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【要旨】

本研究は２０１３年の家庭調査の全国データを用いて、様々な犯罪や２０１２年に生じた暴力団抗争の休戦状況が、７歳以上２３歳未満のエルサルバドル人の就学の有無や学校選択に与える影響を検討した。分析の結果、犯罪の効果は性別や年齢層によって異なることが明らかになった。殺人、盗難、強盗や恐喝事件は男子の就学や私立学校の選択に有意な負の影響を与えていることが見出された。一方で、犯罪率の高さは１５歳未満の女子の就学や１５歳以上の女子の私立学校の選択に、正の大きな影響を与えることが見出された。

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The Short-Term Impact of Crime on School Enrollment and School Choice: Evidence from El Salvador[1]

Juan N. Martínez[2]

Abstract

This research employs household survey data from El Salvador to evaluate the short-term impact of several measures of crime and a truce between gangs during 2012 on school enrollment and the choice between public and private education for individuals 7 to 22 years old in 2013. The results show that homicides, thefts, robberies and extortions are significantly associated with lower school enrollment and higher attendance to public schools among boys in several age brackets. A robust positive impact of homicide rates and school enrollment for girls under 15 years old, and a positive association between property crimes and the choice of private schools for older girls is observed, possibly reflecting selective investment choices of parents.

JEL Codes: D13, I24, I25

Keywords: DEMAND FOR SCHOOLING; SCHOOL CHOICE; CRIME; EL SALVADOR;

1. INTRODUCTION

El Salvador is one of the most violent countries not at war in the world. With a homicide rate of close to 100 per 100,000 inhabitants in 2014, its capital city, San Salvador, was the 13th most violent city in the world (Mexico's Citizens Council for Public Security and Penal Justice, 2014). Although the methodologies employed for international comparisons of crime rates are a subject of debate, it is undeniable that El Salvador presents in recent years high levels of crime and violence even when compared to other Latin American countries. With more than 6,000 homicides reported during 2015, El

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Salvador is experiencing levels of violence that haven't been seen since the end of its civil war, more than twenty years ago. Opinion surveys by Corporación Latinobarómetro (2011) and the Observatorio de Seguridad Ciudadana (2013) show that over 50% of the Salvadoran population considered violence and crime as the most important policy issues, while the cost of living and unemployment are the next most mentioned problems, both combined representing only 25% of the responses. The Central Bank of El Salvador estimates that the total cost associated with violence and crime, including additional expenditures on the provision of public services, and private sector losses during 2015 was 2,800 million USD, which is equivalent to roughly 11% of the country's GDP (FUSADES, 2016).

Conflicts between street gangs in El Salvador produce considerable volatility in criminal activity, thus making it an interesting case study. It is estimated that roughly 54,000 official members of the three major gangs in Central America populate Guatemala, Honduras and El Salvador, among which roughly 20,000 are based in El Salvador, for a rate of 323 gangsters per 100,000 persons in 2012 (UNODC, 2012). Gang members are mostly found in the 12-24 age bracket (Seelke, 2014). This demographic composition turns school-aged children, especially in poor urban areas, into a group at significant risk of recruitment and aggression, which raises concerns about whether violence and crime have a significant impact on the academic performance of students and the incentives of households to invest in education, whether because of a higher victimization risk, the impact of crime on the budget of households or its effect on expectations about the future returns to education. The literature on education and crime has mostly concentrated on the impact of academic outcomes on future criminal behavior, while the body of literature that explores the relationship in the opposite direction is rather scarce, even in El Salvador, in spite of its relevance.

This research contributes to the previous literature in several dimensions. First, it employs household survey microdata along with data on several types of crimes in order to evaluate the short-term impact of homicides, extortions, robberies and thefts on the probability of enrollment and on the likelihood of being enrolled in a public school for male and female Salvadoran students between 7 and 22 years old. In 2012, a truce between gangs produced an important drop in murder rates across most cities in El

Salvador. This research also evaluates the impact that this unique event had on enrollment and the choice of enrolling in a public school, in an attempt to evaluate the effect of gang-related violence on educative investment of households. The results show that higher levels of crime and violence are associated with a lower probability of enrollment and with migration into freely provided public education, suggesting that public schools serve as safety nets for students that might otherwise be pushed out of the educative system. It also shows that girls react differently to fluctuations in local crime rates, some of them being actually pushed into the educative system in areas with a higher incidence of crime.

The content of this paper is organized as follows: Section 2 reviews previous literature on the impact of crime, especially on educative outcomes, presents the trends of crime rates in the last decade, and introduces the institutional context. Section 3 presents the data and introduces the methodology for the empirical analysis. Section 4 shows the estimation results. Finally, Section 5 discusses the results as well as their robustness to some methodological aspects, and concludes.

2. BACKGROUND INFORMATION AND LITERATURE REVIEW

2.1 CRIME IN EL SALVADOR

As is the case of many Latin American countries, crime levels in El Salvador can show considerable volatility. Figure 1 shows the yearly number of cases of extortions reported by the Civil National Police of El Salvador (hereafter PNC), as well as the yearly growth rate of real GDP from 2007 to 2014. Gangs and other criminal groups extort small businesses and transportation firms in order to obtain resources for their operations. Note that the number of extortions increased by 65% during 2009 compared to the previous year, passing from 2,729 cases to 4,528. After this peak, a decreasing trend can be observed as the economy recovers, suggesting a strong countercyclical pattern for this type of offence. Figure 2 shows the recent evolution of the total monthly property crimes (thefts and robberies[3]), compared with the evolution of the yearly growth rate of the unadjusted Index of Volume of Economic Activity (IVAE, represented by the dashed line

[3] Although extortions are typically considered property crimes, their strong association with the activities of gangs in El Salvador makes it necessary to isolate their effect. For the purpose of this research only thefts and robberies are considered as property crimes.

and measured on the right axis), which is a short-term indicator of economic activity calculated by the Central Bank of El Salvador. Although the correlation between both series is not small, it is clear that this type of offence did not experience a sharp fluctuation during the economic recession of 2009, and rather presents seasonality patterns likely related to the yearly economic cycle. This type of crime shows a decreasing trend, especially during the last two years.

Greater levels of volatility can be found for types of crimes that are directly related to the activities of the two major gangs in the country and the conflict between them. Close to 88% of the total number of gang-related homicides during 2011 were attributed to the 18th Street gang[4] and the MS-13 gang. Both gangs have their origins in the United States, among young Latin American immigrants (Ward, 2013) and held a friendly relationship until 1989, when an incident of obscure details led to a spiral of retaliation, giving rise to a violent conflict that still exists now (Sala Negra, 2012). The operations of both gangs, along with the conflict between them, were brought to Central America during the beginning of the 1990s due to massive deportations and to the enactment of the Illegal Immigrant Reform and Immigrant Responsibility Act (IIRIRA) of 1996 (Seelke, 2014), which sent illegal immigrants, including many with criminal backgrounds, back to their countries of origin. Several years later, especial security operations by the Government of El Salvador led to a large number of convictions, doubling the share of gangsters in jails from 16.2% to 31.2% of the total of inmates between 2002 and 2006 (Savenije, 2009). These policies, along with the practice of separating members of conflicting gangs into different jails, are said to have increased the coordination capabilities of gangs, and allowed them to perform larger scale operations directed, not only towards the enemy gang, but also against the rest of the civil population.

Capitalizing on this coordination capability, a group of civilians, created negotiation conditions with the imprisoned leaders of the major gangs and consolidated a no-aggression agreement between them at the beginning of 2012. In exchange, gangs would obtain better conditions in jails and the possibility of further negotiations. However, it did not include any commitment by the gangs to stop aggressions on other civilians. This

[4] Recently divided into two factions by internal fights, effectively becoming two different gangs.

truce was enforced from March of 2012 and was announced by gangsters at the end of that month. The total number of monthly homicides is represented in Figure 3 by the solid line, while the total number of homicides attributed to gangs is represented by the dashed line. The average number of monthly homicides during the period Jan-2006 to Feb-2012 is roughly 326, with a slightly increasing trend, reaching 404 homicides in the last month of the period. However, by March of 2012, the monthly number of homicides suddenly dropped to 255, and stayed under 260 until March 2014. Note that this drop in total homicides is not reflected in the number of gang-related homicides reported by the PNC, clearly showing that statistics about offences by gangs have largely underestimated the relevance of these groups on total crime fluctuations.

The central government did not provide official recognition or support to the truce and its participation on the negotiations has not yet been clarified. The truce was officially terminated in 2014 after the presidential elections of that same year due to the lack of support to the truce by the newly elected president. Leaders of the gangs were taken back to the maximum security jails, effectively cutting off their communication with their members on the streets and ending any possibility for further negotiation. The number of homicides soared to historical highs during 2015, averaging more than 500 homicides per month and up to 918 during August of the same year. Sharp fluctuations in the numbers of extortions, robberies and thefts are not observed during the period of the truce between gangs

2.2 ON THE IMPACT OF CRIME ON ECONOMIC BEHAVIOR AND EDUCATION

Crime can exert an impact on the education of children through several channels, including its effect on investment decisions through changes in survival rates, on the household budget, on academic performance and on the distribution of investments in human capital inside the household. Soares (2006) shows that the accumulated welfare impact of violence through its effect on survival probabilities is as large as 73% of GDP for El Salvador and 281% in the case of Colombia, while eight out of the ten countries with the largest welfare losses are located in Latin America and the Caribbean. Soares shows that less educated individuals suffer a significantly higher exposure to violence. Households can also be affected by income shocks induced by crime and violence, especially when the family budget depends on the returns of small businesses. Hopkins

(2002) provides evidence that shows that the burden of crime is heavier for firms than for households, and Islam (2014) shows that this burden is especially heavier for small and medium enterprises in developing countries during periods of low economic growth.

The literature on the impact of crime on academic performance is rather scarce. Rud et al. (2014) employ a nationally representative panel dataset to evaluate the intergenerational impact of crime. Their results suggest a robust and significant negative impact of the criminal involvement of parents on their children's educational attainment. Kristoffersen et al. (2015) show that peer-effects are another way through which crime involvement of parents can have an impact on educative attainment. Disruptive children were found to reduce the academic achievement of others by as much as a 2% of a standard deviation, where some of the children are categorized as "disruptive" if their parents have been convicted of a crime before the child turned 6. These papers concentrate on concluding about long term relationships, leaving open the question whether education can react to fluctuations in crime rates in shorter time frames. Orraca (2015) employs a panel dataset of Mexican schools and shows that homicide rates have a negative impact on test scores and increase grade failure rates. The impact in test scores is shown to be larger in secondary schools and is higher when the homicide occurs close to the examination date. In order to account for potential endogeneity of the homicide rate, it employs the closeness of the municipalities to the U.S. border and cocaine seizures in Colombia as instruments.

If education is a normal good, income shocks from crime are likely to produce immediate reductions in private investments on human capital, driving some children out of the educative system, or forcing them to migrate into cheaper, and possibly lower quality schools. Furthermore, the effect of crime through income shocks and higher victimization risk is likely to generate educational inequality inside households. Dahan and Gaviria (2002) show that, in the presence of increasing rates of return to schooling and liquidity restrictions, poor and middle income households tend to show higher educational inequality among siblings in Mexico, Peru and Brazil. Furthermore, this research also shows that siblings' inequality is larger in Brazil for mixed-gender families, suggesting that parents tend to favor girls when unequally distributing their investment in education. The literature on Evolutionary Biology shows that spending on children can be viewed

as reproductive investment, and that expenditure inside the household is likely to be affected by the relative odds of procreation of each gender. For example, Durante et al (2015) shows in an experimental setting that parents are eager to bequeath significantly larger amounts of money and to make larger beneficial expenditures on girls than on boys during an economic recession due to the improved position of females in the marriage market. Perilloux et al (2008) argues that parents have incentives to intervene in the behavior of their children in order to protect their mate value and prevent sexual victimization. This suggests that gender-based educational inequality inside the household can be associated with crime rates if these have an impact on the mating value of one gender over the other, for example, through changes in assortative mating behavior. Along these lines, Abramitzky et al (2011) show that the scarcity of males in France produced by military mortality during World War I is associated with fewer men who stay single, lower divorce rates and an increase of out-of-wedlock births in regions with higher military mortality, reflecting increased chances of procreation for males. The scarcity of men is also associated with a lower likelihood of marrying a bride from a lower class.

In El Salvador, violence is likely to asymmetrically affect the value of children due to the fact that close to 85% of the victims are males (Institute of Legal Medicine of El Salvador, 2010). It is not clear whether crime levels are associated with a higher or lower value of boys over girls. On one hand, crime depresses the economy, possibly leading to prioritizing investment on girls (Durante et al., 2015). On the other hand, parents may find it more profitable to invest in the education of girls if the asymmetric victimization rates negatively affect the relative endowments of boys. Becker and Tomes (1976) show that, when the endowments of children are heterogeneous, and the returns to investments on human capital are affected by the level of such endowments, parents can find it optimal to concentrate human capital investments on the more endowed children, reinforcing the already existing differences. According to 2014 data from the Educative Census, which is collected every year by the Ministry of Education of El Salvador (MINED), only 47.3% of the initial enrollment on the first year of basic education in El Salvador was composed by girls, while this share increases to over 51% towards the last grades of secondary education, suggesting that less girls get enrolled in school, but those who do it tend to survive longer than boys in the educative system. In fact, boys represent over 55% of overage students and roughly 62% of repeating students in secondary education. However,

this trend is hardly attributable to crime alone.

The complex nature of crime makes it unclear whether higher crime levels provide incentives to spend more on the education of girls over boys or vice versa; however, the literature shows many reasons why the relationship between school enrollment and crime must be asymmetric with respect to gender.

2.3 ON THE RELATIONSHIP BETWEEN CRIME AND SCHOOL ENROLLMENT IN EL SALVADOR

Basic education in El Salvador is compulsory and consists of nine years grouped in three three-year cycles. Secondary education offers the choice of two tracks: the General Track and the Technical Track, with a length of two and three years respectively. Both, basic and secondary education are free when provided by the State. Public schools additionally provide free uniforms and basic stationary through the "Paquetes escolares" Program starting from 2010 for basic education students and from 2015 for students in secondary education levels.

Whether violence and crime have an impact on school enrollment of Salvadoran children is a topic that has not been well studied in the past. Government officials base their observations on self-reported information by students and their families. Educative institutions collect information about the students who drop out of school every year, including the reasons for leaving a particular institution. Figure 4 shows the prevalence of the most important reasons for dropping out of school according to data by MINED during 2010 for several stages of the educative system. Moving to a different neighborhood is an important cause, with a prevalence of over 40% of dropouts in the first cycle of basic education, and its prevalence tends to decrease towards the upper levels. The percentage of students who dropped out in order to attend a different school represents a 12% in the first cycle of basic education and its importance decreases for the upper levels. Both, moving to a different neighborhood and changing schools represent cases of migration into the educative system and do not necessarily represent the share of students who effectively abandon it. Note that this kind of migration can also represent the response of households to fluctuations in crime rates in their neighborhoods. In particular, the territorial fights of gangs can provide incentives for moving out of certain

areas, since crossing the borders between territories of opposing gangs can impose severe costs to households.

Crime is the reason given by less than 5% of dropouts in the lowest level of basic education, and grows to roughly 10% for secondary education students, and up to 21% for persons in adult education programs. Note that, once again, it is not clear whether students reporting dropping out because of crime effectively leave the educative system or just migrate inside of it. For the cases when they effectively abandon the system, several reasons explain why older students are more likely to attribute their decision to crime. One reason is differences in victimization risk across age groups: Soares (2006) shows that mortality due to violence increases considerably in Latin America for the 15 to 25 year old group. The Institute of Legal Medicine of El Salvador (hereafter IML) shows that 37.2% of the homicide victims during 2010 were in the 15-24 year old range, where the 15 to 19 year old range accounts for 18% of the victims, compared with a mere 2.1% for children younger than 15 years. Another reason is that younger students have less incentives to drop out due to a lower cost of opportunity for attending school. As human capital accumulates, the potential wage becomes an important cost of opportunity and dropping out of the educative system as a reaction to crime-related shocks becomes a more appealing choice.

Failing to account for migration inside the educative system is likely to exaggerate the impact of crime on school attendance. According to the Educative Census (2014), the public sector accommodates roughly 87% of basic education students and close to 74% of general and technical track secondary education students. Households affected by crime-induced income shocks can manage to reduce their expenditure in education while still allowing their children to stay in the educative system by moving them into cheaper schools or by enrolling them in public education. On the other hand, households concerned with the safety of their children can invest in private transportation services or enroll them into more expensive but safer private educative institutions.

The following sections of this paper attempt to verify empirically whether several types of crimes such as homicides, extortions and property crimes such as robberies and thefts do actually drive children out of the educative system or cause migration into public

schools, and whether the same patterns can be observed for boys and girls. Whether the 2012 truce produced a significant change in enrollment patterns of school-aged children is also evaluated.

3. DATA AND METHODOLOGY

In order to evaluate the impact of crime on enrollment and the public-private education choice of households, this research employs data from the Salvadoran *Encuesta de Hogares de Propósitos Múltiples* (EHPM) 2013, a household survey collected and kindly provided by the Bureau of Statistics of El Salvador (DIGESTYC), which includes information regarding demographic variables, educational enrollment and attainment, health, labor force participation, income and consumption of Salvadoran individuals and their households. It consists of a stratified sample of over 20 thousand households, for a total sample size of over 85 thousand individuals. For this analysis, the sample is restricted to individuals between 7 to 22 years old who reported being the sons or daughters of the head of household. The data on municipal-level homicides, thefts, assaults and extortions was provided by the National Civil Police of El Salvador.

3.1 Measuring the Impact of the Truce

One of the purposes of this paper is to measure the impact of the 2012 truce on enrollment and the choice of schools during 2013. For simplicity, I assume that the only way by which the truce had an impact on these outcomes was by producing a drop on homicide rates under the preexisting trend. In order to obtain a measure of this effect, a panel of the 262 municipalities of El Salvador from 2005 to 2011 is employed to estimate by OLS a linear model of the homicide rate. Controls include up to four period lags of the homicide rate, a dummy variable taking the value of one during 2009 to capture the impact of the economic recession, as well as variables capturing the lagged municipal-level rates of thefts, robberies and gang-related homicides per 100,000 persons and the contemporary municipal population. The results of this model, presented in Table 1, show the high level of self-correlation of the homicide rate and suggest that the 2009 economic recession had a significant impact on the level of violence experienced in the country. After fitting this model, the estimates of the coefficients are employed to obtain a forecast of the 2012 homicide rate, which can be interpreted as a rough measure of the counterfactual homicide rate that would have been observed during that year in the absence of the truce.

Next, the difference between the observed 2012 homicide rate and the counterfactual rate is obtained. For ease of interpretation, these residuals are transformed into standard deviations, and are defined so that their sign is *positive* when the observed homicide rate is **below** the counterfactual rate. These residuals represent a measure of the effect of the truce on homicide rates, and are called hereafter the *truce effect*. In the panel of municipalities, this *truce effect* has a mean of 0.44 standard deviations during 2012, and 198 out of 262 municipalities experienced a drop during that year with respect to the previous trend. A drop in homicide rates is expected to be associated with lower victimization rates. If crime-induced income shocks are the only channel through which violence affects investments in human capital, a positive association between the truce effect and the likelihood of enrollment is expected. Under the same assumption, the *truce effect* is likely to have reduced the probability of students being enrolled in the public educative sector if this type of education can be considered an inferior good.

This *truce effect* is not randomly allocated across municipalities. Enforcing the truce during 2012 could have been especially easier in certain areas depending on characteristics that are also correlated with enrollment and expenditure in education, and that are not captured by the model estimated in Table 1. While the truce was the result of a coordination effort by leaders of the gangs, these are highly decentralized groups (Ward, 2013) and the difficulty of the enforcement of the agreement is likely to vary between geographical areas. A clear source of bias is the existence of *Sanctuary Cities*, also called *Cities Free of Violence*. In these special cities, gangs agreed during 2012 to go beyond the content of the original truce and reduce the number of all sorts of crimes and where municipal authorities and private enterprises would provide opportunities for facilitating the access to the labor market for gangsters who decide to abandon their involvement in illicit activities (Valencia, R. 2012 and 2015)[5]. The 11 cities that adopted this model[6] experienced in 2011 a mean homicide rate of 94 cases per 100,000 persons, which was reduced to 47.8 cases during 2012 (a reduction of 49%). In comparison, *non-sanctuary* cities were experiencing a considerably lower mean homicide rate of 43.7 in 2011, which was reduced to 33.7 during 2012 (for a reduction of 22.9%). Evidently, more violent cities

[6] Apopa, Ciudad Delgado, Ilopango, La Libertad, Nueva Concepción, Puerto El Triunfo, Quezaltepeque, San Vicente, Santa Tecla, Sonsonate and Zacatecoluca.

were more likely to adopt the *Sanctuary City* model, which also led to a higher drop in homicide rates. Failing to control for this lack of randomness can bias the estimate of the coefficient of the *truce effect* under the assumption that previous violence levels are associated with school enrollment.

Additionally, two types of biases can be expected when employing the *truce effect* as an explanatory variable: the first sort of bias is likely to arise if the reduction in crime due to the truce happened in areas with higher levels of income and educational attainment, assuming that these characteristics are associated with enrollment and the likelihood of attending a public school. On the other hand, a second sort of bias can be expected due to the correlation between the *truce effect* and previous crime levels, assuming that crime is significantly associated with educative enrollment and the choice of public schools. The correlation between the *truce effect* and homicide rates with a lag of up to three years is over 0.5, indicating that this sort of bias is to be expected. When employing other measures of crime, controlling for previous homicide rates implicitly controls for the pre-existing mortality risk of males, which is likely to affect their enrollment and that of girls in the same municipality.

3.2 Econometric Model

The probability of enrollment and the choice of a public school is estimated by the following Probit models for the *i*-th individual living in the *j*-th municipal region:

$$\Phi^{-1}(\Pr(E = 1|Cr, X)) = \beta_0 + \beta_1 \mathrm{Cr}_{\,j} + \gamma_t X_{i,j} + u_{i,j} \quad (3)$$

$$\Phi^{-1}(\Pr(Pub = 1|Cr, X, E = 1)) = \beta_0 + \beta_1 \mathrm{Cr}_{\,j} + \gamma_t X_{i,j} + u_{i,j} \quad (4)$$

Where *E* takes the value of one for children who reported being enrolled in school during 2013, and *Pub* takes the value of one for children enrolled in a public school in the same year. *Cr* represents the measures of crime employed. Both equations are estimated employing as measures of crime: the *truce effect*, which is measured in standard deviations with respect to the previous trend, and the homicide rate, the property crime rate (thefts and robberies) and the extortion rate, all of them per 100,000 inhabitants in the municipality during 2012. In El Salvador, the school year begins in the second half of

January. Enrollment decisions are likely to incorporate expectations about the victimization risk of children based on the previous year crime level. Even when expectations are not at play, income shocks are likely to impact enrollment as soon as the following school year begins. X represents a set of individual and family level controls including: age, dummy variables for female, married, and urban residence, as well as a continuous variable for the maximum years of schooling of the head of household and the spouse. It also includes dummy variables indicating whether the household is classified as relatively poor or extremely poor[7]. These variables attempt to control for the individual and household-level characteristics of children that are likely to be confounded with the impact of crime. Additionally, X contains a dummy variable identifying "Sanctuary Cities", controls for the homicide rates for the years 2009, 2010 and 2011 and the population of the city of residence of the individual during 2012. Equation (4) is estimated by including only the group of students who responded being enrolled in school.

Summary statistics of the main covariates are shown in Table 2 for two age groups. The enrollment rate up to age 14 is over 90% for both genders, and drops to roughly 50% for the older group. 99% of the children who enrolled in school in both age groups reported attending school during the time of the survey, which indicates that the main barrier to advancement is failing to enroll in school, rather than dropping out of it once enrolled. Among those enrolled in school, 91% of the individuals in the youngest group is in the public education sector, and no difference between genders is observed. For the oldest group, the share of students who attend a public institution declines to 80% for male students and 76% for female students. Monthly expenditure in education per child among those spending a positive amount has a sample mean of $18.61 for the younger group and over $56 for the older one. Individuals in the sample were exposed on average to a drop of homicide rates due to the 2012 truce of roughly 0.73 standard deviations with respect to the previous trend. The mean homicide rate and extortion rate are both roughly 40 cases per 100,000 persons, while the mean property crimes rate (thefts and robberies) is slightly over 220 cases.

[7] Under the definition by DIGESTYC, households in extreme poverty are those where the income per capita is not enough to cover the basic food basket. Households in relative poverty are those for which the per-capita income is larger than the basic food basket, but not larger than twice its value. This ranking is expected to be less prone to the bias from under-reporting than the monetary amount of income.

Finally, it is necessary to discuss the potential impact of the sample design on the estimation results. The EHPM 2013 is obtained from a stratified sample, where the strata are chosen attending to socio-economic and industrial conditions of the sampling units. The survey was designed to be representative to the country-level, urban and rural areas, the 14 main administrative divisions of the country, the metropolitan area of San Salvador and the 50 largest municipalities, but not for each municipality. This design is likely to bias the estimates of the *truce effect* if the response of households to crime levels is heterogeneous across cities (Solon, Haider and Wooldridge, 2013). In order to account for sample design, the estimations are performed employing sampling weights provided by DYGESTIC.

4. RESULTS

The estimation results are shown in Tables 3 to 6, which present the marginal effects for the Probit models in Equations (3) and (4) for the samples of males and females in two age groups. On each table, the name of the column indicates the measure of crime being employed. Other controls included in all models but not shown are the 2012 population of the municipality of residence of the individual, and the corresponding homicide rate for the years 2009 to 2011, as well as a dummy variable for *Sanctuary Cities*.

Paying attention first to Table 3, the pattern of marginal effects of the measures of crime is consistent with the hypothesis that higher levels of crime and violence reduce the likelihood of enrollment. Significant negative impacts can be observed in the group of boys between 7 and 14 years old for property crimes (thefts and robberies) and extortions, with significance levels of 1% and 5% respectively. No significant effect is observed in the case of the *truce effect* and the homicide rate in both age groups. It is rather puzzling that violence levels are not significantly associated with a lower enrollment probability for working age individuals. The death of a parent or an income-generating family member is likely to push working age boys into the labor market and possibly out of the school; therefore, a significant impact of the *truce effect* and the homicide rate was expected for this demographic group. However, no such an effect is observed. In all models in Table 3, age is negatively associated with the likelihood of enrollment. Individuals in urban areas are more likely to be enrolled due to the improved availability

of educational infrastructure. Extremely poor households are less likely to enroll their children compared to households that are not poor, while no such a significant difference can be observed for relatively poor households. The academic attainment of parents increases the likelihood of enrollment in both groups, while married individuals are significantly less likely to attend school.

Table 4 shows the marginal effects on the probability of attending a public school according to Equation (4) for male students. The pattern of the signs of the marginal effects indicates that crime is associated with higher public school enrollment. For the younger group of individuals, a positive impact, significant to the 5% level can be observed in the case of the extortion rate. The measures of crime show a higher degree of association with the likelihood of public school enrollment among individuals between 15 and 22 years old. The drop in homicide rates attributable to the truce shows a negative and significant impact to the 5% level, while the homicide rate and the extortion rate show a positive association with significance levels of 5% and 1% respectively. As exposed in the previous section, a positive value of the *truce effect* represents a drop on the homicide rate under the previous trend during 2012. The negative coefficient observed in Table 4 does not necessarily imply that households decided to enroll their children less in public schools due to reduced violence levels, since the agreement between gangs is not expected to have had a significant immediate impact on long-term expectations of violence and crime. Instead, a more likely interpretation is that male students who would have had to migrate to public schools as a result of violence in their neighborhoods, did not have to do so due to the sudden drop in homicide rates brought by the 2012 truce between gangs. Given that homicide rates are positively associated with public school attendance, it is natural that the reduction in crime rates attributable to the truce has the opposite effect, by preventing income shocks that would lead students to enroll in cheaper public schools. As for the coefficients of other controls, poor households present a significantly higher probability of sending their children to public schools, especially for students over 15 years old, while having more educated parents and living in an urban area decrease the odds of enrolling in a public institution in both groups. Altogether, the results show that younger male students are driven out of the educative system by thefts, robberies and extortion, while types of crimes that are more strongly associated with the activity of gangs, such as homicides and extortions, drive working age males into public schools.

In the case of female students the results differ greatly. Table 5 shows the results for the enrollment equations for girls. First, among girls between 7 to 14 years old, the homicide rate tends to increase the likelihood of enrollment, while the drop in violence attributed to the truce exerted a negative impact. Both effects are significant to the 5% level. This pattern is the opposite of the one observed in the case of males. For the group of girls 15 to 22 years old, the pattern of the marginal effects resembles that of males, although no significant effects are identified at conventional levels. Finally, Table 6 shows that, property crimes and extortions tend to significantly increase girls' likelihood of enrolling in a public school to the 5% and 1% levels respectively. However, the level of property crimes is associated with a decrease in public school enrollment for the older group of female students. Married female students are not observed in the sample, as women are highly likely to abandon school after getting married[8]. The coefficients obtained for other control variables resemble those found in the case of males in all models.

5. DISCUSSION AND CONCLUSIONS

This paper evaluated the impact of several types of crime on the school enrollment and the public-private education choice of individuals between 7 to 22 years old, and examined the existence of differences in these relationships attending to the gender of the individual. The results in the previous section showed that several measures of crime are significantly associated with enrollment and the choice of the type of school among school-aged individuals in El Salvador. The results suggest that this relationship is heterogeneous across demographic groups.

Marginal effects by themselves are not very informative about the magnitude of these impacts. One way of evaluating their economic significance is by putting them in terms of another relevant variable. The Panel A of Table 7 presents the relative effect of crime on the probability of enrollment, calculated by multiplying the marginal effect of each

[8] Dahan and Gaviria (2002) refrain from including fertile age women in the sample, since it is likely to introduce selection bias. In order to verify this possibility, Equations (3) and (4) were re-estimated for the female sample including only women between 14 and 18 years old. No reversion in the signs of the coefficients can be observed, and the significant negative impact of property crime rates on female public school attendance is still significant to a 5% level.

measure of crime on the corresponding gender and age group by the sample mean of the same measure of crime, and dividing by the marginal effect of an additional year of maximum schooling of the parents. The relative effect of crime on the probability of public school enrollment is calculated in a similar way and presented on Panel B of Table 7. The relative effect can be interpreted as the number of additional years of education of the parents that yields the same effect on enrollment as the sample mean level of a given measure of crime. Only relative effects for coefficients that are significant to the 5% level in Tables 3 to 6 are presented.

Panel A includes only the younger group of children, since no significant effects were observed for individuals older than 14 years. Panel A shows that boys and girls are affected by different types of crimes; young boys are significantly affected by robberies, thefts and extortions, and this impact is equivalent to the loss of more than one year of schooling of the parents. Girls receive a significant positive impact from higher murder rates on the probability of school enrollment that is as large as the effect of two additional years of education of the parents. This is a large effect, considering that the mean years of schooling of parents for this age group is 6.8 years. The reduction in the probability of enrollment of girls is also equivalent to losing more than one year of education of the parents. The negative impact of crime on enrollment is likely to be the result of an income effect and of the impact of violence and criminal activity on the academic performance of the students. However, the fact that strong positive effects are observed for females is likely reflecting substitution effects such as those described in Section 3. Girls who don't enroll at the lowest grades are likely to perform domestic tasks or help their parents in the family business. Such activities can be considered more risky than attending a school, especially if the girl has to work on the street. Enrolling them in school, even if a public one, can be one way of protecting them from the dangers of crime.

Panel B shows that the probability of being enrolled in a public school given enrollment receives the largest impact from crime for boys in the older age group. In particular, the mean homicide rate has the effect of increasing the probability of enrolling in a public school that is equivalent to the impact of deducting 3.4 years of schooling from their parents' education, which is larger than 50% of the mean sample of school attainment of heads of household. The reader must consider that 2012 presented abnormally low

homicide rates as a result of the truce between gangs, so this effect can be even larger on an average year. Finally, the probability of entering a public school for girls in the older age group is considerably reduced by property crime rates, with a mean impact that is equivalent to the effect of more than 3 years of schooling of their parents.

The impact of applying sample weights must be evaluated in order to assess the robustness of these results. Solon, Haider and Wooldridge (2013) point out that finding strong contradictions when comparing weighted and unweighted coefficients can signal misspecification issues. Therefore, robustness tests are performed by re-estimating Equations (3) and (4) without employing sample weights. Table 8 compares the sets of coefficients under both cases for each gender and age group. Panels A and B show the estimated marginal effects for Equations (3) and (4) respectively. The signs of the coefficients remain unchanged in most of the equations, and the negative impact of the *truce effect* on enrollment on the younger group of girls is still significant to the 10% level when weights are not employed, while the effect of the same variable on the choice of a public school for girls over 14 years old is significant to the 5% level. In general, large fluctuations cannot be observed, and the patterns of the signs remain consistent with those obtained when employing sample weights. The coefficients were also re-estimated employing data on municipal-level homicides provided by the Institute of Legal Medicine of El Salvador. This measure is based on death certificates and is therefore less prone to measurement error due to underreporting. However, the high degree of correlation between these series and the ones provided by the PNC results in coefficients that do not differ in a significant way from the ones presented above.

Finally, it is also necessary to evaluate the robustness of the conclusions to the effect of differences in the educative supply across municipalities. Public schools, which serve the majority of students in El Salvador, tend to concentrate on providing basic education levels, especially at the first two cycles (grades 1^{st} to 6^{th}). The decrease in the number of schools from the last cycle of basic education is reflected in a sharp increase in the number of students per school, especially from the 7^{th} grade and the first year of secondary education. This reduced educative supply can force students to migrate to urban centers with higher crime rates, which constitutes a potential confounding factor in the regressions presented above. In order to test the robustness of the model to this particular

source of bias, data from the educative census of 2013 is employed to obtain the number of students per school for the grade that corresponds to the age of each child in the sample, which is employed as an additional control. This model is estimated for the group of students in the 7 to 14 years old bracket and the 15 to 18 years old group[9]. These results are not directly comparable with those presented above due to the differences in the sample definition; however, robustness can be assessed by verifying whether the conclusions so far still hold. Marginal effects for this model are shown in Table 9. While significance is greatly reduced due to employing a smaller sample, the main conclusions remain unchanged. Boys over 12 years old are the most affected group, with robberies, thefts and extortions exerting a negative impact on their enrollment and increasing their likelihood of attending a public school. Girls under 12 years old are more likely to be enrolled in school in areas with higher homicide rates, while property crimes are associated with higher attendance to private schools for girls under 18 years old.

Altogether, the findings previously presented show that crime can have relatively large effects on educational choices even in the short term. They also show that the nature of the impact depends on the type of crime, as well as on the demographic characteristics of the affected population. Crime does not only produce school desertion, but also induces migration inside the educative system, with public education serving as a safety net for students who would otherwise end up leaving the educative system. While this helps to alleviate the increase in desertion rates likely to be caused by raising violence levels, it also poses a significant challenge for public authorities by increasing the amount of expenditure required to overcome the already existing deficiencies of the Salvadoran educative system. Furthermore, the findings presented in this paper show that violence levels can actually push some girls into the educative system and into safer private schools, causing asymmetries in the intra-household distribution of human capital investments.

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[9] Educative census data is not available for higher education levels, thus the sample is restricted to the age at which a student would graduate from a three-year secondary education program.

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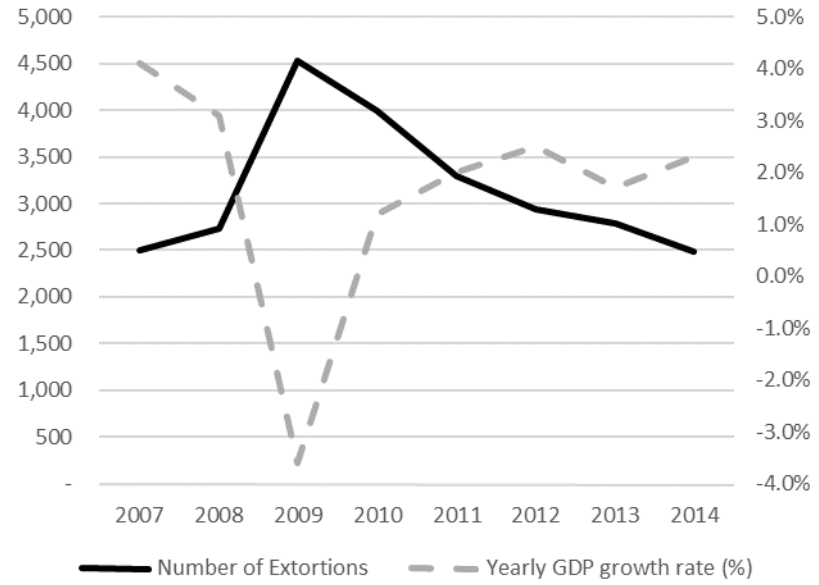
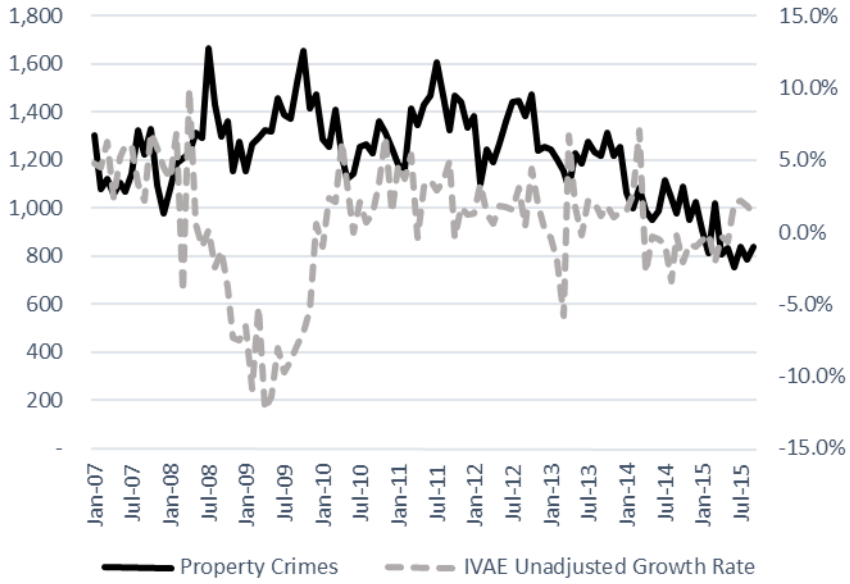
Figure 1: Evolution of Yearly Cases of Extortion and Economic Growth



Source: Own elaboration based on data by the Civil National Police and the Central Bank of El Salvador

Figure 2: Evolution of Monthly Property Crimes (Thefts and Robberies) and Economic Activity

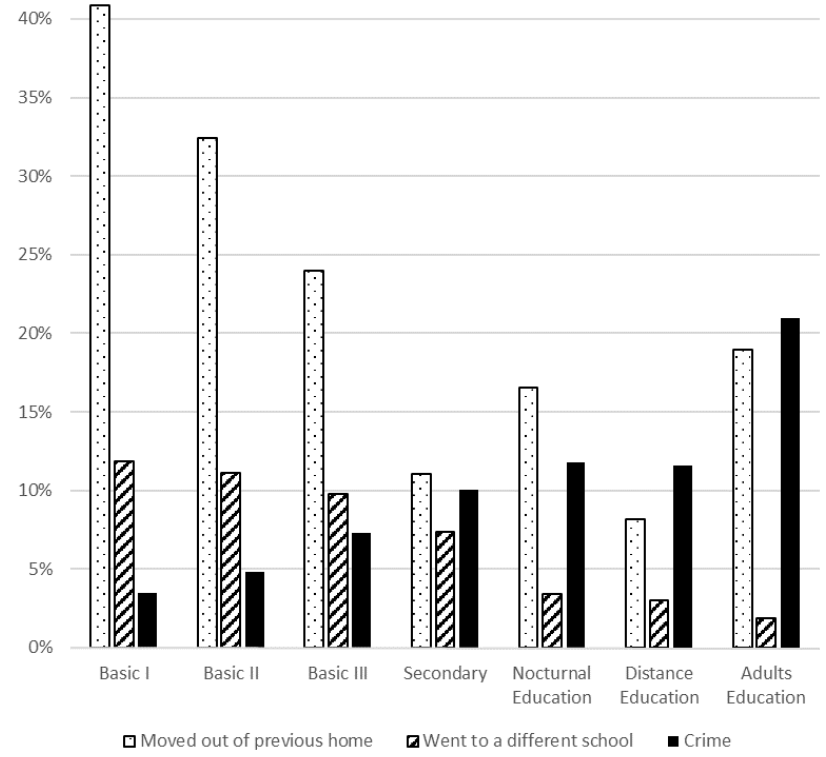


Source: Own elaboration based on data by the Civil National Police and the Central Bank of El Salvador

Figure 3: Evolution of Monthly Number of Homicides

Source: Own elaboration based on data by the National Civil Police of El Salvador

Figure 4: Reasons to Abandon School (2010)



Source: Own elaboration based on data by the Ministry of Education of El Salvador, 2010

Table 1: Estimation of the Trend in Homicide Rates from 2005 to 2011

	Coefficient (SE)
Homicide Rate per 100,000 persons (t-1)	0.31782***
	(0.04111)
Homicide Rate per 100,000 persons (t-2)	0.21226***
	(0.04140)
Homicide Rate per 100,000 persons (t-3)	0.19683***
	(0.04816)
Homicide Rate per 100,000 persons (t-4)	0.24734***
	(0.04551)
Robberies Rate per 100,000 persons (t-1)	0.01533
	(0.02048)
Thefts Rate per 100,000 persons (t-1)	0.00655
	(0.01297)
Gang Homicide Rate per 100,000 persons (t-1)	0.06716
	(0.16553)
2009 Recession Dummy	8.94618***
	(2.49703)
Population (t)	-0.00002
	(0.00003)
Constant	4.97462
	(2.55983)
Observations	786
R2	0.492

'* p<0.1, ** p<0.05, *** p<0.01.
Each observation corresponds to one of the 262 municipalities for each year on the period of analysis.

Table 2: Sample Means of Variables Employed in the Analysis

Variable	5-14 years	15-22 years
Enrollment rate (males)	94.7%	50.4%
Enrollment rate (females)	94.6%	55.1%
Attendance Given Enrollment (males)	99.2%	99.0%
Attendance Given Enrollment (females)	99.6%	98.9%
Enrolled in a Public Educative Institution (males)	91.1%	80.3%
Enrolled in a Public Educative Institution (females)	91.3%	75.9%
Total Expenditure in Education (USD per Month)※	$18.61	$55.66
Truce Effect (standard deviations from the trend)	0.7	0.7
Homicide Rate 2012 in the City of Residence (per 100,000 inhabitants)	42.5	41.6
Property Crime Rate 2012 in the City of Residence (per 100,000 inhabitants)	220.7	226.7
Extortion Rate 2012 in the City of Residence (per 100,000 inhabitants)	40.3	40.8
Age	10.8	18.1
Female	49.4%	45.7%
Urban	46.8%	50.0%
Married	0.0%	3.3%
Extremely Poor	15.2%	11.3%
Relatively Poor	34.5%	28.6%
Max Education of Head of Household and Spouse (years)	6.8	6.0

※Among those who spend a positive amount

Table 3: Marginal Effects on the Probability of School Enrollment: Males

	7-14 Years Old				15-22 Years Old			
Measure of Crime:	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012**	**Extortion Rate 2012**	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012**	**Extortion Rate 2012**
Crime	0.00709	-0.00029	-0.00007***	-0.00025**	0.00011	-0.00027	-0.00008	-0.00038
	(0.00654)	(0.00023)	(0.00002)	(0.00010)	(0.01436)	(0.00049)	(0.00006)	(0.00029)
Age	-0.00917***	-0.00919***	-0.00925***	-0.00897***	-0.08121***	-0.08120***	-0.08099***	-0.08122***
	(0.00201)	(0.00200)	(0.00199)	(0.00198)	(0.00314)	(0.00313)	(0.00314)	(0.00308)
Urban	0.01589**	0.01580**	0.01608**	0.01485**	0.11222***	0.11146***	0.11152***	0.11064***
	(0.00770)	(0.00768)	(0.00775)	(0.00721)	(0.01741)	(0.01743)	(0.01740)	(0.01685)
Married					-0.31507***	-0.31564***	-0.31487***	-0.31475***
					(0.07244)	(0.07258)	(0.07201)	(0.07182)
Extremely Poor	-0.02560**	-0.02578**	-0.02625**	-0.02593**	-0.07994**	-0.08056***	-0.08266***	-0.08132***
	(0.01076)	(0.01077)	(0.01076)	(0.01078)	(0.03120)	(0.03115)	(0.03136)	(0.03144)
Relatively Poor	-0.01134	-0.01141	-0.01110	-0.01029	-0.01932	-0.01954	-0.02053	-0.01950
	(0.00923)	(0.00923)	(0.00918)	(0.00906)	(0.01992)	(0.01986)	(0.01967)	(0.01984)
Max. Educ. of Parents	0.00923***	0.00923***	0.00924***	0.00919***	0.02416***	0.02414***	0.02414***	0.02412***
	(0.00126)	(0.00125)	(0.00127)	(0.00119)	(0.00178)	(0.00178)	(0.00177)	(0.00180)
Pseudo R2	0.1503	0.1507	0.1541	0.1547	0.2546	0.2547	0.2554	0.2555
Observations	5,366	5,366	5,366	5,366	5,500	5,500	5,500	5,500

Dependent variable takes the value of one if the student is enrolled in a public school and zero otherwise. Other controls include the homicide rate from 2011 to 2009, a dummy variable for Sanctuary Cities and the 2012 population of the city. All models include a constant term. Robust Standard Errors clustered to the municipality level in parentheses. The estimations are performed applying sampling weights.
* p<0.1, ** p<0.05, *** p<0.01.

Table 4: Marginal Effects on the Probability of Choice of Public School: Males

	7-14 Years Old				15-22 Years Old			
Measure of Crime:	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012**	**Extortion Rate 2012**	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012**	**Extortion Rate 2012**
Crime	-0.01251	0.00047	0.00004	0.00042**	-0.04551**	0.00170**	0.00009	0.00073***
	(0.01607)	(0.00048)	(0.00003)	(0.00017)	(0.02214)	(0.00073)	(0.00006)	(0.00027)
Age	-0.00048	-0.00045	-0.00053	-0.00081	-0.03760***	-0.03743***	-0.03738***	-0.03736***
	(0.00237)	(0.00238)	(0.00235)	(0.00233)	(0.00781)	(0.00785)	(0.00797)	(0.00792)
Urban	-0.14089***	-0.14062***	-0.14257***	-0.14125***	-0.10626***	-0.10568***	-0.11492***	-0.11320***
	(0.02246)	(0.02219)	(0.02223)	(0.02196)	(0.02781)	(0.02804)	(0.02854)	(0.02757)
Married					0.07889	0.08062	0.08674	0.09077
					(0.16964)	(0.16973)	(0.17100)	(0.17237)
Extremely Poor	0.01581	0.01545	0.01637	0.01732	0.36920***	0.36866***	0.37337***	0.37409***
	(0.02729)	(0.02736)	(0.02740)	(0.02708)	(0.10694)	(0.10721)	(0.10751)	(0.10712)
Relatively Poor	0.06450***	0.06471***	0.06478***	0.06410***	0.10575***	0.10590***	0.10618***	0.10876***
	(0.02225)	(0.02221)	(0.02237)	(0.02247)	(0.02174)	(0.02164)	(0.02147)	(0.02140)
Max. Educ. of Parents	-0.01980***	-0.01980***	-0.01996***	-0.02004***	-0.02099***	-0.02100***	-0.02139***	-0.02123***
	(0.00256)	(0.00257)	(0.00261)	(0.00257)	(0.00293)	(0.00293)	(0.00297)	(0.00293)
Pseudo R2	0.3319	0.3320	0.3324	0.3352	0.2696	0.2703	0.2692	0.2725
Observations	5,038	5,038	5,038	5,038	2,745	2,745	2,745	2,745

Dependent variable takes the value of one if the student is enrolled in a public school and zero otherwise. The sample is restricted to children who reported being enrolled in school during the current year. Other controls include the homicide rate from 2011 to 2009, a dummy variable for Sanctuary Cities and the 2012 population of the city. All models include a constant term. Robust Standard Errors clustered to the municipality level in parentheses. The estimations are performed applying sampling weights.
* p<0.1, ** p<0.05, *** p<0.01.

Table 5: Marginal Effects on the Probability of School Enrollment: Females

	7-14 Years Old				15-22 Years Old			
Measure of Crime:	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012**	**Extortion Rate 2012**	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012**	**Extortion Rate 2012**
Crime	-0.01548**	0.00047**	-0.00001	0.00007	0.00188	-0.00035	-0.00006	-0.00012
	(0.00697)	(0.00023)	(0.00003)	(0.00009)	(0.01564)	(0.00051)	(0.00004)	(0.00021)
Age	-0.01301***	-0.01297***	-0.01306***	-0.01307***	-0.07834***	-0.07835***	-0.07838***	-0.07839***
	(0.00202)	(0.00202)	(0.00206)	(0.00206)	(0.00293)	(0.00291)	(0.00280)	(0.00290)
Urban	0.01511**	0.01471*	0.01387*	0.01448*	0.12044***	0.11956***	0.12001***	0.12020***
	(0.00765)	(0.00769)	(0.00769)	(0.00772)	(0.01814)	(0.01800)	(0.01781)	(0.01800)
Married					-0.44613***	-0.44455***	-0.44504***	-0.44555***
					(0.08109)	(0.08127)	(0.08123)	(0.08102)
Extremely Poor	-0.02193**	-0.02201**	-0.02350***	-0.02324***	-0.09087***	-0.09159***	-0.09066***	-0.09090***
	(0.00853)	(0.00862)	(0.00861)	(0.00860)	(0.03199)	(0.03199)	(0.03248)	(0.03208)
Relatively Poor	-0.00283	-0.00294	-0.00332	-0.00358	-0.02116	-0.02146	-0.02145	-0.02085
	(0.00705)	(0.00707)	(0.00719)	(0.00720)	(0.01993)	(0.01988)	(0.01994)	(0.01993)
Max. Educ. of Parents	0.00934***	0.00938***	0.00944***	0.00944***	0.02423***	0.02422***	0.02434***	0.02419***
	(0.00102)	(0.00103)	(0.00103)	(0.00103)	(0.00209)	(0.00209)	(0.00208)	(0.00210)
Pseudo R2	0.2083	0.2075	0.2032	0.2035	0.2428	0.2430	0.2432	0.2429
Observations	5,241	5,241	5,241	5,241	4,626	4,626	4,626	4,626

Dependent variable takes the value of one if the student is enrolled in a public school and zero otherwise. Other controls include the homicide rate from 2011 to 2009, a dummy variable for Sanctuary Cities and the 2012 population of the city. All models include a constant term. Robust Standard Errors clustered to the municipality level in parentheses. The estimations are performed applying sampling weights.
* p<0.1, ** p<0.05, *** p<0.01.

Table 6: Marginal Effects on the Probability of Choice of Public School: Females

	7-14 Years Old				15-22 Years Old			
Measure of Crime:	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012**	**Extortion Rate 2012**	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012**	**Extortion Rate 2012**
Crime	-0.02174	0.00087	0.00006**	0.00046***	-0.01761	-0.00039	-0.00026***	-0.00050
	(0.01832)	(0.00057)	(0.00003)	(0.00012)	(0.02344)	(0.00090)	(0.00007)	(0.00032)
Age	-0.00635**	-0.00628**	-0.00626**	-0.00651***	-0.03712***	-0.03707***	-0.03759***	-0.03756***
	(0.00250)	(0.00249)	(0.00244)	(0.00250)	(0.00821)	(0.00818)	(0.00778)	(0.00802)
Urban	-0.15726***	-0.15681***	-0.16127***	-0.16065***	-0.06211**	-0.06643***	-0.06838***	-0.06700***
	(0.02455)	(0.02485)	(0.02533)	(0.02554)	(0.02556)	(0.02531)	(0.02483)	(0.02598)
Married								
Extremely Poor	0.06774	0.06838	0.07125*	0.07091*	0.30539***	0.30716***	0.31960***	0.30758***
	(0.04239)	(0.04237)	(0.04210)	(0.04251)	(0.06195)	(0.06253)	(0.07058)	(0.06320)
Relatively Poor	0.08424***	0.08495***	0.08680***	0.08441***	0.15867***	0.15974***	0.15345***	0.15902***
	(0.01482)	(0.01465)	(0.01482)	(0.01480)	(0.03265)	(0.03277)	(0.03136)	(0.03246)
Max. Educ. of Parents	-0.01751***	-0.01752***	-0.01776***	-0.01797***	-0.01963***	-0.01968***	-0.01873***	-0.01963***
	(0.00171)	(0.00171)	(0.00176)	(0.00182)	(0.00239)	(0.00239)	(0.00242)	(0.00240)
Pseudo R2	0.3358	0.3364	0.3363	0.3390	0.2281	0.2279	0.2385	0.2296
Observations	4,942	4,942	4,942	4,942	2,518	2,518	2,518	2,518

Dependent variable takes the value of one if the student is enrolled in a public school and zero otherwise. The sample is restricted to children who reported being enrolled in school during the current year. Other controls include the homicide rate from 2011 to 2009, a dummy variable for Sanctuary Cities and the 2012 population of the city. All models include a constant term. Robust Standard Errors clustered to the municipality level in parentheses. The estimations are performed applying sampling weights.
* p<0.1, ** p<0.05, *** p<0.01.

Table 7: Mean Effects of Several Measures of Crime on Enrollment and School Choice in Terms of Additional Years of Schoolings of the Parents

Panel A: Marginal Effects of Crime on the Probability of Enrollment in Terms of Additional Parents Education					
		Truce Effect	**Homicide Rate 2012**	**Property Crime Rate 2012 ※**	**Extortion Rate 2012**
Males	7-14 Years Old			-1.67	-1.10
Females	7-14 Years Old	-1.21	2.13		
Panel B: Marginal Effects of Crime on the Probability of Public School Enrollment in Terms of Additional Parents Education					
		Truce Effect	**Homicide Rate 2012**	**Property Crime Rate 2012 ※**	**Extortion Rate 2012**
Males	7-14 Years Old				-0.85
	15-22 Years Old	1.61	-3.37		-1.40
Females	7-14 Years Old			-0.75	-1.03
	15-22 Years Old			3.15	

Calculated as the corresponding sample mean crime rate multiplied by the marginal effect of the same crime measure and divided by the marginal effect of maximum years of schooling of the heads of household, all estimated in the same equation for each demographic group.

Includes only ratios where the corresponding marginal effect is significant with a level of 5% in the original model.

※Includes only thefts and robberies.

Table 8: Comparison of Weighted and Unweighted Marginal Effects

Panel A: Marginal Effects of Measures of Crime on the Probability of Enrollment

		7-14 Years Old				15-22 Years Old			
		Truce Effect	**Homicide Rate 2012**	**Property Crime Rate 2012※**	**Extortion Rate 2012**	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012※**	**Extortion Rate 2012**
Males	Weighted	0.00709	-0.00029	-0.00007***	-0.00025**	0.00011	-0.00027	-0.00008	-0.00038
	Unweighted	0.00553	-0.00019	-0.00004*	-0.00006	0.00263	-0.00016	-0.00001	0.00022
Females	Weighted	-0.01548**	0.00047**	-0.00001	0.00007	0.00188	-0.00035	-0.00006	-0.00012
	Unweighted	-0.01354*	0.00036	-0.00004	0.00007	0.00328	-0.00028	-0.00002	0.00004

Panel B: Marginal Effects of Measures of Crime on the Probability of Public School Enrollment

		7-14 Years Old				15-22 Years Old			
		Truce Effect	**Homicide Rate 2012**	**Property Crime Rate 2012※**	**Extortion Rate 2012**	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012※**	**Extortion Rate 2012**
Males	Weighted	-0.01251	0.00047	0.00004	0.00042**	-0.04551**	0.00170**	0.00009	0.00073***
	Unweighted	-0.00912	0.00039	0.00005	0.00025	-0.04057**	0.00138**	0.00008	0.00059**
Females	Weighted	-0.02174	0.00087	0.00006**	0.00046***	-0.01761	-0.00039	-0.00026***	-0.00050
	Unweighted	-0.01602	0.00059*	0.00001	0.00026**	-0.03739**	0.00081	-0.00008	0.00004

All models are estimated employing the same set of controls as the models in Tables 3 to 6. * p<0.1, ** p<0.05, *** p<0.01.

※Includes only thefts and robberies.

Table 9: Marginal Effects on the Probability of Enrollment and Choice of Public School Including Educational Supply Controls

	7-12 Years Old				13-18 Years Old			
	Truce Effect	**Homicide Rate 2012**	**Property Crime Rate 2012※**	**Extortion Rate 2012**	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012※**	**Extortion Rate 2012**
Males	0.00914	-0.00029	-0.00005**	-0.00008	-0.00517	-0.00021	-0.00011**	-0.00035*
Females	-0.00965**	0.00026*	0.00000	0.00013*	-0.01618	0.00054	0.00001	-0.00006

Panel B: Marginal Effects on the Probability of Public School Enrollment

	7-12 Years Old				13-18 Years Old			
	Truce Effect	**Homicide Rate 2012**	**Property Crime Rate 2012※**	**Extortion Rate 2012**	**Truce Effect**	**Homicide Rate 2012**	**Property Crime Rate 2012※**	**Extortion Rate 2012**
Males	-0.01253	0.00037	-0.00000	0.00020	-0.01432	0.00095	0.00014***	0.00071***
Females	-0.00826	-0.00023	-0.00008***	0.00026	-0.02459	0.00032	-0.00014**	0.00020

All models include the students-per-school ratio for the grade that corresponds to the age of the student, as well as the same set of controls as the models in Tables 3 to 6. Sample weights are used.

※Includes only thefts and robberies. * p<0.1, ** p<0.05, *** p<0.01.