0.121 [c] (0.02)
Manufacturing production	0.033 (0.03)	0.033 (0.02)	0.030 (0.03)	0.030 (0.02)	0.039 (0.03)	0.039 (0.02)	0.037 (0.03)	0.037 (0.02)	0.035 (0.03)	0.035 (0.02)	0.035 (0.03)	0.035 (0.02)
Construction production			0.042 [c] (0.02)	0.042 (0.02)	0.043 [c] (0.02)	0.043 [c] (0.02)	0.042 (0.02)	0.042 (0.02)	0.042 (0.02)	0.042 (0.02)	0.071 [c] (0.04)	0.071 (0.06)
Employment rate					0.051 (0.03)	0.051 (0.03)	0.051 (0.03)	0.051 (0.03)	0.054 [c] (0.03)	0.054 [c] (0.03)		

Political Participation							0.022 (0.08)	0.022 (0.07)	0.010 (0.08)	0.010 (0.06)		
Armed actions									-0.011 (0.01)	-0.011 (0.00)	-0.035 [b] (0.01)	-0.035 [a] (0.01)
Corruption											-0.016 (0.01)	-0.016 (0.01)
F model	306.57 0.00	234.18 0.00	247.32 0.00	198.73 0.00	207.02 0.00	189.08 0.00	176.90 0.00	208.87 0.00	152.75 0.00	180.86 0.00	173.61 0.00	173.61 0.00
F-test for OLS vs. FE	**F(22, 105) = 357.61 (Reject OLS)**											
Hausman test*	82.89 0.00		79.06 0.00		83.02 0.00		79.39 0.00		97.50 0.00		53.17 0.00	
Wald test	3575.49 0.00		3765.66 0.00		5359.31 0.00		5779.95 0.00		6924.75 0.00		1370.11 0.00	
Wooldridge test	83.19 0.00		81.16 0.00		78.26 0.00		85.87 0.00		84.78 0.00		162.73 0.00	
No. Obs	325	325	325	325	324	324	324	324	320	320	135	135

Note: *Figures in the parentheses are standard errors.* [a] *Significant at the 1% level,* [b] *Significant at the 5% level,* [c] *Significant at the 10% level.* [*]*If Prob>chi2 is < 0.05 reject random effects.*

ii. Political violence: Table 2 shows the results for political violence. The results show that arrests, education, budget execution, and GDPpc have negative effects on political violence. Population, GINI, the unemployment rate and illegal drug cultivation have positive effects on political violence (Table 2). These results concur with those obtained by Solimano (2004), who discuss the state's monopoly on coercion and force and find political violence to be associated with the state's failure to maintain control.

The variables of economic growth and development, GDPpc and budget execution have negative and significant effects on political violence, whereas the GINI index has a positive and significant effect. This finding implies that increases in economic growth and development are linked with decreases in political violence, but that departments with high levels of income inequality exhibit comparatively high political violence (Messner et al. (2002). In previous studies, high levels of political violence have been shown to cause recessions, impose financial constraints on the government, and damage the country's infrastructure (Li (2006)). Such findings agree with our results for the Colombian case.

Table 2. *Generalized Method of Moments (GMM), fixed effects regression with Driscoll and Kraay standard errors estimations of political violence*

	[1]		[2]		[3]		[4]		[5]		[6]		[7]		[8]
Parameter	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Fixed Effects**	**FE Driscoll and Kraay**	**Generalized Method of Moment (GMM)**
Constant	-1.627 (2.29)	-1.627 (1.71)	-1.612 (2.29)	-1.612 (1.72)	9.452 [a] (2.95)	9.452 [a] (1.45)	9.125 [b] (3.65)	9.125 [a] (1.69)	1.166 (3.91)	1.166 (3.52)	2.711 (4.11)	2.711 (2.59)	1.530 (4.10)	1.530 (2.97)	-1.963 (4.12)
Population	0.937 [a] (0.35)	0.937 [a] (0.21)	0.944 [a] (0.36)	0.944 [a] (0.21)	0.596 [c] (0.34)	0.596 [a] (0.16)	2.256 [a] (0.59)	2.256 [a] (0.55)	2.209 [a] (0.56)	2.209 [a] (0.56)	2.067 [a] (0.58)	2.067 [a] (0.51)	2.282 [a] (0.57)	2.282 [a] (0.50)	2.713 [a] (0.81)

GDP per capita	-0.609 (0.37)	-0.609[b] (0.25)	-0.618[c] (0.37)	-0.618[b] (0.26)	-0.396 (0.35)	-0.396[c] (0.20)	-2.191[a] (0.65)	-2.191[a] (0.59)	-2,112[a] (0.62)	-2,112[a] (0.53)	-1.917[a] (0.64)	-1.917[a] (0.55)	-1.822[a] (0.64)	-1.822[a] (0.55)	-2.583[b] (1.03)
Primary education coverage	-0.003 (0.02)	-0.003 (0.03)	-0.005 (0.02)	-0.005 (0.03)	-0.032 (0.02)	-0.032[c] (0.01)	-0.042[c] (0.02)	-0.042 (0.02)	-0.062[b] (0.02)	-0.062[a] (0.02)	-0.060[b] (0.02)	-0.060[a] (0.02)	-0.065[a] (0.02)	-0.065[b] (0.02)	-0.002 (0.03)
Budget execution	-0.189[b] (0.09)	-0.189[a] (0.04)	-0.193[b] (0.09)	-0.193[a] (0.04)	-0.097 (0.09)	-0.097[c] (0.05)	-0.193 (0.13)	-0.193[b] (0.09)	-0.148 (0.13)	-0.148 (0.09)	-0.151 (0.12)	-0.151 (0.09)	-0.180 (0.12)	-0.180[c] (0.09)	-0.147 (0.14)
Hectares under drug cultivation	0.087 (0.06)	0.087 (0.08)	0.094 (0.06)	0.094 (0.08)	0.038 (0.05)	0.038 (0.04)	0.028 (0.64)	0.028 (0.03)	0.016 (0.06)	0.016 (0.03)	0.016 (0.61)	0.016 (0.03)	0.053 (0.06)	0.053[c] (0.03)	0.133[c] (0.07)
Secondary education coverage			-0.032 (0.06)	-0.032 (0.04)	-0.088 (0.05)	-0.088[b] (0.03)	-0.111[c] (0.05)	-0.111[a] (0.03)	-0.155[a] (0.05)	-0.155[a] (0.03)	-0.150[a] (0.05)	-0.150[a] (0.03)	-0.155[a] (0.05)	-0.155[a] (0.03)	-0.06 (0.03)
GINI					13.79[a] (2.49)	13.79[a] (2.39)	12.91[a] (3.66)	12.91[a] (3.02)	6.892[c] (3.74)	6.892[c] (4.11)	10.00[b] (4.58)	10.00[a] (2.04)	11.95[a] (4.60)	11.95[a] (2.02)	2.80 (5.82)
Unemployment rate							0.456[c] (0.25)	0.456[c] (0.24)	0.389[c] (0.23)	0.389 (0.25)	0.406[c] (0.24)	0.406[c] (0.23)	0.426[c] (0.23)	0.426[b] (0.20)	0.217 (0.23)
Displaced population									0.488[a] (0.10)	0.488[a] (0.16)	0.486[a] (0.11)	0.486[a] (0.15)	0.478[a] (0.10)	0.478[a] (0.16)	0.450[a] (0.10)
Health coverage											-0.135 (0.11)	-0.135 (0.15)	-0.038 (0.12)	-0.038 (0.09)	-0.304[c] (0.16)
Arrests													-0.323[b] (0.13)	-0.323[b] (0.15)	-0.201[b] (0.09)
Political violence lagged one period															0.263[a] (0.10)
F model	2.45 0.03	36.08 0.00	2.09 0.05	33.54 0.00	6.39 0.00	37.49 0.00	6.89 0.00	25.93 0.00	8.97 0.00	76.28 0.00	8.23 0.00	86.77 0.00	8.16 0.00	56.83 0.00	**Sargan test** 0.424
F-test for OLS vs. FE	**F(21, 195) = 3.96 (Reject OLS)**														Serial Correlation:
Hausman test*	27.70 0.00		27.01 0.00		48.43 0.00		58.38 0.00		50.16 0.00		50.35 0.00		48.35 0.00		Firs-order: 0.0029
Wald test	273.71 0.00		276.85 0.00		7.7e+28 0.00		400.03 0.00		429.18 0.00		2.2e+31 0.00		284.56 0.00		Second-order: 0.4069
Wooldridge test	8,850 0.00		8.96 0.00		5.824 0.02		4.713 0.04		4.21 0.05		3.949 0.06		3.523 0.07		
No. Obs	284	284	284	284	284	284	228	228	228	228	228	228	228	228	228

Note: *Figures in the parentheses are standard errors.* [a] *Significant at the 1% level,* [b] *Significant at the 5% level,* [c] *Significant at the 10% level. *If Prob>chi2 is < 0.05 reject random effects.*

The results for population size show a positive correlation with political violence. This positive correlation may occur because departments with heterogeneous populations have weak social ties, poverty and high population turnover, making them more conducive to political violence. This explanation is applied by McCall and Nieuwbeerta (2007) to European countries and Schichor *et al.* (1979) to the U.S.

The results for the number of arrests indicate the importance of the presence of the state in reducing political violence. Moreover, political violence reduces social investments that alter the development and economic growth of departments, decreasing the quality of life and generating more political violence, which concurs with the conclusions of Nafziger *et al.* (2000).

Illegal drugs, measured as hectares under drug cultivation, have a positive influence on political violence that is a result of increased cultivation of coca or other illegal drugs (Angrist and Kugler, 2007; Hofmann, 2009). Moreover, in Colombia, narcotics traffickers have generated a new set of values for Colombian society. This

process is evinced by the consumerism and loss of institutional legitimacy that were reflected in the general lack of state authority suffered in this country in the mid-1980s and late 1990s. This crisis progressively destroyed any chance of institutional intervention because the drug traffickers are opposed to institutional loyalties of any kind and demonstrate that anyone can reach power through the use of violence (Camacho and Lopez, 2000).

Displaced population has a positive and significant effect on political violence. In Colombia, illegal armed groups and their actions against civilians are the primary cause of forced displacement that generates higher poverty and inequality, losses in welfare conditions, and limited employment opportunities among the displaced population. These factors may encourage violence in these vulnerable populations (Ibañez and Velez, 2008; Ibañez and Moya, 2010).

Health coverage has a negative effect on political violence, indicating that higher rates of health coverage decrease political violence. Hunt (2008) demonstrated that political violence has become a key health issue because political violence causes increased morbidity and mortality in a population, has significant and long-lasting negative health effects on the people and disrupts the provision of adequate health services. Political violence seems to persist over time; as soon as some conflicts are resolved, new violence erupts elsewhere.

Education, measured as primary and secondary education coverage, shows that an increase in education coverage significantly reduces subsequent political violence, yielding sizeable social benefits because education should have a significant and sizable influence on individual propensities to commit violent acts (Machin and Vujic, 2006). According to Lochner (2007), there are four primary reasons that education might affect violence:

(i) education increases wage rates, which increase the opportunity costs of violence;
(ii) education may directly affect the financial rewards of crime;
(iii) education may alter preferences for risk-taking or patience;
(iv) education may affect the social networks or peers of individuals.

The unemployment rate has a positive and significant effect on political violence, indicating that higher unemployment rates generate increased political violence. Unemployment can be a significant feature of the processes leading to violent conflict because this situation aggravates the existing stress of idle workers, who might suffer from unmet economic expectations, causing them to turn to political violence (Piazza, 2006; Cramer, 2010).

These results demonstrate that political violence is closely related to social conditions, arrests and economic growth and development. Improved social conditions are created by a strong state. Political violence tends to correlate with negative variables such as a weak state presence and a lack of effective justice,

which concurs with the Colombian case (Chernick and Bailey, 2005). According to World Bank (2007), in the context of Latin America, economic growth and development are impeded by high levels of violence and insufficient opportunity. Therefore, violence increases when the application of justice is weak, economic opportunity is scarce, and education and labour market are deficient.

4. Conclusions

In this paper, we attempt to explain and analyse political violence and economic development and their relationships with the social conditions and the political violence using fixed effects on panel data from Colombian departments between 2000 and 2014. To examine political violence and economic development, we employ a panel data model with department-specific fixed effects and fixed effects with Driscoll and Kraay standard errors to capture all of the characteristics particular to each department (e.g., the levels of development or political violence).

In the political violence model, we find that aggregate-level production per capita, education, arrests and health coverage have a negative effect on political violence Conversely, GINI, illegal drugs, population, the unemployment rate, and displaced population have a positive effect on political violence. Moreover, social conditions and narcotrafficking are important factors influencing the trends of political violence in the Colombian departments.

In the economic development model, we find that political violence, armed actions and corruption have a negative relationship with economic development, whereas population, saving, employment rate, political participation, manufacturing and construction have positive effects on economic development. These results indicate that increases in economic development are associated with decreases in political violence and that departments with higher armed actions and corruption exhibit comparatively lower economic development.

The results demonstrate that political violence is closely related to social conditions and economic development. These features are determined by state presence, and political violence tends to correlate with negative variables such as a weak state presence and a lack of effective justice. Economic development is impeded by high levels of political violence and insufficient opportunities. Therefore, political violence increases when the application of justice is weak, economic opportunity and political participation are scarce, and education and healthcare are deficient.

The findings demonstrate the importance of implementing social policies and strategies to decrease political violence and increase economic growth and development, productivity, and security for the population across the Colombian departments. These policies and strategies ought to include investments in education and increased opportunities in the labour market, and for political participation, these should include strengthening the justice system, Morales and Finke (2015),

decreasing corruption and generating an effective state presence in all of Colombia's regions.

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