Not my Problem: The Impact of U.S. Deportation of Criminals on Education in El Salvador

Preliminary and Incomplete, Not for Citation

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1 Introduction

This paper examines the relationship between the expansion of U.S.-based gangs and gender-specific education accumulation in El Salvador. Using data from a time period in which El Salvador experienced growth in gang members of American origin due to a new United States deportation policy, I provide evidence that an increased number of criminals hinders education attainment of boys. While literature studying the impact of violence and conflict on economic outcomes is large and growing, research specifically studying the impact of the expansion of gangs remains relatively unexplored. In general, the existing literature shows that increased levels of violence and conflict hinders education and that girls and boys are impacted differently. Justino et al. (2013) studies the impact of violence caused by the Indonesian invasion of Timor Leste on primary school completion and finds decreased primary school completion for boys and not for girls. The authors argue that boys were more likely to start working when violence grew in Timor Leste. Shemyakina (2011) uses geographical intensity of the 1998 armed conflict in Tajikistan to investigate its impact on gender-specific education attainment. Shemyakina (2011) finds statistically significant decline in education attainment of girls, but not for boys. Concern that girls would face

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harassment by soldiers and militants on their way to school is cited as the explanation. Recent studies have also focused on the impact of drug-related violence on economic outcomes in Mexico (Enamorado et al. (2014), Robels et al. (2013), and Velasquéz (2014)). Brown and Velasquéz (2015) focus on the impact of growing violence in Mexico on education attainment. The preliminary findings are similar to Justino el al. (2013) and suggest that male children exposed to violence have reduced schooling and increased likelihood of working. This paper contributes to the literature by focusing on the expansion of gangs to El Salvador, and thus violence, based on a policy based in the United States. Existing literature currently studies the impact of homegrown conflict and violence, and one of the contributions of this paper lies in the potential exogeneity introduced by American policy directly impacting the expansion of gangs in El Salvador.

The Mara Salvatrucha 13 (MS13), often deemed the "world's most dangerous gang", is believed to have originated in Los Angeles. To escape the nation's civil war, thousands of Salvadorans fled to the United States in the 1980s, and many of them ended up in streets of Los Angeles where Mexican and African American gangs already operated. The illegal immigrants from El Salvador remained in poverty and found the need to protect themselves from the existing Los Angeles gangs and thus formed the Mara Salvatrucha 13 or joined the existing Barrio 18, a rival gang of MS13. By the 1990s, Los Angeles-based gangs grew more powerful and violent with the flourishing drug trafficking market (Lineberger, 2011). In response to the thriving gangs on the streets of Los Angeles, the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) was passed in 1995 (Cruz, 2009). Under the new law, any alien serving a sentence longer than a year could be deported after completing the prison term (Cruz, 2009). As a result, 1996 marked the beginning of a large increase in the number of criminals and gang members extradited from the United States to El Salvador.

Lacking a criminal record within El Salvador, the deportees were released from the police upon arrival (Lineberger, 2011). Freed on the streets of El Salvador, criminals extradited from the United States found a new home and reformed the LA-based gangs across borders

(Lineberger, 2011). While it is clear that the increase in U.S. deportation of criminals starting in 1996 is linked with the expansion of MS13 and Barrio 18 in El Salvador, studies have have yet to analyze the impact of increased number of criminals from abroad and the expansion of U.S.-based gangs on economic outcomes within El Salvador. Given that gangs often recruit adolescents, one would suspect that education attainment of teenagers in El Salvador would suffer. Additionally, since gang membership is majority male (more than 90%), one would expect male education accumulation to disproportionately suffer in El Salvador. This paper provides empirical evidence linking deportation of criminals from the United States to reduced education attainment of boys in El Salvador. The next section introduces trends in education in El Salvador.

2 Education in El Salvador

Education in El Salvador consists of three cycles of basic training consisting of grades one through nine, which is followed by 3 years of secondary training consisting of grades ten through twelve. The ages with their respective grade levels are shown in **Table 1**. Basic training in El Salvador is mandatory. General high school training is three years. Students may alternatively opt for vocational training instead of traditional high school, which is also three years of training.

Table 1: Education System

Age	Target grade
4 - 6	Pre-school
7 - 9	I cycle of basic (1-3)
10 - 12	II cycle of basic (4-5)
13 - 15	III cycle of basic (6-9)
16 - 18	Secondary (10-12)

Figures 1 and **2** depict trends in education within El Salvador. **Figure 1** shows the rate at which male and female children are successfully able to progress to secondary education after finishing basic training. For the time period of the study, a general upward trend

in progression to secondary education can be observed for both males and females. While general education trends are improving in El Salvador, the repetition rates in secondary education are also rising.

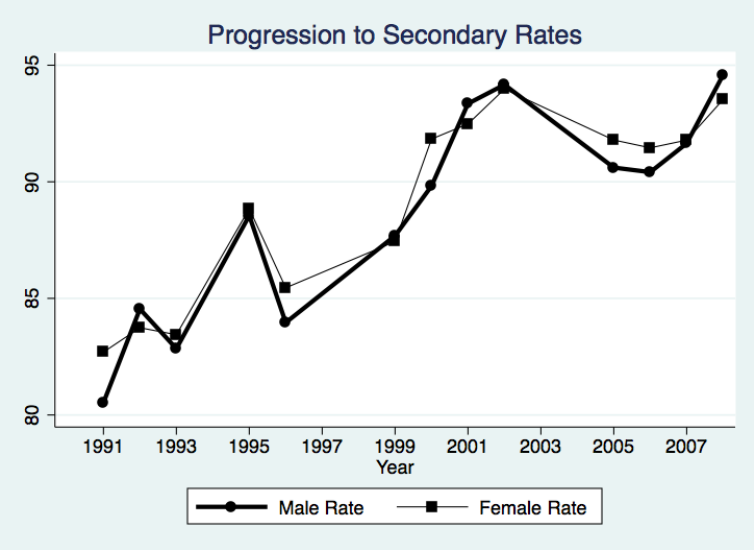

Figure 1: Progression to secondary data are from World Development Indicators. Rates not available for every year.

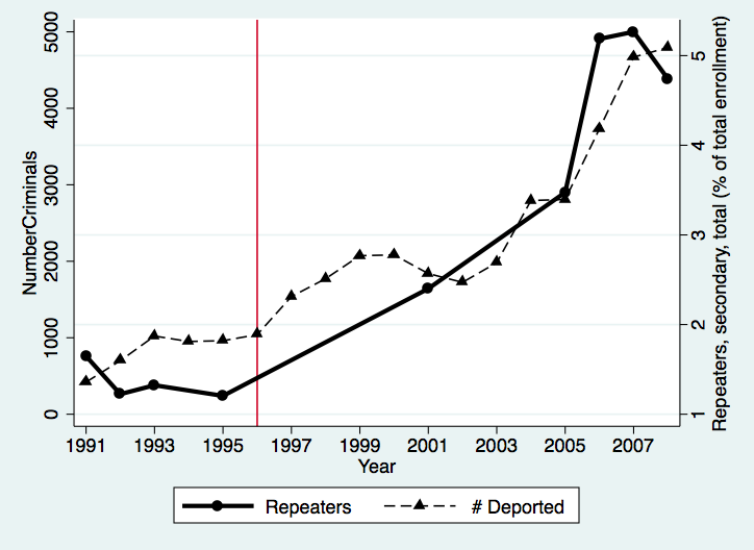

Figure 2: Number of criminal deportees to El Salvador and secondary education repetition rates in El Salvador. Deportation data from Yearbook Statistics of Immigration. Secondary education repetition data are from World Development Indicators. Repetition rates not available for every year.

Figure 2 depicts secondary education repetition rate in El Salvador. Also shown on the graph is the number of criminals deported from the United States to El Salvador over this time period. The graphs shows that the national secondary school repetition remained relatively constant around 1.5% from 1991 and 1996, however this number rises to greater than 5% by 2008. The pattern follows the increased inflow of criminal deportees from the United States. A simple regression estimates that an additional 1000 criminals deported from the Unites States is associated with an increase in the secondary education repetition rate within El Salvador by 1.16%. Given that El Salvador had a secondary education repetition rate around 1.5% prior to an increase in number of criminals from the U.S., this is a large effect. While these yearly trends suggest that the increasing number of deported criminals in El Salvador could be impacting education completion rates in El Salvador, empirical estimation described below provides further evidence.

3 Methodologies

3.1 The Impact of Number of Criminals Deported

The remainder of the paper uses micro-level Salvadoran census data. The two years for which census data are available are 1992 and 2007. The first strategy investigates the impact of number of criminals deported to El Salvador on gender-specific education attainment. The 2007 survey serves as the "post-treatment" year as it follows U.S. immigration policy in 1996 that increased the number of deportees to El Salvador. In **Equation 1**, the dependent variable is years of schooling. Assuming criminals are likely to impact teenagers the most, I investigate the impact of the number of U.S.-based criminals entering El Salvador when the child is 12 on his/her education completion.[1] To do this, I interact *Post* with the number of criminals deported when the child is 12. Because the number of years of schooling completed

[1]Note that this is a cohort analysis. Cohorts exposed to high number of deported criminals at age 12 are compared to cohorts who were twelve years old before the policy change.

is dependent on how old the child is, I include age fixed effects. Where the criminal population settled within El Salvador likely depends on location, thus I also include municipality fixed effects in the model. I also control for whether the household owns, rather than rents, their home as a proxy for family income. Standard errors are clustered at the state (department) level. The sample is limited to children of active school age between 5 and 25. Since changing number of criminals could induce migration within El Salvador, I further restrict the sample to individuals who are currently in the municipality as the municipality of their birth. To ensure that the effects are not driven by the deported criminals themselves, I further limit the sample to individuals who are born in El Salvador and belong to households with no international migrants.

$$Years\ of\ schooling_{imt} = \beta_1(No.\ Deported\ when\ child\ 12_{it} \times Post_t) + \beta_2 Post_t + Age_i \quad (1)$$
$$+Owns\ Property_i + Municipality_m + \epsilon_{imt}$$

Results from estimating **Equation 1** are provided in **Table 2**. The first column estimates the results for both boys and girls. Results indicate that increasing the number of criminals by 1000 in El Salvador when the child is 12 reduces the child's completion of schooling by 0.173 of a year, or by about 2 months. Column 2 restricts the sample to boys, and as suspected the magnitude is larger for boys. The results indicate that increasing the number of deported criminals from the United States by 1000 results in a decreased male completion of schooling by 0.228 of a year, or about 3 months. When the sample is restricted to girls, the effect is much smaller and increasing the number of deported criminals by 1000 decreases completion of schooling by less than 1 month. This serves as a falsification test and helps rule out the possibility that other economic issues within El Salvador, different from the number of criminals deported from the United States, might be driving the effects. If that was the case, one would expect male and female education to be impacted similarly. Also reported

in **Table 2** is a mean effect of increased number of criminal deportees when the child is 12. During the time period studied, it is implied that the increased number of deportees resulted in boys attaining, on average, 0.5 years less of education and girls attaining, on average, 0.15 years less of education.

Table 2: The impact of exposure to deported criminals at age 12 on years of schooling

Dep var:	(1)	(2)	(3)
Years of Schooling	All	Boys	Girls
# Deported Criminals when 12×Post	-0.000173***	-0.000228***	-0.000065***
	(2.52e-05)	(2.80e-05)	(1.51e-05)
Mean Effect	-0.41	-0.55	-0.15
Observations	129,584	71,122	58,462

Standard errors clustered at the state level. All specifications include age fixed effects, municipality-level fixed effects, and a control for whether the household owns the home. Sample restricted to children between ages 5 and 25. Sample restricted to individuals who did not migrate since birth and to families with no international migrants.
*** p<0.01, ** p<0.05, * p<0.1

3.2 Geographical Gang Intensity

In an alternate specification, I exploit geographical variation in gang intensity to estimate the impact of U.S.-based gangs on education. To deduce geographical variation in gang intensity within El Salvador, I make use of a recent truce reached between El Salvador's biggest U.S.-based gangs, Mara Salvatrucha 13 and Barrio 18. In March of 2012, leaders of the two largest gangs in El Salvador instructed their members to stop murdering rival gang members as well as law enforcement members. As an incentive for the truce, gang members were offered assistance finding employment, moved to medium security prisons, and permitted cell phone use. At least, temporarily, the truce led to a steep decline in homicide rates within El Salvador.[2] Since El Salvador has had high homicide rates even before the

[2]The truce has since been broken, and homicides in El Salvador have spiked again.

expansion of US-based gangs, the truce reached in 2012 provides a unique opportunity to disentangle gang-related crime from all other crime in El Salvador. Additionally, the truce was between two gangs of American origin, MS13 and Barrio 18. Hence, I argue that areas exhibiting sharpest decline in homicide rates during the truce-period are those with highest density of U.S.-based gangs.

I assign a municipality as having high U.S.-based gang intensity if it meets two requirements. The first is that the municipality has high homicide rates, above 50 per 100,000, before the truce. The second requirement is that the municipality exhibits greater than 50% decline in homicide rates in 2012. The requirement of relatively high initial homicide rates is important because it prevents coding some smaller municipalities with a single murder in the pre-truce period with zero murders in 2012 as exhibiting a sharp decline in homicide rates. **Figure 3** shows the location of the municipalities with high density of U.S.-based gangs using the method described above. The 2012 truce reveals that gang intensity of U.S.-based gangs was highest in the Western region of El Salvador.

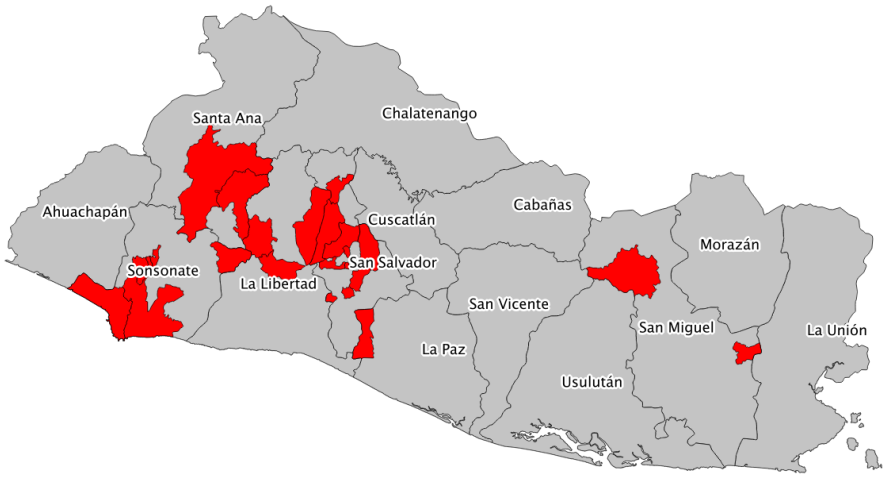

Figure 3: Municipalities with high U.S.-based gang prevalence.

While, education attainment has increased in El Salvador from the first phase of the data in 1992 to the second in 2007, it remains of interest if the areas with high gang intensity ex-

perience less improvement. In my second estimation strategy, I use geographical variation in gang intensity to estimate a difference-in-difference model that compares high-gang-intensity municipalities to low-gang-intensity municipalities, before and after gangs expanded to El Salvador.

$$Y_{imt} = \beta_1(High\ Intensity_m \times Post_t) + \beta_2 Post_t + Age_i \quad (2)$$
$$+Owns\ Property_i + Municipality_m + \epsilon_{imt}$$

Equation 2 estimates the impact of expansion of U.S.-based gangs in El Salvador on schooling outcomes, Y_{imt}. The model regresses education variable of interest (years of schooling or whether the child is currently attending school) on the interaction of high gang prevalence in the child's municipality, *High Intensity*, and whether the child is observed after gangs expanded to El Salvador, *Post*. Main effect of *Post* is also included as well as municipality-level fixed effects. Since municipality fixed effects are perfectly correlated with *High Intensity*, its main effect is not included. I also control for whether the household in which the child resides owns, instead of rents, their home. It is included as a proxy for the household's income, as it is likely that the child's education is strongly dependent on the family's socioeconomic status. The same restrictions on household migration status as **Equation 1** are placed.

Table 3 presents the results from estimating **Equation 2** with years of schooling as a dependent variable. In areas with high U.S.-based gang presence, boys are less likely to complete 0.159 year of schooling, while there is a positive and statistically insignificant effect found for girls. Similarly, **Table 4** presents the results from estimating **Equation 2** with whether child currently attends school as the dependent variable. The coefficient estimate for boys is negative, while the coefficient estimate for girls is positive and statistically significant at the ten percent level. While the estimate for the impact on male attendance rate is not

statistically significant, the decline in male completion of years of schooling shown in **Table 3**, combined with a negative coefficient estimate on likelihood of attendance, suggests that boys in these areas are probably less likely to be currently attending school.

Table 3: The impact of exposure to deported criminals at age 12 on years of schooling

Dep var:	(1)	(2)	(3)
Years of Schooling	All	Boys	Girls
$High\ Intensity_m \times Post_t$	-0.0757***	-0.159**	0.0516
	(0.0238)	(0.0334)	(0.0332)
Observations	190,174	101,038	89,136

Standard errors clustered at the state level. All specifications include age fixed effects, municipality-level fixed effects, and a control for whether the household owns the home. Sample restricted to children between ages 5 and 25. Sample restricted to individuals who did not migrate since birth and to families with no international migrants. *** p<0.01, ** p<0.05, * p<0.1

Table 4: The impact of exposure to deported criminals at age 12 on current attendance

Dep var:	(1)	(2)	(3)
Attending School?	All	Boys	Girls
$High\ Intensity_m \times Post_t$	-0.000250	-0.0149	0.0190*
	(0.00399)	(0.00553)	(0.00573)
Observations	178,977	94,581	84,396

Standard errors clustered at the state level. All specifications include age fixed effects, municipality-level fixed effects, and a control for whether the household owns the home. Sample restricted to children between ages 5 and 25. Sample restricted to individuals who did not migrate since birth and to families with no international migrants. *** p<0.01, ** p<0.05, * p<0.1

The results in **Tables 3** and **4** include a sample of all school-aged children. It remains of interest whether younger children are more susceptible to exposure to gangs. **Figures 4** and **5** graph the coefficient estimates of β_1 interacted with age, and shows the age-specific

effect of increased exposure to U.S.-based gangs. The two graphs tell a similar story. It can be seen that both young girls and young boys between the ages five and nine are less likely to be attending school in areas where U.S.-based gangs are prevalent. This suggests that perhaps parents avoid taking their children to school in gang intensive areas. However as children approach teen-years, girls and boys exhibit a different pattern in their likelihood of attending school. While girls in high-intensity areas catch up in their attendance rates, boys do not. Boys' attendance rates remain low, relative to boys in areas where U.S.-based gangs are less prevalent, until they are sixteen. This graph suggests that boys remain susceptible to gang exposure longer than girls and well into their teenage years.

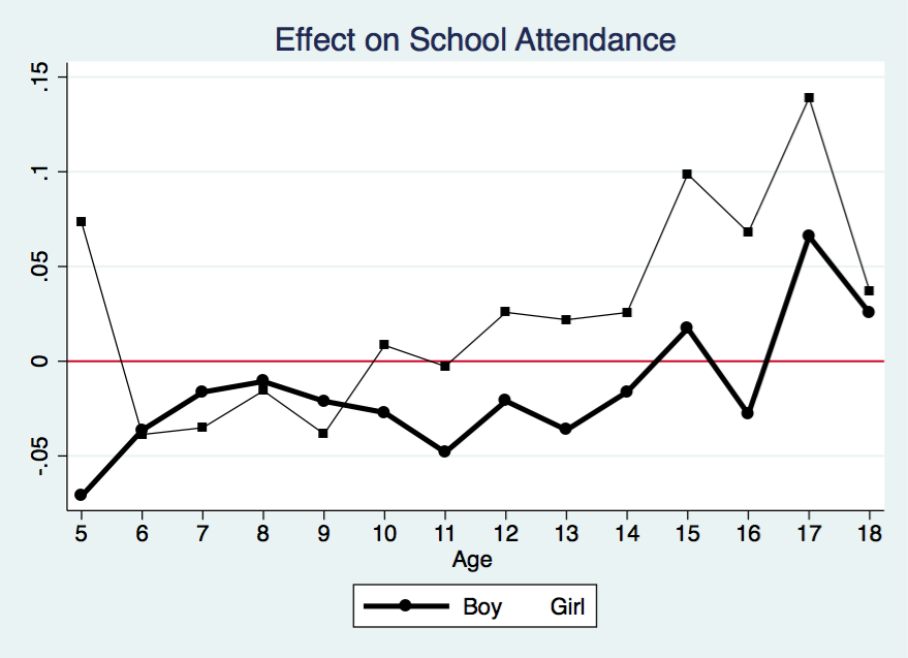

Figure 4: Age-interacted effect of increased gang prevalence on school attendance.

Figure 5 graphs age-specific effects on years of schooling and tells a similar story as **Figure 4**. As expected, lower attendance rates are associated with lower completion of years of schooling for both young girls and young boys. However boys continue to lag behind and by eighteen years of age, boys in areas with high intensity of gangs have completed almost half a year less of schooling than boys in lower intensity areas. On the other hand, girls in high-gang-intensity areas catch up with girls in low-intensity areas in their completed

years of schooling by age fifteen.

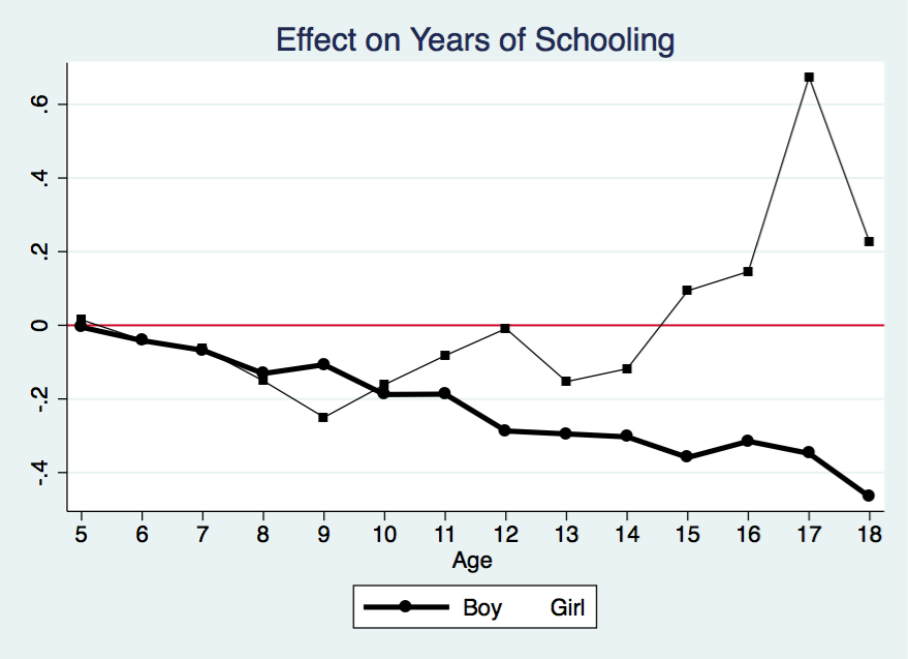

Figure 5: Age-interacted effect of increased gang prevalence on years of schooling.

4 Conclusion and Future Work

Albeit a preliminary study, results suggest that the U.S. policy to increase deportations of criminals, which led to the expansion of U.S.-based gangs, had adverse effects on secondary education in El Salvador. Data from the World Development Indicators reveal a similar patten of increases in number of criminals deported and the secondary education repetition rates in El Salvador. Micro-level census data indicate that years of schooling was also impacted by the number of deported criminals. Micro-level data reveal a pattern consistent with studies in Mexico that male education is impacted adversely, while the impact on female education is more muted. I also take advantage of a recent truce reached between two of the biggest U.S.-based gangs to estimate areas where U.S.-based gangs settled within El Salvador. Using geographical variation in where the U.S.-based gangs settled, I am able to compare education trends between high-gang-intensity areas to low-gang-intensity areas.

My findings suggest that male completion of schooling was hindered in high-gang-intensity area, while female completion is not impacted. Additionally, preliminary findings indicate that families are less likely to send all of their young children to school in high-gang-intensity areas, but as teenagers only boys are less likely to attend school in high-gang-intensity areas.

The current study includes a sample of all children between the ages 5 and 25. However, it is possible that the population of interest is younger children. The study also treats the impact of the deportation policy as being constant for all years of schooling. It is likely that competition rates of schooling in basic education, which is mandatory in El Salvador, and secondary education are very different and thus should be analyzed in separate regressions. In a future draft, I intend to study the impact of basic education and secondary education separately. Previous literature has found that exposure to violence often hinders male education rates, while increasing the male labor participation rates. I also intend to study the impact of the expansion of U.S.-based gangs on gender-specific labor participation rates to investigate if a similar substitution from school to work can be observed for Salvadoran male teenagers.

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