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SOCIAL VIOLENCE AND THE IMPACTS ON EDUCATION IN MIGRANT HOUSEHOLDS

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ABSTRACT

This article discusses the relationship between migration and education in the context of social violence. Migration stimulates development and alleviates poverty by providing money for household human capital investments in the migrant's home country; however, in the context of social violence, the positive effects of migration may be offset or disappear entirely. Using unique data from Santiago de Cali, with one of the highest homicide rates worldwide, we find that living in a migrant household increases the probability of reaching non-compulsory levels of education and completing high school. However, exposure to social violence can mitigate the positive impact of migration on education for children in unsafe and violent neighborhoods.

1. INTRODUCTION

Household income plays a critical role in determining educational outcomes for children (Akee et al., 2010; Grimm, 2011). As migration from developing countries increases, interest in understanding how to channel migrants' earnings toward education has emerged (Ambler et al., 2015). Although some studies suggest that remittances can enhance enrolment by lowering the cost of education (Alcaraz et al., 2012; Edwards & Ureta, 2003; Yang, 2008) this is not universally the case. For instance, local economic conditions can limit the impact of remittances on human capital accumulation (Ghorpade, 2017). Therefore, migration can potentially improve human capital accumulation; however, this is contingent on various economic and social factors that require further investigation.

This article estimates the impact of migration on education outcomes in the context of social violence. We focus on the case of Santiago de Cali, the third-largest city in Colombia that has one of the largest homicide rates in the world (UNODC, 2019). Homicide rates have been consistently high in the Americas for the last three decades, peaking in 2017. By 2021, Colombia had the highest homicide rate in South America (25.7 per 100,000) (UNODC, 2023).[1] This study first explores how migration impacts educational attainment in migrant households, and then we explore the role of social violence in mitigating the positive effects of migration on education.

The New Economics of Labor Migration (NELM) predicts that migrants are driven by the economic aspiration to support their families back home and to improve their socioeconomic position within their communities (Taylor, 1999). However, long-term political instability (i.e., social violence and conflict), and weak institutions can increase the risk of investing in an area and decrease migrant earnings in education and other long-term investments (Fransen & Mazzucato, 2014).

1 These high homicide rates are associated with the presence of criminal groups and their confrontations related to drug trafficking (UNODC, 2023).

This article contributes to several strands of literature. First, we expand on research regarding migration and education outcomes. Unlike much of the literature on migration and human capital investment, we analyze the impact of migration on school attendance and educational attainment in the migrant's home country; with rare exceptions (McKenzie & Rapoport, 2011 in Mexico), most literature focuses only on the former.[2] We estimate the impact on the probability of attending school and reaching and completing higher levels of education (i.e., attainment) for children in migrant households. We find evidence consistent with the NELM investment hypothesis NELM (i.e., migration stimulates development by increasing the likelihood of reaching higher levels of education). These results are consistent with the theoretical and empirical research that indicates migration can alleviate poverty by providing capital for household investment (Catrinescu et al., 2009).

Second, we focus on closing the research gap between conflict and human capital investments by exploring the role of migration and remittances under the context of social violence. Transitional and developing countries, especially weakly institutionalized democracies, are more prone to higher social violence than countries with strong democratic regimes (Fox & Hoelscher, 2012). Furthermore, social violence and conflict have detrimental effects on human capital accumulation in Asia (Justino et al., 2014), Africa (Verwimp & Van Bavel, 2014), and the Americas (Fergusson et al., 2020; Justino et al., 2014; Verwimp & Van Bavel, 2014); however, little is known about the mechanisms. We follow Ghorpade's (2017) hypothesis that conflict exposure affects the reach of remittance investments. We show that migration and remittances can increase the probability of reaching a higher level of education only in safe districts and for children with less exposure to social violence.

Last, our econometric specification may encourage future studies to identify the effect of migration under social violence. We use an instrumental variable approach and exploit several characteristics of Santiago de Cali to construct our instrument and guarantee its validity.[3] We find that households in districts with the most migrants, five years before the survey, are more likely to have a migrant family member or to have received remittances by 2012. Therefore, we estimate an instrumental variable linear probability model (IV-LPM) to compute the impact of living in a migrant household on school attendance. In the case of attainment, we estimate an IV-ordered probit model using a conditional mixed process estimator (Roodman, 2011).[4] The percentages of historical migration are an appropriate instrument for current migration. Establishing migrant networks reduces the cost and risk of future migration,

2 Attainment considers the effects of previous migrations on education (McKenzie & Rapoport, 2011). It captures the effect of migration during the first levels of education, which is essential because the efforts and resources invested in the first years of education affect the likelihood of achieving higher levels.

3 The instrumental variables (IV) method is identified as the next best thing to an RCT when practical considerations inhibit experimental random assignment (Angrist, 2022).

4 This methodology uses a maximum likelihood seemingly unrelated framework that allows estimating an ordered probit model with an endogenous variable.

facilitating new movements (De Haas, 2010). Early migration waves may incur the highest costs; however, as more people migrate, these networks become a form of social capital used to gain employment and other sources of income. To ensure our instrument's validity, we control for income distribution, historical schooling levels, and infrastructure development at the district level during the historical migration period. These variables may influence credit constraints faced by all households and determine previous migration rates and current levels of schooling, which can lead to violations of the exclusion restriction. We also use fixed effects at the 'estrato' level, a sub-division used in Colombia to classify households socio-economically based on household characteristics and environment (urban or rural). Controlling for these fixed effects allows us to consider unobservable household characteristics that do not vary over time and that might affect our exclusion restriction.

The article is structured as follows. Section 2 reviews the extant literature and analyses the relationship between migration and human capital and its effects on children's education. Section 3 describe the model and strategy, and presents the data used in this study, and Section 4 discusses the results of our econometric estimations. Finally, Section 5 provides the conclusions.

2. LITERATURE REVIEW AND BACKGROUND

To understand the effect of remittances on human capital accumulation, we follow NELM, which sees migration as a household strategy to maximize income and minimize risks (Taylor, 1999), including investing in education using earnings from migration.

Edwards and Ureta (2003) explored the relationship between remittances and schooling in El Salvador, noting that migrant earnings expanded household budget constraints, allowing families to invest in children's education. Likewise, Yang (2008) investigated the effect of remittances in the Philippines, addressing methodological concerns about migrant earnings not being randomly allocated and the potential influence of unobserved factors. The author exploits a natural experiment that uses sudden changes in exchange rates due to the 1997 Asian financial crisis to address this potential endogeneity and estimates reduced form specifications that suggest a positive effect of remittances on schooling. Later studies would use similar macroeconomic shocks to identify the effect of remittances using an instrumental variable approach (Alcaraz et al., 2012; Amuedo-Dorantes & Pozo, 2010; Cuadros-Meñaca, 2020). In contrast, McKenzie and Rapoport (2011) found a negative effect of remittances on educational attainment, while Acosta (2011) found no effect on school attendance. The authors argue that migration affects educational outcomes through remittances and parental absence due to migration. This situation may translate into less parental input into education acquisition, affecting the schooling outcomes of members left behind. Similarly, Davis and Brazil (2016) argued that parental migration might require child

labour due to cash shortages. Theoharides (2018) also suggested that similar to the disruptive effect of migration, wage premium changes due to high wage opportunities abroad might influence educational attainment. If children consider working abroad in the future, depending on the qualifications required to work overseas, they may decide on the optimal level of educational investment. These studies suggest that the interaction of an income effect from remittances, a disruptive effect from parental migration, and future work opportunities abroad implies a case-specific impact of migration on schooling outcomes.

On the other hand, international remittances to fragile and conflict-affected areas have increased, and new articles have explored their reach in this context. Ghorpade (2017) found that conflict reduces remittances for wealthier households; however, the poorest receive more for consumption. Regarding human capital accumulation, Fransen and Mazzucato (2014) found no effect on educational attainment in post-conflict Burundi (five years after the official end of the conflict in the country).

Given the lack of evidence on the effect of migration on human capital accumulation in conflict-affected areas, we explore the impact of migration on schooling in Santiago de Cali, a violent city affected by drug cartel violence and the capital city of the main recipient region of international remittances in Colombia. Recent research shows that neighborhood violence has been identified as a detrimental factor in students' performance (Schwartz et al., 2022), and similar effects are found in Santiago de Cali, with more significant impacts on girls (Padilla-Romo & Peluffo, 2023). The authors explain this heterogeneous effect by gender because girls are more likely than boys to show internalizing symptoms, such as depression and anxiety.

The effect of remittances on schooling depends on the income effect and the disruptive effect migration may create for members left behind. Therefore, we start by estimating the impact of remittances on schooling using an instrumental variable approach following the previous literature described above. Once we identify the effect of remittances, we exploit the variation in homicides across districts to understand how social violence impacts them. Unlike Fransen and Mazzucato (2014), we use data when the homicide rate in Santiago de Cali reached the highest level. Now, we introduce the institutional setting for this study, which covers Colombia's migration data and remittance flows, the Colombian educational system, and the country's social violence context.[5]

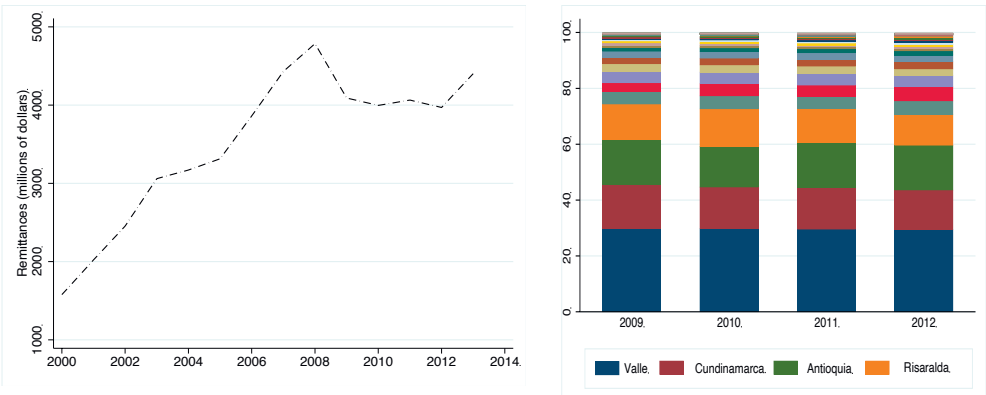
5 While updated information on homicides and migration is available, the data presented here only goes up to 2012, when the survey and estimations were conducted.

2.1. *Migration flows and remittances*

Colombia experienced significant outmigration during the 1990s due to political instability from a prolonged internal armed conflict lasting more than four decades. Furthermore, the price of coffee declined during the 90s, one of the country's leading export products, and an internal financial crisis decreased GDP by more than 4 percent (Ramírez Herrera & Mendoza, 2013). By 2011, over 80 percent of Colombian migrants were in the United States (US), Venezuela, and Spain (World Bank, 2011). Using data from the 2005 Census, Ramírez Herrera et al. (2013) reported that Valle del Cauca (23.1 percent), Bogotá (17.6 percent), and Antioquia (17.7 percent) were the main regions that experienced emigration.

Figure 1. Remittance Flows to Colombia

Panel a. Panel b.



Notes: (Panel a), Remittance Behavior; (Panel b). Main Recipient Regions of Remittances. Source: Data on remittances come from Banco de la República de Colombia.

Migration led to increased international remittances. Figure 1 shows remittance flows to Colombia. According to the Central Bank of Colombia (the institution in charge of monitoring remittance flows), remittance surged by around 200 percent between 2000 and 2008 (Panel A), before the US Financial Crisis and the Great Spanish Depression caused a slowdown. By 2012, remittances had recovered to 3.97 billion USD. Panel B shows that the regions with the highest migrant numbers at the end of the 90s—Valle del Cauca, Bogotá, and Antioquia—received about 60 percent of total remittances. Due to stable international migration, remittances have continuously increased, with the US and Spain as primary sources and Valle del Cauca as the main recipient (Ramírez Herrera et al., 2022).

2.2. Education

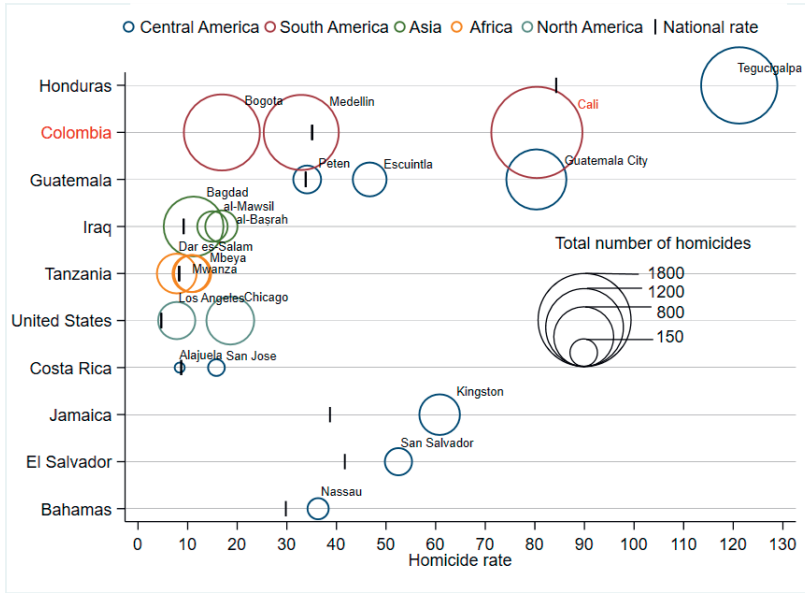
Colombia's education system comprises one year of kindergarten, nine years of basic education, and two to three years of upper-secondary education (Law 115 of 1994). Kindergarten promotes integral development and basic education (five years of primary education, followed by four years of secondary education), preparing students for higher education and social integration. By 2012, these two levels were the only compulsory levels of education. Currently, all levels of education are compulsory. Nonetheless, despite the efforts to increase compulsory levels of education, only 90.6 percent of girls and 81 percent of boys completed lower secondary school. The gender gap 9.6 in the lower secondary completion rate exceeds the Latin America and Caribbean average of 3.9 (World Bank, 2023).

Upper-secondary education is divided into the social service of special education, academic secondary education, and technical secondary education. The first level comprises study programs organized into semi-annual periods, granting a title in arts and crafts that allows access to professional technical institutions of higher education. Academic education focuses on sciences, arts, and humanities, while technical education teaches skills needed in manufacturing and service sectors. Both academic and technical secondary levels include two years of education and grant a diploma that allows access to higher levels of education.

2.3. Social violence

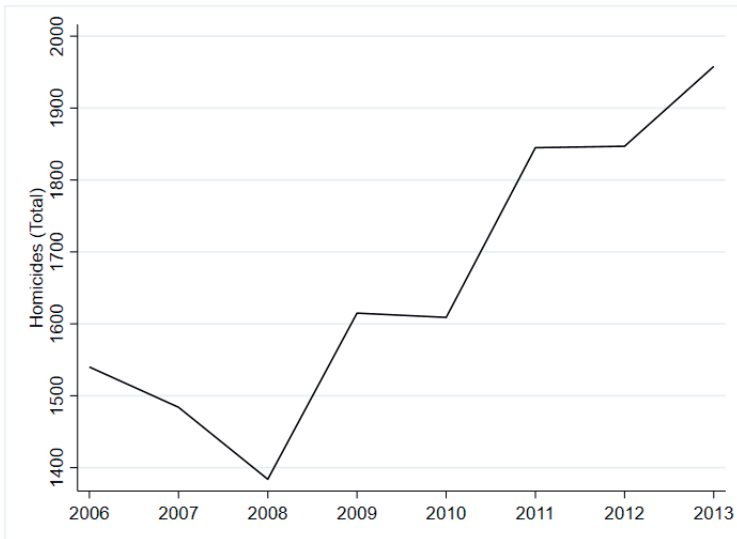
Our study examines the impact of migration on school attendance and educational attainment within the context of social violence. We use data from data from Santiago de Cali, a significant source of Colombian migrants, which had the second-highest homicide rate globally and the highest number of homicides in 2012 (UNODC, 2012) (see Figure 2). Figure 3 shows that homicides in the city increased significantly from 2008, reaching 1,847 homicides by 2012.

Figure 2. Homicide Rate and Number of Homicides by City in 2012



Note: The figure includes cities with population of 100,000 or more. Source: Homicide data are from the United Nations Office on Drugs and Crime (UNODC)

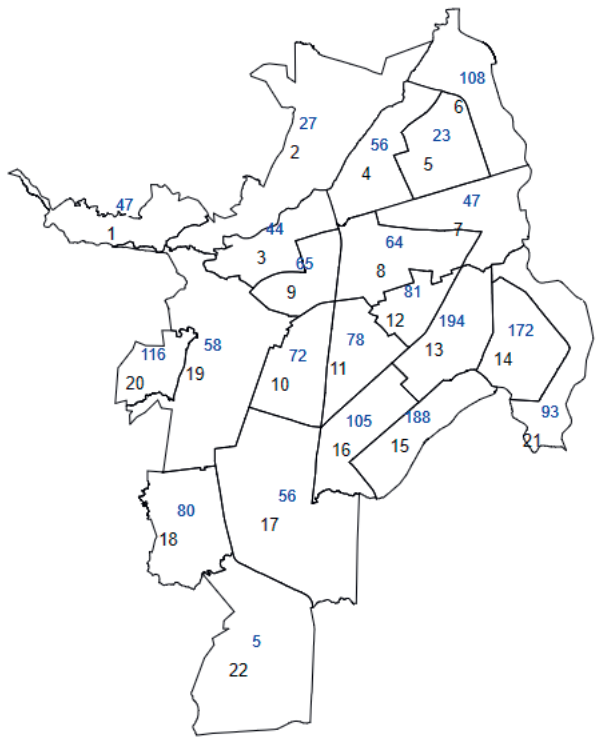
Figure 3. Total Number of Homicides by year at Santiago de Cali



Note: The Figure reports number of homicides. Source: Cali en Cifras 2013.

Santiago de Cali is divided into 22 'comunas' or districts, each comprising several neighborhoods with similar socioeconomic characteristics. Figure 4 shows the distribution of homicides by districts, indicating widespread social violence throughout the city.

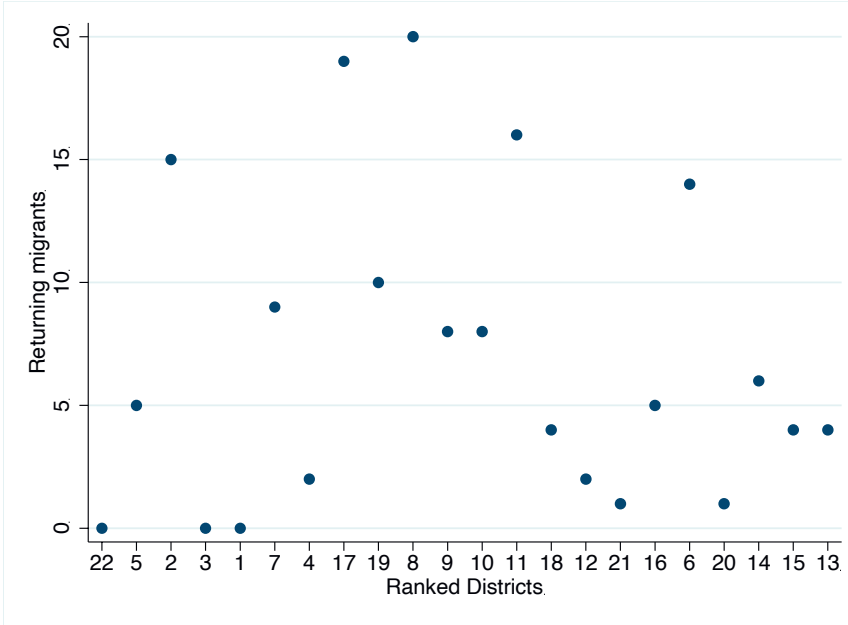
Figure 4. Homicides at Santiago de Cali by districts



Notes: Number of homicides (in blue) by districts (in black). Source: Cali en Cifras 2013.

Regarding migration and social violence, we track households with a returning member in the last five years. Figure 5 plots the relationship between the returning migrants and homicides by district. The X-axis ranks the districts according to the number of homicides from least to highest. We find no pattern in return migration, which suggests no relationship between returning migrants and social violence.

Figure 5. Returning Migrants by District



Notes: The sample includes the number of migrants by district that have returned to Colombia and were overseas 5 years prior to the survey from Encuesta de Empleo y Calidad de Vida (EECV, 2012). The X-axis ranks the districts according to the number of homicides from least to highest. Source: EECV (2012).

Over four million Venezuelans have migrated to Latin America and the Caribbean, with Colombia becoming the primary recipient since 2018 (Mora et al., 2023). Knight and Tribin (2023) found that this migration increased homicides in Colombia, particularly involving Venezuelan victims. Similarly, Mora et al. (2024) found that the unemployment situation for Venezuelan immigrants influenced local crime.

3. METHODOLOGY

This section uses a theoretical framework to explain the effect of migration on educational outcomes. We base our empirical analysis on theories of human capital and educational investment and consider the education production function introduced by Catsiapis (1987), which Salas (2014) adapted to the case of migration and remittances. A household maximizes the following education production function,

$$h = f\left(M, T_p(Mg), T_c;\ H_0\right), \tag{1}$$

Subject to:

$$TC = C_0 + P \times M + W_c \times T_c + W_p \times T_p(Mg) \quad (2)$$

$$TC \leq HB + R(Mg), \quad (3)$$

where TC is the household cost. HB is the household budget, R represents household remittances as a function of a previous migration of a household member (Mg). Household cost also equals basic consumption levels (C_0), the cost of education ($P \times M$), the foregone income of children who attend school, $W_c \times T_c$, and the income of adults who migrated $W_p \times T_p(Mg)$.

The decision to seek higher education depends on market resources, M, the time parents invest in their children, T_p; children's time, T_c, and the initial stock of human capital, H_0. Unlike Salas (2014), we include children's time because it affects their performance and the likelihood of reaching higher levels of education. Inserting the restriction, the Lagrangian can be written as:

$$\mathcal{L} = f(M, T_p(Mg), T_c, H_0) + \lambda \left(HB + R(Mg) - C_0 - P \times M - W_c \times T_c - W_p \times T_p(Mg)\right). \quad (4)$$

From the first-order conditions:

$$\frac{\partial \mathcal{L}}{\partial Mg} = \frac{\partial f}{\partial T_p} \times \frac{\partial T_p}{\partial Mg} + \lambda \left(\frac{\partial R}{\partial Mg} - W_p \times \frac{\partial T_p}{\partial Mg}\right). \quad (5)$$

Equation (5) shows that the impact of remittances depends on whether the income effect offsets the disruptive effects of migration. To find the impact of migration on education, we consider from the first-order conditions that $\frac{\partial f}{\partial T_p} \times \frac{\partial T_p}{\partial Mg}$. This situation represents the disruptive effect of a parent leaving the household on the time they invest in their children. We assume that the time parents invest in their children positively influences achievement. Furthermore, we consider that an increase in migration positively affects remittances, and negatively affects migration. Therefore, from the first-order conditions, the model implies that migration's impact on education is undetermined. The effect depends on whether the income effect of a migrant's earnings offsets the disruptive effect of leaving the children behind and the income that migration implies.

3.1. Empirical strategy

We run the following ordered probit model to estimate the impact of migration on educational attainment:

$$Y_{ih} = \gamma M_h + \mathbf{X_i}\,\beta + \varphi_s + \epsilon_i, \quad (6)$$

where Y_{ih}takes ordered values of attainment by child i from household h. We use information about the number of years of education and the highest level of education reached to create seven ordered categories. These categories include no education, 1–5 years (basic primary), 6 years (completed basic primary), 7–8 years (basic secondary),

9 years (completed basic secondary), 10–11 years (high school), and more than 12 years (completed high school). To estimate the probability of attending school, Y_{ih} takes the value of one when child i attends school. Therefore, when estimating the LPM, γ captures how living in a migrant household, M_h, affects the probability of reaching higher levels of education and attending school.[6]

Vector X_i includes child, household and head of household characteristics that influence education decisions and migration. The first group of variables includes the child's gender and age. Household characteristics include the number of children under 18 in the household. A larger number of children increases the education costs of the household, affecting the probability that children will attend higher, non-compulsory levels of education. Furthermore, we use gender and years of education as head of household characteristics. Households with a woman as household head may allocate resources differently (Rubalcava et al., 2009). A more educated female household head might invest more substantial resources in children's education (Ermisch & Francesconi, 2001; González-Espitia et al., 2014).

The potential endogeneity of migration is a key challenge. Unobservable factors affecting migration and education decisions could bias our results. Therefore, we use an instrumental variable approach, employing historical district-level migration rates as an instrument for being in a migrant household. This approach follows the World Systems Theory and previous studies (McKenzie & Rapoport, 2011; Woodruff & Zenteno, 2007), suggesting that migration networks reduce the costs and risks of migrating. The identifying assumption is that historical district migration affects education outcomes only through its impact on our primary independent variable.

We control for several district-level factors during the historical migration period to mitigate instrument validity concerns. One potential risk to our identification strategy is that the district factors that influence credit constraints faced by all households and that have determined migration rates in the past and current levels of education will bias our results. For example, income distribution may affect migration and education decisions, which we control by including a variable that classifies the average socioeconomic level of the neighborhoods in the districts. This variable takes values from one to six, with six as the highest level. To control for historical education levels that may have been determined by past migration and may influence current levels of education, we include enrolment rates at the district level at primary and secondary levels of education. These two variables are also proxies for historic inequality that may go against our exclusion restriction. Finally, we include the number of primary and secondary schools and the public budget per district to control infrastructure development that could influence the ability to invest in education.

Some concerns regarding unobservable factors remain about the validity of our instrument. Thus, we include fixed effects at the *estrato* level, φ_s. The variable *estrato*

6 LPM provides reasonable estimates of partial effects. As (Wooldridge, 2010, p.563) noted, '[if] the main purpose of estimating a binary response model is to approximate the partial effects of the explanatory variables, averaged across the distribution of x, then LPM often does a very good job.'

divides households by socioeconomic level based on household characteristics and location.[7] These fixed effects help control for unobservable time-invariant variables at levels lower than the district, which may go against our exclusion restriction.

3.2. Data and variables

We use data from the unique household survey EECV (2012), which represented Santiago de Cali's districts. The survey collected the city's labour force indicators and other socioeconomic characteristics to analyse its residents' quality of life. It included 8,600 household interviews in the city's 22 administrative units and rural areas. The survey was conducted between November 2012 and January 2013.[8] We limit our observations to children 10–18 years old because, at 10, children finish primary education and begin leaving school (Sánchez Torres et al., 2016). Our final sample includes 4,247 children: 52 with no education, 2,965 with basic levels of education, and 1,230 enrolled in upper non-compulsory education.

The primary independent variable is whether the child lives in a migrant household, our definition of which has two components. First, the survey asked each household member whether they had resided overseas for some time over the last five years. This definition follows McKenzie & Rapoport (2011), considering the effects of previous migrations on education. It also captures the effect of migration during the first levels of education, which is essential because the efforts and resources invested at this time affect the likelihood of achieving higher levels. The second part of the definition includes households that reported receiving remittances biweekly or monthly as a proxy of a household member residing abroad; the survey does not directly indicate whether household members are living abroad at the moment of the survey.

Table 1. Descriptive Statistics

	Migrant	**Non-migrant**
	(1)	(2)
Age	14.26	14.34
Boy	0.49	0.49
# of members	4.99	4.89
# of members <18 Years old	2.15	1.96
Female household head	0.64	0.38

7 The socio-economic stratification system in Colombia classifies households into six categories numbered 1 (low) to 6 (best conditions).

8 This is the first and only representative survey at the district level for Santiago de Cali. It asks about safety conditions in Cali's neighborhoods.

Years of education household head	8.74	8.51
Observations	200	4,047

Notes: The sample includes children/teens 10-18 years old. Source: EECV (2012).

Table 1 reports descriptive statistics. We divided our sample into migrant and non-migrant households and found an average age of approximately 14 years old. Regarding the head of household characteristics, the average years of education were slightly higher for those migrant households. At the same time, the proportion of women who were the head of household was more significant in migrant households—regarding household characteristics, migrant and non-migrant households had a similar number of children (approximately two), with an average of four total members.

4. RESULTS

4.1. The effect of migration on school attendance and attainment

Table 2 reports our results on the impact of migration on education. Columns 1 and 2 present results from the LPM and probit model, respectively, while Column 3 reports the marginal effects of living in a migrant household on completing high school. In all cases, no evidence suggests that living in a migrant household affects the likelihood of attending a school or the probability of finishing high school.

Columns 4, 5, and 6 in Table 2 present the results from the instrumental variable approach using historical district migration rates as the instrumental variable. The endogeneity of our migration variable is the main challenge in identifying the causal effect of living in a migrant household on education. Column 4 reports the impact on school attendance using a two-step least squares (2SLS) approach. The advantage of estimating a 2SLS LPM is that it facilitates testing the instrument's validity. The Kleinbergen–Paap F-statistic ($F = 18.76$) suggests no concerns about weak instrument bias. Furthermore, households in districts with high historical migration in 2007 were more likely to have a migrant member or receive remittances (first-stage results is available upon request). Given the level of the exogenous variation introduced by the instrumental variable, we cluster all standard errors at the district level. We found no evidence that living in a migrant household affects school attendance.

Table 2. The Impact of Migration on Education

	LPM	Probit	Ordered Probit	IV LPM	IV Probit	IV Ordered Probit
	(1)	(2)	(3)	(4)	(5)	(6)
Children in migrant households	-0.003	-0.024	0.007	0.091	-0.447	0.036
	(0.021)	(0.119)	(0.005)	(0.307)	(1.858)	(0.010)***
Observations	4,247	4,247	4,247	4,247	4,247	4,247

Notes: The sample includes children/teens 10-18 years old. Individual controls include the age and gender of the child. Household-head and household controls include the number of members in the household, the total number of children, the gender and education of the household head, and socio-economic level fixed effects. The district variables include the number of primary and secondary schools in 2007, the enrollment at primary and secondary levels of education in 2007, the average socio-economic level of the district in 2007, and the public budget in 2007 of the districts. The mean of variance inflation factor (VIF) is 3.97 (below 10) in (1). Coefficients are reported with standard errors clustered at the district level in parentheses. */**/***denotes significance at the 10/5/1 percent level. Source: Sample of children/teens from EECV (2012).

Unlike attendance, the impact on educational attainment in Column 6 indicates that living in a migrant household increases the probability of completing high school by 3.6 percentage points, statistically significant at the 1 percent level; in comparison, McKenzie & Rapoport (2011) found that living in a migrant household in Mexico reduces the probability of completing 10–11 years of education by 12 percentage points for boys aged 12–14 and girls aged 15–18. Our study's effect is small but within the range of other causal estimates in the literature.

4.2. Heterogenous effects by gender and age

This subsection discusses the heterogeneous impact of living in a migrant household based on demographic factors, focusing on educational attainment; we estimate the impacts on subgroups by gender and age. We compare whether the impact is more pronounced for boys or girls to determine whether gender influences children's schooling decisions. Furthermore, we consider compulsory education ending at age 15. We report the marginal effects of living in a migrant household on educational attainment, organized into seven school categories.

Table 3. The Heterogeneous Impact of Migration on Schooling (Marginal Effects)

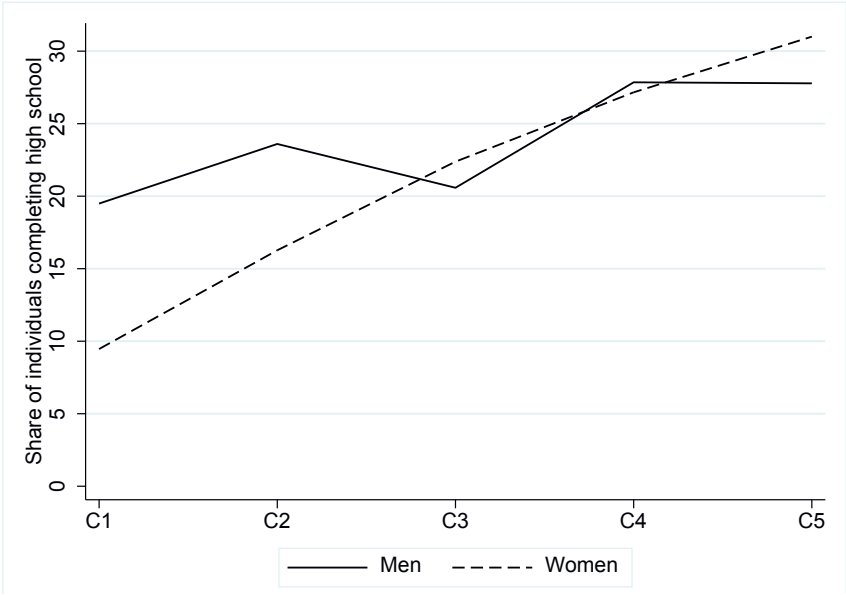
	All	**Gender**		**Children Aged [...]**	
	Children	Boy	Girl	12-14	15-18
	(1)	(2)	(3)	(4)	(5)
Panel A. Attendance					
Child in migrant household	0.091	-0.007	0.333	-0.145	0.409
	(0.307)	(0.295)	(0.543)	(0.121)	(0.649)
Kleibergen-Paap F-stat.	18.76	18.64	8.10	32.35	8.34
Panel B. Attainment					
No schooling	-0.016	-0.015	-0.023	-0.005	-0.025
	(0.004)***	(0.008)*	(0.006)***	(0.000)***	(0.009)***
One to five years	-0.083	-0.076	-0.116	-0.027	-0.095
	(0.022)***	(0.037)**	(0.024)***	(0.001)***	(0.031)***
Six years	-0.014	-0.012	-0.022	0.001	-0.042
	(0.004)***	(0.006)**	(0.005)***	(0.000)***	(0.015)***
Seven to eight years	-0.007	-0.002	-0.017	0.018	-0.133
	(0.002)***	(0.001)	(0.004)***	(0.001)***	(0.033)***
Nine years	0.009	0.010	0.009	0.007	-0.039
	(0.002)***	(0.005)**	(0.002)***	(0.001)***	(0.012)***
10 to 11 years	0.077	0.067	0.112		0.198
	(0.019)***	(0.031)**	(0.024)***		(0.055)***
12 or more years	0.036	0.029	0.057		0.135
	(0.010)***	(0.014)**	(0.014)***		(0.042)***
Observations	4,247	2,066	2,181	2,095	2,152

Notes: The sample includes children/teens 10-18 years old. The controls included are the same as in Table 2. Coefficients are reported with standard errors clustered at the *district* level in parentheses. */**/***denotes significance at the 10/5/1 percent level. Source: Sample of children/teens from EECV (2012).

Column 1 in Table 3 reports the marginal effects for each level using our baseline specification. Living in a migrant household reduces the probability of reaching lower levels of education (no schooling, 1–5 years, 6 years, 7–8 years) and increases the probability of reaching higher levels (9 years, 10–11 years, 12 or more). The most

substantial effect is at the 10–11-year level, which increases the probability of reaching high school by 7.7 percentage points. This outcome suggests that migration may have the capacity to help children reach higher levels of education.

Figure 5. School Attainment by Gender



Notes: Cohorts and shares of individuals completing high school. Source: Sample built by the authors using EECV (2012).

4.2.1. Gender effects

Figure 5 shows that the share of individuals by age cohort (c1–c5) reaching higher education has risen steadily. Furthermore, the gap between men and women who reached this level has inverted, with more women completing high school than men. We explore whether living in a migrant household plays a role in closing the gender gap. Columns 2 and 3 in Table 3 report no impact on school attendance for either gender; however, living in a migrant household reduces the likelihood of reaching lower levels and increases the likelihood of reaching higher levels for both genders. This effect is more significant for girls. The probability that girls will reach high school or complete high school increases by 11.2 and 5.7 percentage points, respectively, while for boys, the increases are 6.7 and 2.9, respectively. The income effect of migration and higher reservation wages for girls may translate into girls benefiting the most from living in a migrant household.

4.2.2. Age effects

We divide our sample into children aged 10–14 (compulsory schooling) and 15–18 (non-compulsory schooling). Furthermore, the Childhood and Adolescence Code (Law 1098 of 2006) states that the minimum age required for workers is 15 years, meaning that children in the first group are not allowed to work. In our sample, 5 percent of children work, and 90 percent are 15–18. Moreover, 41 percent of those who work combine work and study. Columns 4 and 5 in Table 3 report the impact of living in a migrant household on school attendance and the marginal effects of the impact on educational attainment using the IV-ordered probit by age group. For children aged 12–14, the probability of completing secondary basic education increases by less than one percentage point. For those aged 15–18, living in a migrant household increases the probability of completing non-compulsory levels of education by 13.5 percentage points.

These results are consistent with the previous literature in Colombia and Latin America described in Section 2. For example, Cuadros-Menaca and Gaduh (2020) and Cuadros-Menaca et al. (2020) found that child labour and schooling are not perfect substitutes in Colombia. Moreover, while international remittance income reduces child labour, it does not affect school attendance. This finding highlights the importance of government efforts to advertise the benefits of obtaining higher levels of education in their plans for increasing enrolment. Acosta (2011) reported similar findings in El Salvador, where remittance income does not affect the likelihood of attending school.

Table 4. The Impact of Migration on Education Under Social Violence (Marginal Effects)

	All Sample		**In the City Last 4 Years**	
	Neighborhoods			
	Safe	Unsafe	Safe	Unsafe
	(1)	(2)	(3)	(4)
Panel A. Attendance				
Child in migrant household	0.259	0.016	0.070	0.165
	(0.423)	(0.310)	(0.389)	(0.335)
Kleibergen-Paap F-stat.	11.39	13.33	8.53	10.14
Panel B. Attainment				
No education	-0.027	-0.003	-0.027	0.042
	(0.011)**	(0.001)***	(0.013)**	(0.010)***
One to five years	-0.112	-0.018	-0.101	0.234
	(0.034)***	(0.001)***	(0.040)**	(0.039)***

Six years	-0.018	-0.003	-0.017	0.041
	(0.006)***	(0.000)***	(0.008)**	(0.007)***
Seven to eight years	-0.012	-0.001	-0.013	0.017
	(0.004)***	(0.000)***	(0.006)**	(0.003)***
Nine years	0.012	0.002	0.010	-0.024
	(0.004)***	(0.000)***	(0.005)**	(0.005)***
10 to 11 years	0.109	0.016	0.103	-0.196
	(0.033)***	(0.001)***	(0.041)**	(0.031)***
12 or more years	0.049	0.008	0.046	-0.114
	(0.018)***	(0.001)***	(0.022)**	(0.019)***
Observations	1,710	2,537	1,600	2,421

Notes: The sample includes children/teens 10-18 years old. The controls included are the same as in Table 2. Coefficients are reported with standard errors clustered at the *district* level in parentheses. */**/***denotes significance at the 10/5/1 percent level. Source: Sample of children/teens from EECV (2012).

4.3. The effect of migration under social violence

Recent empirical and theoretical research underlines the positive effect of migration on developing economies; however, migrants' economic aspirations and the use of remittances may differ as an income diversification source in the context of social violence (Fransen & Mazzucato, 2014). We define social violence, considering that children can be exposed to social violence directly or indirectly, and create a dummy variable that takes the value of one if the household-head reports living in an unsafe neighborhood. Twenty-five percent of households in unsafe neighborhoods reported one of their household members as a victim of a robbery (compared to 15 percent in safe neighborhoods). Furthermore, around 2.4 percent of households in an unsafe neighborhood reported one household member being killed in the last 12 months. This percentage is less than one percent for households in safe neighborhoods.

The first row in Columns 1 and 2 in Table 4 presents the impact on school attendance by type of household. As before, we find no evidence that living in a migrant household affects school attendance. The Kleinbergen–Paap F-statistic is higher than 10 for households exposed to social violence and those without; therefore, weak instruments are unlikely to bias our results. We also explore the impact on educational attainment, revealing that living in a migrant household increases the probability of higher education levels for both types of households; however, the magnitude of the marginal effects is small for children in unsafe neighborhoods relative to those in safer places. Separately, living in a migrant household in a safe neighborhood increases the probability of completing high school by almost 10.9 percentage points. Comparatively, the increase is 1.6 percentage points for those in unsafe neighborhoods.

We are concerned that some children in our analysis may arrive from other parts of the country and may not have experienced violence in the city. Therefore, in Columns 3 and 4 of Table 4, we analyze the impact of migration on education by type of household for those children who lived in Santiago de Cali during the last four years, when the city experienced a significant increase in homicides (Figure 2). We found that children exposed to an unsafe environment were less likely to reach non-compulsory education levels and complete high school.

In contrast to the lack of impact on attendance, living in a migrant household increases the probability of reaching higher levels of schooling. This outcome means that for households in Colombia, the income effect of remittances offsets the disruptive effect of having a migrant member. Moreover, these results suggest that despite the probability of future migration, children find that reaching higher levels of education translates into better opportunities. This finding is consistent with descriptive evidence showing that Colombian migrants in the US, the primary host country of Colombians, are highly educated (Ramírez Herrera et al., 2022; Ramírez Herrera & Mendoza S., 2013). Moreover, these results highlight that the mechanism through migration affects attainment is heterogeneous among Latin American countries. Unlike McKenzie and Rapoport (2011) who found that migration reduces the likelihood of higher attainment for boys and girls in Mexico, we find that migration provides capital to fund household investment in education.

Our results confirm that exposure to unsafe conditions limited the impact of migration. The results are consistent with the literature on post-conflict areas explored in Section 2. Interestingly, the positive effect of migration only occurs for children who live in safe districts. One potential explanation for these results can be found in the NELM prediction, which suggests that migration and remittances are used primarily as consumption when households are in a turbulent context instead of investments (e.g., schooling). Unfortunately, with the available data, we can only confirm the direct effect of remittances under the context of social violence. Nevertheless, future research could explore how long-term exposure to social violence found in many Latin American cities can lead to a heightened risk for investments in the area, dampening investment-focused remittances. Moreover, future studies can use panel data to explore whether a context of long-term social violence leads many remitters to reconsider their long-term economic interest, leading households in these areas to receive fewer remittances over time and children to lower education levels.

5. CONCLUSIONS

Remittance income has been identified as a determinant of educational outcomes for children (Cortina et al., 2024). Recent trends suggest that these flows to the developing world are one of the few sources of private external finance expected to grow in the coming decade (Ratha et al., 2023), prompting a scholarly debate on the potential of

these funds to boost human capital accumulation. Although these funds can relax household budget constraints, the literature analysed suggests that local economic conditions can limit the reach of these funds. This study focuses on understanding how migration on education impacts education outcomes in the context of social violence.

Our results provide new evidence on the causal impact of migration on education. We show that living in a migrant household in a safe neighborhood increases the probability of completing high school by almost 10.9 percentage points. In contrast, the increase is a 1.6 percentage point for those in unsafe neighbourhoods. Our results are consistent with the NELM investment hypothesis, which underlines migration as a way to relax liquidity constraints and improve investment in families left behind. This result may be particularly true in failing markets, as in our sample. Descriptive evidence indicates that high educational costs and a lack of money are the main reasons for not attending school. Migrants' earnings may allow households to cover educational expenses and allow their children to reach higher education levels. Nevertheless, the small effect on children in unsafe districts indicates the need to implement policies that target reducing violence in the neighborhoods. Safe neighborhoods may motivate investments in human capital and promote economic development.

Finally, this article attempts to provide empirical evidence contributing to closing the gap between the Sustainable Development Goals (SDGs) of the United Nations' 2030 Agenda. The SDG agenda recognizes that decreasing the barriers to accessing education is critical for a healthy society (SDG 4 and 5). Increasing compulsory levels of education and using public programs that target enrolment are initiatives that aim to reach these goals; however, descriptive statistics suggest that public resources are limited and only reach some Colombian children. Our results show that private transfers as a product of migration complement government efforts and allow children to achieve higher education; however, social violence creates conditions that encumber the benefits of living in a migrant household. Our results show that migrant earnings have a limited impact on children in unsafe areas, highlighting the importance of reducing social violence and combating organized crime to guarantee a sustainable society (SDG 16).

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