

# Education, Inequality and Violent Crime in Minas Gerais.

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## Abstract

This paper studies the influence of education and relative deprivation on violent crime in the context of a developing country. It proposes an econometric estimation of the determinants of violence for 723 municipalities of Minas Gerais, one of the 26 Brazilian states. Education has a significant reducing effect upon interpersonal crime while violent property crime is mainly influenced by inequality.

Keywords: violent crime, deprivation, education, Minas Gerais.  
JEL codes: D63, I21, K42, O54

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## 1 Introduction

In 2001, Brazil experienced homicide rate of 23 per 100,000 inhabitants and robbery rate of 395 per 100,000 inhabitants (Ministério da Justiça 2002). These rates are very high compared to neighbor countries (respectively 8 and 135 for Argentina, 8 and 279 for Uruguay in 2001), to Western Europe (respectively 4 and 229 for France, 3 and 69 for Germany) and even to the United States (respectively 5.5 and 148.5)<sup>1</sup>. As a consequence, safety has become one of the main public and private concern in Brazil and Latin America over the past 20 years (Bourguignon 1999, Pradhan and Ravallion 2003).

Determinants of crime have raised interest of social scientists, and particularly of economists and sociologists. Economists rely hugely upon the theoretical framework of individual behavior developed by Becker (1968) and Ehrlich (1973), considering criminals as “normal” individuals, responding to incentives and trying to maximise their expected utility following a trade-off between legal market activities and the illegal sector. Sociological theory, in the wake of Merton (1997), considers for its part crime and violence as a deviant behavior coming from the inadequacy between individual and society. An extension of this theory is to consider crime as a response to relative deprivation, like Kawachi et al. (1999). Surprisingly, there are few recent works trying to relate education to crime, the most significant being that of Usher (1997), who studies the deterrent impact of education’s “civic externality” upon crime at a theoretical level.

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<sup>1</sup>Interpol (2002), [www.interpol.int](http://www.interpol.int)

The goal of this paper is to study how education is linked to crime, both at theoretical and empirical level, in the context of a developing country. It presents an econometric estimate of the model for 723 municipalities of Minas Gerais, one of the 26 Brazilian states.

Section 2 of this paper presents the theoretical framework, founded on a Beckerian setting, and discusses the impact of education on violence. Section 3 presents the data. Crime rates are recorded in a newly used database, which provides data at the municipal level for Minas Gerais, one the 26 Brazilian states, located in the Southeastern region (municipality is the smallest administrative unit in Brazil). Our database is a cross-section of 723 municipalities of Minas Gerais for the year 2000. Though crime data come from police records, which are well-known to undermine “true” crime levels, this database is, to our knowledge, the one that provides the best data concerning Brazil and the only one of that kind for this country. Indeed, the choice of Minas Gerais has been conditioned by the existence and availability of this database. Section 4 presents the main results of econometric estimates of violent crime rates against property and against persons, with a special look at the impact of education variables. The main finding of this paper is that primary schooling reduces significantly violence. However, violent economic crime is not influenced by education but rather by income inequality. Section 5 concludes and raises some policy implications.

## 2 Theoretical background

### 2.1 The framework of crime economics

According to the economic theory of crime, initiated by Becker (1968) and Ehrlich (1973), criminals are like other individuals, seeking to maximise their expected utility and responding to incentives. Crime is seen as the outcome of a rational choice of time allocation between legal and illegal activities. Hence, each agent compares his expected earnings in legal and illegal sector, criminals being those for whom the former is less than the latter. This choice is expected to be largely influenced by deterrence, that is by the probability of apprehension and the size of punishment: the more the deterrence, the less the number of crimes and criminals. Following economic theory, property crime is also induced by income inequality, since it is seen by the poorest individuals as a way to increase their income (Bourguignon 1999). However, this point of view is somewhat restrictive since it gives no explanation to violent crime such as homicide, assault or rape, which are committed without any economic incentive.

### 2.2 Introducing deprivation in crime models

#### 2.2.1 What is relative deprivation?

Relative deprivation is a sociological concept, more and more used by economists, mainly to explain migration. Yitzhaki (1979) defines relative deprivation as follows:

“We can roughly say that [a person] is relatively deprived of  $X$

when (i) he does not have  $X$ , (ii) he sees some other person or persons, which may include himself at some previous or expected time, as having  $X$  (whether or not this is or will be in fact the case), (iii) he wants  $X$ , and (iv) he sees it as feasible that he should have  $X$ .”

There are two components in the concept; not having  $X$  and wanting it cause deprivation, while conditions (ii) and (iv) ensure relativity. Poverty and/or low education cause absolute deprivation, while income inequality (and maybe education inequality) involves relative deprivation. The response to relative deprivation is the willingness to improve one’s own position relative to that of other people. Stark (1991) sees rural-to-urban migration as a response to relative deprivation, higher wages in urban sector inciting rural people to migrate, in order, not to increase income *per se*, but to get a higher social position. It is possible and rather easy to adapt this setting to the crime decision.

### **2.2.2 Linking crime to relative deprivation**

The sociological theory of crime, largely influenced by Merton (1997), far from considering crime as an individual choice, gives a social explanation. All individuals in a society are assumed to share common values, particularly common goals and common “legitimate” ways to reach these goals. Following Merton (1997), crime is a way for individuals to “adapt” themselves to the society in the sense that individuals who commit a crime follow the same goals as the whole society but differ in their respect of rules and

norms. Moreover, giving too much importance to the goals can make individuals ignoring totally the means (and their legitimacy) and lead society to a situation of *anomie* (absence of norms). In such a situation, individuals who failed to reach social goals (which, for Merton, is individual success in a competitive society) are frustrated, all the more when they face successful people, and get alienated from society. Crime, especially violent crime, is no more than a response to individual alienation. More recently, several works in social sciences (Kennedy et al. 1998, Kawachi et al. 1999) have developed models linking violence to relative deprivation.

In this paper, we stay in a Beckerian setting and just add a relative deprivation component. The traditional economic modeling of crime can be considered as incomplete in the sense that individuals do not only compare expected earnings in the legal sector and expected returns from illegal activities, they also compare their own income to that of other people, especially people around them. The setting developed in this paper makes clearer the expected effect of some key variables on crime. First, we can consider the traditional economic setting of crime (comparison between legal and illegal income) as a modeling of the effect of absolute deprivation on crime : poverty and low education induce individuals to commit crimes, both because the expected legal income and the psychological cost of punishment are small. Second, we shall add the interpersonal income comparison element. From this point of view, income inequality is a (even **the**) key variable. More generally, relative deprivation can come from other variables than income. Education inequality, or social gap between literate and illiterate people, are also probably part of the issue.

### 2.3 Discussing the role of education

Education can act on crime through several channels. First, it has an effect on violent crime through the accumulation of human capital, as it is formalized by Lochner (2004). Individuals accumulate human capital, then become more productive and get a higher wage thanks to education. Indeed, one's propensity to commit a crime should be smaller. However, the influence of education on crime through the level of income is twofold. On the first hand, education increases the expected legal income (particularly wages), which leads to an increase of the opportunity cost of crime. But on the other hand, following Lochner and Moretti (2004), this effect cannot be denied only under the hypothesis that education does not raise the returns to crime. If it is assumed that "skilled" criminals are more efficient than the unskilled ones, as it is the case on the market for legal jobs, education can be pro-crime. The total effect is thus undefined and actually depends on the relative skill-intensiveness of legal and illegal activities.

In a different approach, Usher (1997) considers the "civic externality" of education to explain its crime-reducing effect. Following this author, education "produces" good citizens, contributes to the creation of common values among individuals and is thus a deterrent to crime. More precisely, Usher develops a theoretical model with two agents, farmers (who produce grain) and bandits (who steal grain). Education involves an immediate drop in consumption but increases wages. Moreover, the propensity to banditry of each agent is a decreasing function of education. This assumption constitutes the source of the civic externality, since the propensity to banditry is defined

as the difference between the income received while being a bandit and the income one would accept to become a farmer. In this model, education has thus no effect on opportunities but only on the propensity to crime.

## 2.4 A descriptive model of crime

Let us consider the expected net benefit from crime for individual  $i$ ,  $B_i$ . An individual decides to commit a crime as long as  $B_i$  is positive. Following Fajnzylber et al. (2002), this expected net benefit depends on gains (namely loots,  $l_i$ ) and costs of crime, composed of a direct cost,  $c_i$ , a cost from deterrence (the probability of apprehension,  $p_i$  and the size of punishment,  $f_i$ ) and two immaterial costs, the legal wage the criminal would have earned had he work instead of committing a crime ( $w_i$ ) and the moral cost of crime ( $m_i$ ). One also has to consider the effect of relative deprivation, measured by the gap between one's own income and the average level of income ( $\bar{w} - w_i$ ), as well as the influence of education ( $e_i$ ). One has to keep in mind that education has an overall undetermined effect and that it also has indirect effects through the other variables, particularly the level of income,  $w_i$ , and the moral stance,  $m_i$ .

$$\begin{aligned}
 B_i &= B(p_i, f_i, l_i, c_i, w_i, m_i, \bar{w} - w_i, e_i) \\
 \frac{\partial B}{\partial p_i}, \frac{\partial B}{\partial f_i}, \frac{\partial B}{\partial m_i}, \frac{\partial B}{\partial w_i}, \frac{\partial B}{\partial c_i} &< 0 \\
 \frac{\partial B}{\partial l_i}, \frac{\partial B}{\partial (\bar{w} - w_i)} &> 0 \\
 \frac{\partial B}{\partial e_i} &=?
 \end{aligned} \tag{1}$$

### 3 The data

This paper focuses on crime issues in municipalities of Minas Gerais, one of the 26 Brazilian states, located in the Southeastern region, the wealthiest but also the most violent of Brazil. However, Minas Gerais has crime rates smaller than its neighbors states since a significant part of the state is still rural and involved in agriculture and mining activities.

#### 3.1 Measuring crime

Crime data used in this paper are issued from a database constructed by the *Fundação João Pinheiro* and the *Universidade Federal de Minas Gerais* from police data. It contains, for the 723 municipalities of Minas Gerais<sup>2</sup>, the number of occurrences and the gross crime rate per 100,000 inhabitants, for several violent crimes separately and for aggregated violent crimes against persons and against property. This paper uses a cross-section of these 723 municipalities for the year 2000 only, because of the limitation of economic and social data at the municipal level. Violent economic crime is measured by an aggregated violent crime rate against property, which is the sum of robbery, armed robbery and car-stealing. Similarly, interpersonal crime is measured by an aggregated violent crime rate against persons, which is the sum of homicide, tentative of homicide and assault. Finally, an aggregated variable of violent crime is used, which is just the sum of the preceding variables.

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<sup>2</sup>Minas Gerais now has 853 municipalities but the database was constructed when there were only 723, thus number of offenses and population for the newly created municipalities are added to the municipality they formerly belong to.

This database has the advantage to give data as disaggregated as possible, municipality being the smallest administrative unit in Brazil. Moreover, Minas Gerais is the state with the largest number of municipalities over Brazil, a sign of the willingness of decentralization of this state. Finally, it is considered, by both Brazilian government and the World Bank that “the municipal level is one of the most effective entry point for crime and violence prevention” (World Bank 2003). As a consequence, the new *Plano Nacional da Segurança Pública* (National Plan for Public Safety) puts municipalities in charge of the public safety policy. Moreover, this database has the advantage to be newly used in economics. To the best of our knowledge, Beato and Reis (2000) are the only authors who already used it<sup>3</sup>.

### 3.2 Explanatory variables

The sample is a cross-section of 723 municipalities of Minas Gerais for the year 2000, which was a census year in Brazil and for which the best economic and social data are available at the municipal level. During the census, over 25 per cent of households are covered by a detailed survey, both at household level (about 460,000 households for Minas Gerais in 2000) and individual level (about 2,000,000 people). Household questionnaire deals with conditions of living and housing while individuals are questioned about their personal characteristics, such as income, education, migration, job, and so forth. The survey contains household and individual weights, constructed in

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<sup>3</sup>However, Beato and Reis used data for the year 1991, which was the year of the preceding census. However, our database uses police data, which are well-known to undermine actual crime rates since it records only reported crime. As a consequence, results of this paper should be considered with caution.

order to extend results to the whole population. Most of the variables used here were constructed by aggregating weighted observations for each municipality, and then dividing by the municipality's population to get averages. Some other variables come from the Atlas of Human Development in Brazil, constructed by UNDP on the basis of the 1991 and the 2000 censuses.

Several education variables are introduced alternatively. The first one is the average years of schooling, which is the main measure of the "output" of the educational system. In order to isolate a possible correlation between basic education only and violence, the literacy rate is introduced in the second set of estimations. Then, the shares of the adult population with respectively primary, secondary and tertiary education are introduced in order to emphasise the impact of the several components of education upon violent crime. Finally, an educational Gini index is introduced in order to explore the effect of educational inequality on crime. This index was built by the author, following the methodology proposed by Thomas et al. (2000).

Economic and sociological theories of crime both suggest income inequality to be crime-enhancing. The Gini coefficient of income, which measures inequality within each municipality (but not between) is introduced and expected to have a positive impact on crime rates<sup>4</sup>. The average municipal income is introduced as a measure of development. However, since this variable is likely to be endogenous, the lagged value (that is average income of 1991) is introduced directly in place of the current value.

One must finally control for several stylised facts concerning crime and

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<sup>4</sup>Yitzhaki (1979) shows the link between relative deprivation and the Gini coefficient of income.

demographic and social conditions. Crime rates are well-known to be higher in urban and high-population-density areas. For Glaeser and Sacerdote (1999), cities offer higher expected gains and smaller probabilities of apprehension and recognition for criminals. As such, the urbanization rate is introduced in the regressions. Criminals are also well-known to be often young male, especially for violent crimes. This stylised fact will be controlled for by introducing the fraction of male between 15 and 24 years in the overall population. Moreover, sociologists and criminologists have shown that crime is due to family instability and, particularly, that crime rates are highly correlated with the share of female-headed households. Finally, the share of policemen in the population is introduced as a measure of deterrence.

### **3.3 Some descriptive statistics**

Table 1 gives descriptive statistics and correlations between crime rates and socio-economic variables. It confirms some of the intuition of this paper and shows that violent crime against property and against persons do not follow the same scheme. Property crime rises with income (at least reported property crime) but is weakly correlated with social and demographic conditions. It is also positively linked to most of the education variables (actually all education variables excepted the share of population with a primary-schooling level are positively and significantly correlated with economic crime).

Table 1 also shows that interpersonal violence is less influenced by economic conditions than property crime but is significantly dependent from social and demographic conditions. But the most important, and the main difference between interpersonal and economic crime, is the significantly neg-

ative correlation between each education variable and crime against persons. The negative impact of literacy and primary education is particularly significant, which suggests that municipalities with a high share of their population benefiting from basic education are the safest.

< TABLE 1 >

## 4 Results

Results are presented in separate tables for each crime rates. Tables 2 and 3 present results concerning economic crime and interpersonal violence, respectively, while table 4 presents results for violent crime as a whole. In each table, column (1) is an estimate without any education variable, column (2) introduces the average years of schooling, column (3) introduces the literacy rate, column (4) introduces simultaneously the share of adult population with a primary, secondary or tertiary education, respectively, and, finally, column (5) introduces a Gini index of education. Moreover, regional fixed effects are introduced (each micro-region includes about 10 municipalities). All the regressions also include as control variables the average values of each explanatory variable for the neighbors of each municipality (neighborhood being defined as a common border between two municipalities). This is done in order to control for possible spillover effects between municipalities and for the possible mobility of criminals across municipalities. Finally, tests of spatial autocorrelation of crime rates among municipalities have been done (but are not shown here) and suggest the absence of such a correlation under this specification (that is when both a micro-region fixed-effect and neighbors'

average values of explanatory variables are introduced).

< TABLE 2 >

Table 2 shows results rather conform with the discussion above and suggests that income inequality, the share of young male in the population and the share of female-headed households are all significantly correlated with violent crime against persons. However, it also shows mitigated results concerning the effect of the several education variables since only the shares of adult population with primary and secondary education are significantly negatively correlated with violence. The coefficients associated with the other education variables all have the expected sign but are weakly significant. Concerning crime against property, table 3 suggests that basic education (measured alternatively by the literacy rate and the share of adult population with primary education) has a positive influence. A possible explanation is the presence of a measurement error in property crime rates, this error being correlated with education. We have to remember that crime data used here are official data and, as such, record only crimes reported to police. If this reporting rate is correlated with education (that is the more the population is educated, the more crimes will be reported), it could explain the results presented here. Moreover, such a correlation biases the estimator, so the results in Table 3 are subject to caution. This is not the case for table 2, since violent crime against persons is measured with more accuracy. Finally, table 4 suggests that the share of adult population with primary education is the only education variable in the model to be significantly (and negatively) linked to violent crime as a whole.

< TABLE 3 >

The three tables also suggest that the main determinant of violence in Minas Gerais is the inequality of income. The strong and robust correlation between this variable and the several measures of violent crime used here tends to confirm the initial intuition that relative deprivation is crime-enhancing and that the main issue concerning violence is inequality, not the level of income *per se*. These results are in adequacy with stylised facts concerning Brazil as a whole, that is one of the most unequal country in the world and for which it is really the main social issue<sup>5</sup>. Moreover, the introduction of the education variables does not change nor the value neither the significance of the coefficient associated with the Gini index. Tests of difference of coefficients were executed for the Gini index among the several regressions in each table and showed no variation of this coefficient when the education variables are introduced, suggesting that the effect of education is direct or, at least, that education is not related to violence through the channel of inequality.

< TABLE 4 >

## 5 Conclusion and policy implications

The aim of this paper was to study the link between education and violent crime in the context of a developing society, the state of Minas Gerais,

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<sup>5</sup>As an example, in 2000, in Minas Gerais, the richest 10 per cent represented 44 per cent of total income while the poorest 80 per cent represented only 40 per cent.

Brazil, in 2000. Using a database of crime rates at the municipal level, we explored the effect of several education variables on two kinds of violent crime, economic and interpersonal. Results suggest that these two kinds of crime follow very different schemes. On the first hand, development has no significant relation with crime against persons, while income inequality increases it and basic education (primary schooling) appears to be crime-reducing. On the other hand, property crime is enhanced by development (because of the increasing opportunities it induces for criminals) and income inequality.

These results raise several policy implications. First, it appears that the reduction of income inequality is really a crucial issue concerning the improvement of quality of life in Minas Gerais, and in Brazil as a whole. Safer streets will not exist as long as income and assets distribution is so unfair. Second, universal basic education has also a role to play in the reduction of violence in Brazil. More generally, results of this paper suggests that raising citizenship and social capital (education being only one of the several ways to reach this goal) can contribute significantly to reduce violence, and particularly “pure” violence such as homicide or assault. Making basic education universal is particularly needed if we consider that Brazil suffers from “under-education” relatively to its income and development level.

Finally, we have to remember that data used in this paper are official statistics of police, well-known to be downward-biased. A nation-wide or state-wide victimization survey would be welcome in order to compare results presented using official crime rates to those obtained with “true” crime rates.

Table 1: Correlation between crime rates and explanatory variables

Variables	Violent crime against property	Violent crime against persons	Violent crime (total)
Average income 1991	0.4429	-0.1166	0.3491
Gini index	0.3480	0.1206	0.3438
Urbanization rate	0.3804	0.0494	0.3496
Policemen per 100,000 inhabitants	0.1994	0.0567	0.1918
Share of female-headed households	0.2318	0.1942	0.2704
Share of male 15-24 year-old	0.0541	0.2557	0.1316
Average years of schooling	0.4056	-0.1634	0.2997
Literacy rate	0.2821	-0.3095	0.1434
Share of adult population with primary education	-0.1304	-0.3639	-0.2366
Share of adult population with primary education	0.4180	-0.0377	0.3540
Share of adult population with primary education	0.3588	-0.1441	0.2644
Education Gini index	-0.2431	0.2508	-0.1280

Table 2: Education and violent crime against persons

	(1)	(2)	(3)	(4)	(5)
Average income 1991	-0.000 (0.10)	0.001 (0.55)	0.001 (0.37)	-0.000 (0.05)	0.001 (0.27)
Gini index	2.154 (3.08)***	2.296 (3.25)***	2.154 (3.08)***	1.819 (2.61)***	2.115 (3.02)***
Urbanization rate	0.475 (0.94)	0.695 (1.34)	0.654 (1.24)	0.659 (1.23)	0.527 (1.06)
Share of female-headed households	20.226 (2.94)***	21.892 (3.15)***	20.480 (2.99)***	21.059 (3.06)***	20.685 (3.01)***
Share of male 15-24 year-old	25.524 (2.96)***	24.884 (2.91)***	24.086 (2.82)***	23.240 (2.76)***	24.427 (2.87)***
Policemen /100.000 inhabitants	-38.921 (0.67)	-34.759 (0.59)	-35.677 (0.61)	-20.992 (0.36)	-39.836 (0.68)
Average years of schooling		-0.989 (1.55)			
Literacy rate			-1.254 (1.61)		
Adult population with primary education				-4.536 (3.72)***	
Adult population with secondary education				-0.551 (2.09)**	
Adult population with tertiary education				-0.078 (1.28)	
Education Gini index					1.504 (1.57)
Intercept	-6.622 (2.49)**	-5.074 (1.85)*	0.410 (0.09)	-11.177 (2.66)***	-8.218 (2.35)**
Observations	723	723	723	723	723
$R^2$	0.34	0.34	0.34	0.36	0.34

Robust t statistics in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Crime rate and education variables are expressed in logarithms.

All regressions include micro-region fixed-effects as well as neighbors' average values of every explanatory variables.

Table 3: Education and violent crime against property

	(1)	(2)	(3)	(4)	(5)
Average income 1991	0.009 (4.15)***	0.007 (2.98)***	0.007 (3.19)***	0.009 (3.75)***	0.009 (3.96)***
Gini index	3.623 (4.46)***	3.427 (4.26)***	3.477 (4.42)***	3.799 (4.61)***	3.618 (4.45)***
Urbanization rate	0.529 (1.10)	0.281 (0.55)	0.079 (0.16)	0.411 (0.78)	0.526 (1.08)
Share of female-headed households	13.605 (2.18)**	12.097 (1.93)*	14.323 (2.31)**	13.675 (2.12)**	13.630 (2.18)**
Share of male 15-24 year-old	33.331 (4.03)***	33.938 (4.07)***	34.465 (4.14)***	34.520 (4.17)***	33.333 (4.02)***
Policemen /100.000 inhabitants	98.474 (1.52)	87.187 (1.34)	87.678 (1.36)	84.238 (1.31)	98.067 (1.52)
Average years of schooling		1.242 (1.62)			
Literacy rate			3.049 (3.20)***		
Adult population with primary education				2.171 (1.72)*	
Adult population with secondary education				0.391 (1.28)	
Adult population with tertiary education				-0.032 (0.24)	
Education Gini index					-0.149 (0.15)
Intercept	-5.315 (1.84)*	-5.794 (1.96)*	-12.235 (2.37)**	-3.598 (0.72)	-5.726 (1.42)
Observations	723	723	723	723	723
$R^2$	0.46	0.46	0.47	0.46	0.46

Robust t statistics in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Crime rate and education variables are expressed in logarithms.

All regressions include micro-region fixed-effects as well as neighbors' average values of every explanatory variables.

Table 4: Education and violent crime

	(1)	(2)	(3)	(4)	(5)
Average income 1991	0.005 (2.45)**	0.005 (2.30)**	0.004 (2.28)**	0.004 (2.03)**	0.005 (2.57)**
Gini index	2.102 (3.22)***	2.140 (3.31)***	2.029 (3.18)***	1.920 (2.90)***	2.070 (3.19)***
Urbanization rate	0.426 (1.01)	0.506 (1.11)	0.365 (0.79)	0.513 (1.11)	0.461 (1.08)
Share of female-headed households	15.377 (2.58)**	16.131 (2.69)***	15.975 (2.68)***	15.588 (2.59)***	15.735 (2.64)***
Share of male 15-24 year-old	27.465 (3.60)***	27.186 (3.54)***	26.706 (3.48)***	26.382 (3.46)***	26.665 (3.47)***
Policemen /100.000 inhabitants	47.955 (0.91)	46.840 (0.87)	45.511 (0.86)	54.111 (0.98)	46.934 (0.88)
Average years of schooling		-0.309 (0.46)			
Literacy rate			0.377 (0.47)		
Adult population with primary education				-2.497 (2.12)**	
Adult population with secondary education				-0.235 (0.91)	
Adult population with tertiary education				-0.049 (0.73)	
Education Gini index					0.970 (1.06)
Intercept	-5.107 (2.07)**	-4.039 (1.59)	-2.089 (0.46)	-6.882 (1.68)*	-6.628 (2.03)**
Observations	723	723	723	723	723
$R^2$	0.38	0.38	0.38	0.39	0.38

Robust t statistics in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Crime rate and education variables are expressed in logarithms.

All regressions include micro-region fixed-effects as well as neighbors' average values of every explanatory variables.

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