

The Legacy of Civil War: Post-War Schooling Inequality in Guatemala

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Outline

- 1 Introduction
 - Civil War In Guatemala
 - Motivation and Objective
- 2 Post-War Effects on Education
- 3 Pos-War Education Policies
- 4 Empirical Methodology
 - Data
 - Identification Strategy
 - Estimation
- 5 Results
 - Baseline DID Estimation
 - Variation among post-war cohorts
- 6 Conclusions

Civil war: 1960-1996

According to United Nations-sponsored Commission for Historical Clarification (CHC 1999):

- 200,000 individuals lost their lives.
- More than 500,000 people were displaced.
- Many Mayan Villages were completely destroyed:
 - 83 percent of fully identified victims were Mayan, but only around 50 percent of population is Mayan.
- Most of the HRVs were committed by the state against civilian population.
 - 93 percent.

Figure: 1

Annual Number of Killings and Disappearances in Guatemala: 1960-1996

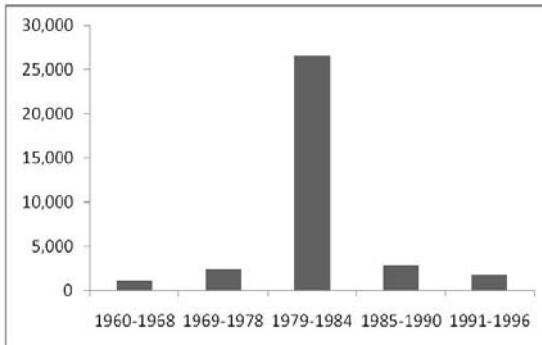
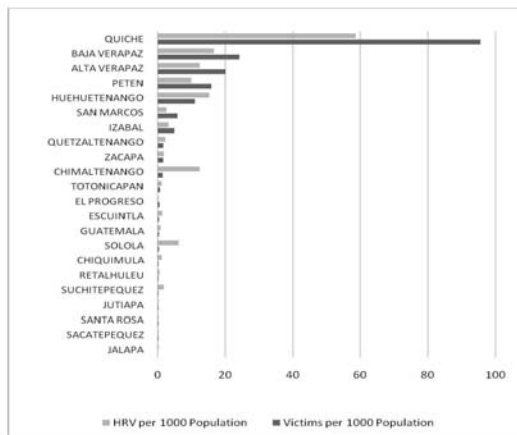


Figure: 2

Number of Victims and Human Rights Violations Per 1000 Population in Departments



Motivation

- The effects of war on civilian population can be devastating and persistent.
 - Empirical literature estimates the microeconomic effects of war on income, poverty, wealth, health, education and labor market outcomes for affected population.

(Alderman et al. 2004, Akresh et al. 2007, 2009, Blattman & Annan 2007, de Walque 2006, Akresh & de Walke 2008, Shemiakina 2006, Chamarbagwala & Moran 2010)

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(Alderman et al. 2004, Akresh et al. 2007, 2009, Blattman & Annan 2007, de Walque 2006, Akresh & de Walke 2008, Shemiakina 2006, Chamarbagwala & Moran 2010)
- Two important reasons why studying the post-war outcomes on education are important:
 - 1 The studies may help in the design and implementation of post-conflict recovery policies by measuring how persistent the effects of civil war are.
 - 2 Wars might have intensified the causes and then it may increase the risk of war reoccurrence.

Objective

In this paper using data from the 2002 National Population Census and the distribution of the number of human rights violations and victims across 22 departments during Guatemala's civil war, we investigate urban-rural, ethnic and gender inequality in primary school outcomes among children who were primary school age between 1997 and 2002.

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 - Lower levels of education, health, nutrition, and lifelong productivity and earnings of individual directly exposed to violence may severely affect education of their children

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 - Lower levels of education, health, nutrition, and lifelong productivity and earnings of individual directly exposed to violence may severely affect education of their children
- School age children in previously war affected regions may have worse education outcomes because those regions may remain without schools, teachers, and infrastructure.
- If post war reconstruction is slow or ineffective, the lagged effects of civil war may be persistent an long-lasting.

Three major policies

These policies were designed to reduce the urban-rural, ethnic and gender gaps in schooling in order to create a more equitable distribution of income and wealth:

- 1 The National-Community-Managed Program for Educational Development (PRONADE): It is disproportionately located in remote rural indigenous communities (earlier 1990s).
16% of Mayan and 4.3% of non-Mayan attended PRONADE in 2000 (McEwan & Trowbridge 2007).

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- 2 Bilingual Schools Program: this program attempt to improve the quality of schooling for non-native Spanish speakers by teaching them Spanish as second language (mid-1980s).
- 3 Scholarship Program for poor indigenous girls (1997):
The primary objective of this program is to keep Mayan girls in school by providing them with financial aid and thereby delay their marriage and reproduction (75000 scholarships in 2003)

Data

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- Children school age and levels in Guatemala:
 - Primary school should be attended by children from 7 to 12 years old (grades 1 to 6).
 - Secondary school should be attended by children from 13 to 15 (grades 7 to 9).
 - High school should be attended by children from 16 to 18 (grades 10 to 12).

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Cohorts Used in Post-War Analysis

Grade	Cohort of Grade-Specific Age In Postwar Period	Age of Oldest Cohort in 1997	Age of Youngest Cohort in 2002
1	1990-1995	7	7
2	1989-1994	8	8
3	1988-1993	9	9
4	1987-1992	10	10
5	1986-1991	11	11
6	1985-1990	12	12

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- 2 There is a lower proportion of children completing each subsequent grade which may be due to a high drop-out rate for all children.
 - Non-Mayan in LWI departments: 87% of children born in 1990 had completed grade 1 or higher in 2002 but only 66% of those born in 1985 had completed grade 6 or higher.
 - Mayans in HWI departments: the corresponding figures are 76% and 32%.

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 - Mayans in HWI departments: the corresponding figures are 76% and 32%.
- 3 There are fairly large gaps between urban and rural sectors, Mayan and non-Mayan children, and boys and girls as well as large disparities between HWI and LWI departments for all post-war cohorts.

Empirical Specification

- Difference-in-difference estimation strategy (Duflo 2001):

$$Y_{ijt} = \alpha + \beta_1 \text{War}_j * \text{Rural}_{ijt} + \beta_2 \text{War}_j * \text{Mayan}_{ijt} + \beta_3 \text{War}_j * \text{Female}_{ijt} + \beta_4 \text{Rural}_{ijt} + \beta_5 \text{Mayan}_{ijt} + \beta_6 \text{Female}_{ijt} + \lambda \text{Teaches}_{jt} + \delta_j + \gamma_t + \varepsilon_{ijt}, \quad (1)$$

- Y_{ijt} : 1 if individual i who currently lives in department j and was born in year t has completed each primary school grade or higher.

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- $Teachers_{jt}$ is the number of teachers in primary schools (public and private) per 100 school age children (7-17 years) in each department in each year.
- δ_j and γ_t are department and year fixed effect to control for unobserved correlation of observations within departments and for a specific birth cohort.

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 - δ_j and γ_t are department and year fixed effect to control for unobserved correlation of observations within departments and for a specific birth cohort.
- Identification problem: three more sets of interaction are included to control for different trends in education and human development across departments for individuals born in each year (1964 Census).

Baseline Estimation

Table: 2

Probability of Completing Primary School Grades for All Post-War Cohorts

Variable	Coeff.	Probability of Completing					
		Grade 1 (1)	Grade 2 (2)	Grade 3 (3)	Grade 4 (4)	Grade 5 (5)	Grade 6 (6)
Panel A: Using Human Rights Violations to Measure War Intensity							
HRV × Rural	β_1	0.0745 (0.0559)	0.0541 (0.0513)	0.0566 (0.0616)	0.0298 (0.0672)	-0.0116 (0.0679)	-0.0493 (0.0721)
HRV × Mayan	β_2	-0.1631*** (0.0525)	-0.1828*** (0.0573)	-0.2201*** (0.0627)	-0.2119*** (0.0665)	-0.2111*** (0.0655)	-0.1929*** (0.0644)
HRV × Female	β_3	-0.0836*** (0.0087)	-0.1015*** (0.0105)	-0.1082*** (0.0118)	-0.1197*** (0.0141)	-0.1279*** (0.0145)	-0.1274*** (0.0164)
Rural	β_4	-0.1183*** (0.0122)	-0.1283*** (0.0129)	-0.1661*** (0.0157)	-0.1942*** (0.0178)	-0.2165*** (0.0192)	-0.2257*** (0.0202)
Mayan	β_5	-0.1080*** (0.0153)	-0.1234*** (0.0172)	-0.1487*** (0.0190)	-0.1654*** (0.0211)	-0.1807*** (0.0225)	-0.1906*** (0.0234)
Female	β_6	-0.0071*** (0.0023)	-0.0071** (0.0028)	-0.0105*** (0.0031)	-0.0193*** (0.0039)	-0.0290*** (0.0039)	-0.0337*** (0.0039)
Sample (Birth Year)		1990-1995	1989-1994	1988-1993	1987-1992	1986-1991	1985-1990
Observations		1,875,605	1,817,665	1,762,325	1,730,759	1,651,011	1,630,186
Log Likelihood		-937,905	-964,707	-999,545	-1,007,373	-957,812	-907,116

Table: 3

Probability of Completing Primary School Grades for Post-War Cohorts – Children of Household Head

Variable	Coeff.	Probability of Completing					
		Grade 1 (1)	Grade 2 (2)	Grade 3 (3)	Grade 4 (4)	Grade 5 (5)	Grade 6 (6)
Panel A: Using Human Rights Violations to Measure War Intensity							
HRV × Rural	β_1	0.0480 (0.0440)	0.0208 (0.0403)	0.0245 (0.0503)	-0.0137 (0.0549)	-0.0544 (0.0568)	-0.0978 (0.0645)
HRV × Mayan	β_2	-0.1538*** (0.0452)	-0.1803*** (0.0494)	-0.2303*** (0.0549)	-0.2224*** (0.0585)	-0.2285*** (0.0576)	-0.2118*** (0.0572)
HRV × Female	β_3	-0.0817*** (0.0094)	-0.1006*** (0.0113)	-0.1090*** (0.0130)	-0.1261*** (0.0155)	-0.1338*** (0.0163)	-0.1354*** (0.0179)
Rural	β_4	-0.0556*** (0.0073)	-0.0571*** (0.0075)	-0.0795*** (0.0097)	-0.1013*** (0.0102)	-0.1188*** (0.0112)	-0.1286*** (0.0112)
Mayan	β_5	-0.0520*** (0.0121)	-0.0621*** (0.0134)	-0.0800*** (0.0140)	-0.0893*** (0.0145)	-0.1009*** (0.0147)	-0.1091*** (0.0142)
Female	β_6	-0.0092*** (0.0021)	-0.0093*** (0.0025)	-0.0127*** (0.0032)	-0.0204*** (0.0047)	-0.0275*** (0.0052)	-0.0258*** (0.0060)
Other Controls:							
HH Head's Schooling		Yes	Yes	Yes	Yes	Yes	Yes
HH Head's Occupation		Yes	Yes	Yes	Yes	Yes	Yes
HH Head's Employment		Yes	Yes	Yes	Yes	Yes	Yes
Sample (Birth Year)		1990-1995	1989-1994	1988-1993	1987-1992	1986-1991	1985-1990

Variation among post-war cohorts

To investigate whether or not the urban-rural, ethnic, and gender gap in HWI departments changes for younger post-war cohorts, we interact the key variables of interest with indicators for each birth year among post-war cohorts:

$$\begin{aligned}
 Y_{ijt} = & \alpha + \sum_{c=1}^6 \beta_{1,c} \text{War}_j * \text{Rural}_{ijt} + \sum_{c=1}^6 \beta_{2,c} \text{War}_j * \text{Mayan}_{ijt} \\
 & + \sum_{c=1}^6 \beta_{3,c} \text{War}_j * \text{Female}_{ijt} + \beta_4 \text{Rural}_{ijt} \\
 & + \beta_5 \text{Mayan}_{ijt} + \beta_6 \text{Female}_{ijt} + \lambda \text{Teachers}_{jt} + \delta_j + \gamma_t + \varepsilon_{ijt},
 \end{aligned} \tag{2}$$

Motivation:

- We expect that post-war recovery should improve over time, education policies effects.
- Each subsequent post-war cohort had the opportunity to attend fewer grades during the war and more grades after the war.

Results of evaluating variation among post-war cohorts

- Similar to the previous results there is an urban-rural gap for all post-war cohorts, but rural post-war cohorts in HWI departments are not more or less likely to complete primary school grades compared to all rural children.
- Compared to all Mayans, those in higher war intensity departments are even less likely to complete each of grades 1 to 6 or higher.
- We find evidence that support our expectation regarding changes in the gender gap in higher war intensity departments over time. The additional disadvantage faced by females in higher war intensity departments is large for alder cohorts for completion all grades, but it decreases dramatically for grades 1 and 2 and becomes zero for grades 3 to 6.

Conclusions

- This paper explores three dimensions of inequality in primary school outcomes in higher war departments during the six years after the end of Guatemala's 36-year-long civil war.

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- Main results:
 - Urban-rural inequality is not different in departments that experienced more violence.
 - Gender differences decrease for younger post-war cohorts in war affected departments.
 - Ethnic disparities remain pronounced and even increase for younger post-war cohorts after the end of the war in HWI departments.

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- Main results:
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 - Gender differences decrease for younger post-war cohorts in war affected departments.
 - Ethnic disparities remain pronounced and even increase for younger post-war cohorts after the end of the war in HWI departments.
- Findings suggest that post-war education policies may have been successful in narrowing the urban-rural and gender gaps in schooling in war affected regions, but ethnic inequalities still existed in HWI departments.

Policy implications

- Compared to other Latin American countries with large indigenous populations, ethnic disparities are largest in Guatemala.

Table: 4

Years of Schooling Among Non-Indigenous and Indigenous People in Latin America

Country	Non-Indigenous	Indigenous	Gap (Years)	Gap (%)
Bolivia	9.6	5.9	3.7	62.71
Ecuador	6.9	4.3	2.6	60.47
Guatemala	5.7	2.5	3.2	128.00
Mexico	7.9	4.6	3.3	71.74
Peru	8.7	6.4	2.3	35.94

Data Sources: Table 6 in Hall & Patrinos (2006) and our own computations.

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- Policy implications: the results presented in this paper imply that narrowing the ethnic gap in education, particularly in parts of the country that experienced a higher intensity of war, should remain a priority Guatemala's education policy.