THE LONG-TERM EDUCATIONAL COST OF WAR: EVIDENCE FROM LANDMINE CONTAMINATION IN CAMBODIA

Ouarda Merrouche

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The Long Term Educational Cost of War: Evidence from Landmine Contamination in Cambodia*

Ouarda Merrouche†

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Abstract

The economic impact of war may be visible in the long run and particularly its impact on human capital. I use unique district level data on landmine contamination intensity in Cambodia combined with individual survey data to evaluate the long run cost of Cambodia's 30 years war (1970-1998) on education levels and earnings. These effects are identified using difference-in-differences (DD) and instrumental variables (IV) estimators. In the DD framework I exploit two sources of variation in an individual's exposure to the conflict: her age in 1970 and landmine contamination intensity in her district of residence. The IV specification uses an indicator of distance to the Thai border-average district fluency in Thai- as an exogenous source of variation in landmine contamination intensity. I show that young individuals who had not yet attended school before 1970 received less education (relative to the older cohort) and this effect was higher in regions where conflict has been more intense. However, immediately after the war there are no visible effects on earnings. I argue that the destruction of physical capital is the major factor that drives down the returns to education in Cambodia post-war. *(JEL O1, O55)*

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†European University Institute and IFAU Uppsala University, RTN network in microdata methods and practice, contact at ouarda.merrouche@iue.it

1 Introduction

War is costly in many dimensions. It destroys human and physical capital, displaces population, creates health and famine crises. The effects of war may be visible in the long run and an important component of the long run impact of war is probably the loss of human capital. War may affect education through several channels: school destructions, reduced physical access to schools, reduction of school inputs. Hence, war may have an impact on both the quality and quantity of education. In turn, war can affect earnings through its effect on education but also through a direct effect of the returns to education by altering the quality of education and/or health outcomes. The long run economic impacts of war remain largely unexplored empirically perhaps due to the lack of data on war damage. In this paper, I exploit a unique district level dataset on the incidence of landmine contamination in Cambodia combined with survey data to provide evidence on the long run human capital cost of war. Cambodia offers an ideal setting for this study for several reasons. First of all, the data were readily available at district level with an administration divided into about 185 districts. Second, following about thirty years of war (1970-1998), Cambodia is one of the most heavily landmine contaminated countries in the World with about one mine planted for each inhabitant. Last, during the Khmer Rouge regime from 1975-1979, the education system was abolished. In particular, schools were closed and teachers subjected to harsh treatment and execution. Although conflict in Cambodia ended in 1998, because it lasted about 30 years it is already possible to evaluate for a cohort of individuals born from 1950-1970 the impact on education levels and subsequent labor market consequences.

The empirical strategy uses the fact that exposure to the war varied by district of residence and date of birth. I use a difference in differences (DD) estimator that controls for systematic variation of education both across districts and across cohorts. If the war caused a serious education setback, the education of individuals who were too young to have been enrolled in school before the war started should be lower than the education of older individuals in all districts, but this difference should be higher in the districts more severely contaminated by land mines. Similar strategies have been used to evaluate the effects of public policies (Duflo (2000) and Pitt et al (1993)). Since conflict was more intense along the Thai border (where most landmines were led) for exogenous reasons, I report instrumental variables (IV) estimates using an indicator of the district of residence distance to the Thai border-average district fluency in Thai-as an instrument for the proportion of the district of residence's land surface contaminated by mines. IV allows to correct for possible bias in DD estimates due to confounding factors or mean reversion.

The results indicate that the young (treated) cohort received less education relative to the old (control) cohort and this negative difference is larger in regions where conflict was more intense. I find no evidence that this resulted in earnings of the treated cohort being lower than earnings of the control cohort. I provide some explanation for why this may be the case.

This paper contributes to a rapidly growing literature on the economic consequences of war in developing countries. In Merrouche (2004) I use district level data from Mozambique to evaluate the economic impact of landmine contamination on income and welfare exploiting exogenous variations in the districts' economies exposure to landmine contamination revealed by the landmine clearance program's priorities. Miguel and Roland (2005) evaluate the long term economic impact of US bombing in Vietnam. However, their results are inconclusive. They do not find a robust negative impact of U.S. bombing on poverty rates, consumption levels, infrastructure, literacy or population density through 2002. Abadie and Gardeazabal (2003) and La Ferrara and Guidolin (2005) use the event study approach to study the relationship between civil war, per capita output and private investment. Finally, Ichino and Winter-Ebmer (2002) evaluate the long run educational cost of World War II. Their findings indicate that Austrian and German individuals who were ten years old during or immediately after the conflict received less education than individuals in other cohorts. Hence, they use a dummy variable "age at the start of the war" to identify the impact of the war which makes it difficult to rule out the possibility that their results reflect confounding factors and omitted variables.

The remainder of the paper is organized as follows. In section I, I provide a brief historical background on Cambodia. In section II, I describe the data. Section III develops the conceptual framework. Section IV describes the empirical strategy. Section V, discusses the results. Section VI concludes the paper.

1.1 The Context

The Cambodian people have experienced war almost continuously for the past 30 years. These years can be roughly divided into five phases: a civil war from1970–1975; the rule of the Khmer Rouge from 1975–1979; the Vietnamese invasion and occupation from 1979–1989; continuing but relatively light civil war from 1989–1993; and infighting among competing political factions from 1993 to 1998. Taken together, these wars, conflicts and political campaigns have claimed no fewer than 2.5 million lives and devastated the country's infrastructure and human capital. Following thirty years of conflict, Cambodia is today one of the most heavily land mined countries (among 80 countries Worldwide) with about six million landmines for ten million inhabitants. Landmines may be considered a serious threat to long-term development and post-war recovery. They adversely affect agricultural development, human capital development and often block access to public infrastructure (roads, schools, power line, water plants, dams). There is a substantial variation across districts in the extent of land mine contamination. Unlike other weapons, mines were extensively deployed around borders by all groups as a weapon of choice to protect territory[1]. While in power from 1975 to 1979, the Khmer Rouge used mines extensively along the borders with Vietnam and Thailand, turning the country into what was called a "prison without walls". Starting in 1985, millions of mines were laid in a 600-kilometer K5 barrier along the Thai border under the notorious K5 conscription program. The K5 (kor pram) barrier was an extensive defence barrier of mines, anti-tank ditches and bamboo fencing, constructed in the north-west by the Vietnamese who invaded Cambodia to put an end to the Khmer rouge regime in 1979. The K5 barrier was intended to act as a barrier against the retreating Khmer Rouge forces. On the other side of the border, Thai military forces laid extensive defensive minefields to prevent infiltration by Vietnamese troops. Minefield location maps were generally not drawn.

The successive conflicts and landmine contamination in particular have been the cause of a dramatic health crisis. Estimates of the number of individuals disabled vary considerably across sources from 1.5 per cent of the population in the 1997 socio-economic survey (2.5 per cent for the sample I consider in this paper) to 15 per cent in Asian Development Bank

[1] Battlefield UXO are found countrywide, and aerial delivered ordnance are found mainly in the eastern and central provinces (US Department of State, 1998:66, Hidden Killers). Also see http://www.yale.edu/cgp/ for details on Khmer Rouge genocide distribution across the country

(1999). 11 per cent of the disabilities are caused directly by landmines alone and another 10 per cent by other war related damages. The figures from the socio-economic survey may be lower than actual disability rates due to under reporting and complex definitions of disability.

During the Khmer Rouge regime 1975-1979, education was dealt a severe setback, and the great strides made in literacy and in education during the two decades following independence were obliterated systematically. The education system was abolished. Schools were closed, and educated people and teachers were subjected to harsh treatment and execution. Often cited figures indicate that out of 20,000 teachers who lived in Cambodia in 1970 only about 5,000 of the teachers remained 10 years later. Various sources report that 90 percent of all teachers were killed under the Khmer Rouge regime. According to the same sources, only 50 of the 725 university instructors, 207 of the 2,300 secondary school teachers, and 2,717 of the 21,311 primary school teachers survived.

2 Conceptual Framework

The potential impact of war damages on human capital can be described using a simple model of endogenous schooling developed in Card (1995) and Duflo (2000) who build on Becker (1967). I assume individuals belong to two cohorts denoted c and 0. Individuals in cohort 0 are assumed to have completed school at the start of the war so their educational choice were not exposed to the damages caused by the war. An individual's utility is $U(y, E) = y - C(E)$, where y denotes the logarithm of the individual wage w with $\ln w = f(E)$. I write the marginal cost of schooling function $C'(E)$ as a linear function of the number of years of education E

$$C'(E) = r_{dc} + \lambda E \tag{1}$$

The optimal level of education is derived by maximizing individuals utility which gives:

$$S_{idc} = \frac{f'(E) - r_{dc}}{\lambda} \tag{2}$$

The cost of education for cohort c living in district d can be written as a linear function of the overall public investment into education denoted I_{dc}.

$$r_{dc} = \alpha_1 I_{dc} \tag{3}$$

I_{dc} may include the number of schools, infrastructure that ameliorate school access (roads, transportation), public spending into teacher salaries, school furniture and so on so forth.

Following Duflo (2000) one can compute the average education level for the exposed and non-exposed cohorts in a given district and obtain the difference between this two averages which can be written linearly as:

$$S_{dc} - S_{d0} = \pi_0 + \pi_1 \left(I_{dc} - I_{d0} \right) + \varepsilon_d \tag{4}$$

This is obtained assuming returns to education are similar across cohorts within district. Another assumption is that the generations not exposed to the war did not anticipate it when choosing the educational level.

The war affects the level of education of the exposed cohort by increasing the cost of education through its negative impact on I. The variation in I between the two cohorts in a given district is a function of the intensity of the conflict in that district. Conflict intensity will be measured by the extent of landmine contamination in a district, LC_d.Hence, I can rewrite equation (4) as:

$$S_{dc} - S_{d0} = \pi_0 + \pi_1' LC_d + \varepsilon_d' \tag{5}$$

The statistical approach will be to estimate this equation. A similar equation can be derived for the difference in the average wage across cohorts assuming earnings are a linear function of education levels.

3 Data

The 1997 Cambodia socio-economic survey is a sample of 6,000 households. I focus on the sub-sample of individuals born between 1950 and 1970. Hence, all individuals in the sample have completed school in 1997. Summary statistics are reported in Table 1. There are 6703 individuals in the sample with an average level of 4.34 years of education. The survey reports data on yearly average monthly earning. Given the earning sample is small relative to the education sample I use the last month earning also reported in the survey when yearly average monthly earning is not reported. This allows me to increase the earning sample from 1852 to 3252 observations. The survey asks for each individual her district of residence. I use this information to match the survey data with the district level measure of war intensity i.e. the proportion of a district surface contaminated by mines. This measure is reported in the Cambodia national level 1 survey (NL1S) provided by the Cambodia Mine Action Center (CMAC) and completed in 2002. Landmine contamination is measured with some error for obvious reasons including the difficulty to identify the areas contaminated in remote places not accessible to the surveyors. Another less obvious source of measurement error is landmine clearance. Between 1992 and 2002 about 20.7 square kilometers of land were cleared (Landmine Monitor Report, 2003). Measurement error leads to downward bias in the estimation of the war effect. However, according to NL1S 4446 square kilometers remained to be cleared in 2002. Endogenous landmine clearance is therefore not a serious concern.

4 Empirical Strategy

In Cambodia children usually attend primary school between 6 and 12 years old and secondary school between 13 and 18 years old. In order to evaluate the education and earning cost of the war I start by comparing the number of years of schooling between individuals fully exposed to the war who were 0 to 6 years old in 1970 (treated cohort) and older individuals (control cohort). If the war had any long term impact on human capital the difference in education level between the treated and control cohort should be larger in regions where conflict was more intense. The corresponding difference-in-differences specification reads as follows:

$$y_{idk} = c_1 + (T_i * LC_d)\,\gamma_1 + \beta_{1k} + \alpha_{1d} + \varepsilon_{idk} \tag{6}$$

where y_{idk} is the outcome of interest (i.e. the number of years of completed education or the logarithm of earnings), T_i is a "treatment dummy" indicating whether individual i belongs to the "young" (or treated) cohort in the sub-sample, c_1 is a constant, β_{1k} is a cohort of birth fixed effect, α_{1d} is a district of residence fixed effect, LC_d is the proportion of district $d's$ surface contaminated by land mines, and ε_{idk} an error term. Note tat this specification may be taken as very conservative since most individuals in the control group had not completed school in 1970. However, most had completed primary education and probably would not have studied further even in the absence of war.

This strategy is valid if there are no other time-varying and region specific effects correlated with the war (and not directly caused by the war). The level of poverty in a district probably determines investments in human capital and may be also correlated with landmine contamination. Given that poverty is auto-correlated (over time), it is unlikely that its effect will differ significantly between the young and old cohort to bias the difference-in-differences estimates. However, in order to correct for other potential confounding factors and mean reversion, I will also use an instrumental variables (IV) estimator. The IV strategy uses the fact that unlike other weapons and war related damages landmines were extensively and disproportionately led along the Thai-Cambodian border due to exogenous events as described in details in section 2.

In other words, proximity to the Thai border can be used as an exogenous source of variation in landmine contamination intensity. The survey asks to each household head her level of fluency in Thai and other languages. From this, I compute the average district fluency in Thai and the average district fluency in Chinese and Vietnamese which I use to control for other border and education externality effects. The Two-Stage-Least-Squares (TSLS) specification reads as follows:

First stage

$$\begin{aligned}(T_i * LC_d) &= c_2 + (T_i * Thai_d)\,\gamma_2 + (T_i * Chinese_d)\,\varphi_2 + (T_i * Vietnamese_d)\,\theta_2 + &(7)\\ &\quad \beta_{2k} + \alpha_{2d} + \upsilon_{idk} &(8)\end{aligned}$$

where $Thai_d$, $Chinese_d, Vietnamese_d$ are respectively the average population fluency in each language in individual i's district of residence. $T_i * Thai_d$ is the excluded instrument in the second stage which reads:

Second stage

$$y_{idk} = c_3 + \left(T_i \widehat{* LC_d}\right)\gamma_3 + (T_i * Chinese_d)\,\varphi_3 + (T_i * Vietnamese_d)\,\theta_3 + \beta_{3k} + \alpha_{3d} + \zeta_{idk} \quad (9)$$

where $T_i \widehat{* LC_d}$ is the predicted value of $T_i * LC_d$ obtained from the first stage.

Table 2 reports first stage estimates for the whole sample and the earning sample. As is clear from the table, the instrument is a very good predicator for landmine contamination intensity. Note that the indicator of language fluency can take value 1 for *fluent in Thai* to 5 for *no knowledge of Thai.* Hence, the coefficients have the expected sign: exposure to the war is higher for people living in districts where the average fluency in Thai is higher and lower for individuals living in districts where fluency in Chinese and Vietnamese is higher.

5 Results

Effect of the War on Education levels and Earnings Table 3 reports OLS and IV estimates of the impact of the war on the number of years of education. I report estimates on the whole sample (column 1 and 4) and the earning sample (column 2 and 5). Both OLS and IV estimates (for both samples) show that individuals in the young cohort received less education and the educational cost of the war is larger in regions where conflict was more intense. The t-statistics is about 1.75 for the IV estimate and OLS estimates are marginally significant. The IV estimate on the whole sample implies that the education loss of an individual in the group most exposed to the war equals 0.817 years of education for each percentage point increase in the measure of war intensity. The suggested (IV) effect at the mean is an education loss of half a year for an individual aged 0 to 6 in 1970 relative to an older individual. For the sample of individuals reporting their earnings the effect is only slightly lower. In terms of sample variation, a one standard deviation variation in landmine contamination intensity above the mean is associated with a loss in the number of years of education of a young individual of about 2.5 years. OLS estimates are much lower than IV estimates which probably indicates a selective placement of landmines and therefore higher conflict intensity in historically more prosperous regions. I have also run separate regressions for men and women and the results indicate no significant effect of the war on women education. This may be due to the fact that given their level of education was initially low (relative to men) they did not have much to loose anyway.

The impact on log earnings using OLS and IV are reported in column 3 and 6 respectively. Both OLS and IV estimates are not statistically different from zero. If the war only affected the quantity of education, this result implies that the rate of return to education immediately after the war is not statistically different from zero for this sample of individuals. For a post-war economy, this result is not surprising and is probably mostly caused by the large loss in physical capital experienced during the thirty years of war including destruction of infrastructure and/or delay in technology adoption. In other words, districts where conflict was more intense are districts where physical capital destructions were more important. Hence, the effect of a fall in education levels (caused by the war) on earnings is compensated by a fall in returns to education caused by physical capital destructions and this due to capital-skill complementarity.

Effect of the War on the Returns to Education Another candidate explanation is the possibility that the war had an impact on the returns to education through affecting education quality or individuals' health. The reduced size and educational attainment of the war cohort could have altered returns to schooling in all cohorts and in particular in the war cohort itself, thereby biasing the estimates (Ichino and Winter-Ebmer (2002). In other words, estimates of the returns to education are biased if the war affects both the quantity and the quality of education. To see this I test whether exposure to the war determines significantly the quality of education as reflected in literacy after controlling for the number of years of education (i.e. the quantity of education). The results derived using a probit model on a dummy for the *"individual is literate or not"* are reported in Table 4. Both OLS and IV estimates are insignificant and small in magnitude. Next, I evaluate the impact of the war on standard measures of school quality through 2005 (pupil over teacher ratio, pupil over class ratio, proportion of school with access to water and toilet) using district level data provided by the Ministry of Education. The OLS specification reads as follows:

$$sq_{dp} = \alpha + \beta LC_d + \gamma_p + \varepsilon_{dp} \tag{10}$$

where sq_{dp} is a measure of school quality for district d in province p and γ_p is a province fixed effect.

The IV specification uses $Thai_d$ as an instrument for LC_d and includes $Chinese_d$ and $Vietnamese_d$ as exogenous controls.

The results are reported in Table 5. Both OLS and IV estimates show no effect of the war on all school quality indicators. The explanations are threefold. First, the war may have had an impact on both the numerators and denominators of these ratios thereby resulting in unchanged ratios. Another explanation is that the education policies adopted after the war were effective in reducing any gap in school quality caused by the war. Without data covering the war period I cannot accurately identify the mechanism behind this result. Thirdly, the effect of war will not be totally identified using land mine contamination intensity as a proxy for all conflicts if for instance land mine contamination is not strongly correlated with crimes and destruction that occurred during the Khmer Rouge regime and particularly those targeting educated people and teachers. Indeed, the crimes committed in 1975-1979 did not disproportionately cluster around the Thai border[2].

Exposure to the war can also affect the returns to education through its impact on health. In particular, a negative health effect of the war may be larger for the older cohorts because they were more likely to be enrolled as soldiers. In the DD framework, a larger negative health effect on the old cohort combined with an equal negative education effect on the young cohort will lead to downward bias of the DD and IV estimates of the rate of return to education. I verify this hypothesis by directly estimating the effect of exposure to the war on health as reflected in an individual's disability and illness status. The results are reported in Table 5 and indicate that if the war had a significant health effect, this effect did not differ significantly statistically between the old and young cohort. Hence, based on these pieces of evidence the effect of the war on the returns to education did not differ significantly between the treated and control group to invalidate the conclusion that the estimate of the returns to education is not statistically different from zero in Cambodia post-war. Next, I discuss the issue of migration selection.

Migration Effect In this type of evaluations, migration introduces a measurement error, which leads to downward bias in the OLS and IV estimation of the war effect. However, endogenous migration could bias estimates of war effects obtained by comparing outcomes according to the individual's district of residence in 1997 rather than the district of birth (Rosenzweig and Wolpin (1988)). Some families might have moved between a child birth and his education to districts less involved in the conflict. This choice might be correlated with other family characteristics which also determine an individual level of education e.g. parents' education. Migration is a problem if for instance more educated individuals in the treated group who lived near the Thai border were more likely to move to regions less exposed

[2] see http://www.yale.edu/cgp/ for details on Khmer Rouge genocide distribution across the country

to the conflict.

This issue could be addressed by matching the indicator of landmine contamination using districts of birth or districts of education rather than districts of residence. However, this information is not contained in the survey. Nonetheless, the survey asks whether people migrated in the five years prior to the survey and reports the district of residence in 1992. Hence, I can check whether my results are significantly altered (and if so in what direction) after correcting for the potential bias due to migration in the five years preceding the end of the war. Note first, that the correlation coefficient is about 0.96 between the level of landmine contamination in the 1992 district of residence and the level of landmine contamination in the 1997 district of residence. About 6.5 per cent of the people in the sample report that they lived in another district in 1992. Further, I re-evaluate the education and wage equations after matching the NL1S and CSES data using the district of residence code in 1992 rather than 1997. The results are reported in Table 6. The estimates are of about the same magnitude as those reported in Table 3. IV estimates are actually larger in absolute terms indicating that migration biases the estimates slightly downward.

6 Conclusion

The war in Cambodia led to a significant education loss for the individuals most exposed to it. However, immediately after the end of the conflict, the effect on earnings is not (yet) visible. The IV estimate implies that the education loss for an individual aged 0 to 6 at the start of the war equals 0.817 years of education for each percentage point increase in the measure of war intensity used (landmine contamination intensity). In terms of sample variation, a one standard deviation variation in landmine contamination intensity above the mean is associated with a fall in the number of years of education of about 2.5 years for an individual aged 0 to 6 in 1970. Since the survey was carried out in 1997, the destruction of the physical capital during the 30 years of war may be the major factor that drives down the returns to education in Cambodia post-war. I find no evidence that this result could reflect the potential impact of the war on the returns to education or migration effects. The evidence provided in this paper contributes to explain why recent studies find lower returns to education in Africa relative to other regions[3].

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[3] See Banerjee and Duflo (2004) for a detailed review.

Table 1--DESCRIPTIVE STATISTICS

	Mean	Standard Deviations
Education	4,34	3,85
Education (sample with valid earnings N=3252)	5,41	4,14
Log(Monthly Earning)	10,45	3,015
Literacy (sample with vaild earnings)	0,023	0,15
Disability (sample with valid earnings)	0,803	0,397
Major Illness last 4 weeks (sample with valid earnings)	0,123	0,329
Proportion of District Surface Landmined	0,69	2,21
Average fluency in Thai in residence district	4,89	0,27

Table 2-INSTRUMENTAL VARIABLES, First Stage

	Dependent Variable: **T*LC**	
	Whole Sample	Earning Sample
T*Thai	-0,7134	-1,004
	(0,102)	(0,125)
T*Vietnamese	1,508	2,024
	(0,162)	(0,212)
T*Chinese	0,754	0,797
	(0,134)	(0,166)
T=1 if Individual aged 0 to 6 in 1970		
LC=Proportion of district surface contaminated by landmines		
Thai: Average district fluenci in Thai		
Observ.	6703	3252

Note: All specifications include year of birth dummies and district dummies.

Standard deviations in parentheses

Table 3--Effect of the War on Education and Earnings

	OLS			IV		
	Education		log(Earnings)	Education		log(Earnings)
	Whole Sample (1)	Earning Sample (2)	(3)	Whole Sample (4)	Earning Sample (5)	(6)
T*C	-0,056	-0,094	0,014	-0,817	-0,769	0,061
	(0,036)	(0,061)	(0,034)	(0,468)	(0,439)	(0,245)
R-squared	0,22	0,25	0,54	0,18	0,22	0,54
Obser.	6703	3252	3252	6703	3252	3252

T=1 if Individual aged 0 to 6 in 1970

LC=Proportion of district surface contaminated by landmines

Note: All specifications include year of birth dummies, district dummies, T*Chinese and T*Vietnamese. Standard deviations in parentheses

Table 4-- RETURNS TO EDUCATION, Marginal Effects Reported

		Probit			IV Probit		
		Literacy*	Disability	Illness	Literacy*	Disability	Illness
		(1)	(2)	(3)	(4)	(5)	(6)
T*LC	Whole sample	-0,02	-0,069	0,011	-0,073	0,001	-0,088
		(0,015)	(0,034)	(0,017)	(0,06)	(0,026)	(0,057)
	Earning sample	-0,024	-0,117	0,042	-0,053	-0,009	0,0067
		(0,025)	(0,073)	(0,028)	(0,042)	(0,019)	(0,071)
Obs. Whole sample		6703	5173	6452	6703	5673	6452
Obs. Earning sample		3148	1847	2882	3148	1847	2882

T=1 if Individual aged 0 to 6 in 1970

LC=Proportion of district surface contaminated by landmines

Note: Sample of Individuals who report earnings. All specifications include year of birth dummies and district dummies.

(*) I control for the number of years of education.

All regressions also control for T*Chinese and T*Vietnamese. Standard deviations in parentheses

Table 5--SCHOOL QUALITY, District Level Estimates

	Pupil/Teacher ratio (1)	Pupil/number classes (2)	Schools with water/Total (3)	Schools with toilet/Total (3)
OLS	1,492	0,142	0,0007	0,008
	(0,644)	(0,015)	(0,007)	(0,006)
IV	2,563	-5,022	-0,137	0,055
	(14,17)	(12,24)	(0,351)	(0,168)
Observ.	111	111	111	111

Note: All specifications include province fixed effects. Standard deviatios in parentheses
All regressions control for average district fluency in Chinese and Vietnamese. Standard deviations in parentheses
The instrumental variable is the average district fluency in Thai.

Table 6: MIGRATION

	OLS			IV		
	Education		log(Earnings)	Education		log(Earnings)
	Whole Sample (1)	Earning Sample (2)	(3)	Whole Sample (4)	Earning Sample (5)	(6)
T*LC	-0,072	-0,115	0,019	-0,95	-1,114	0,054
	(0,039)	(0,063)	(0,035)	(0,293)	(0,307)	(0,164)
Observ.	6703	3252	3252	6703	3252	3252

T=1 if Individual aged 0 to 6 in 1970
LC=Proportion of 1992 district of residence's surface contaminated by landmines
Note: All specifications include year of birth dummies and district dummies.
Standard deviations in parentheses. All regressions also control for T*Chinese and T*Vietnamese