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Gender-Differential Effects of Conflict on Education: The Case of the 1981-1993 Punjab Insurgency

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Abstract: This study explores the long-run effect of the 1981-1993 Punjab Insurgency on the educational attainment of adults who were between ages 6-16 years at the time of the insurgency, using the 2005 India Human Development Survey. We find a substantial and statistically significant negative effect of terrorism on educational attainment. To explore the channels through which the conflict affected education, we use a unique historical dataset on the annual expenditure decisions by farmers in the state of Punjab during 1978-1989. We find a significant reduction in expenditure on education by households with a high ratio of girls to boys and those residing in violence affected districts, which suggests that this reduction was one of the demand-side channels through which conflict affected education.

Key words: India, household expenditure, human capital, conflict

JEL classification: I2, J1, O1

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I. Introduction

Between 2004 and 2008, the terrorist incidents in South Asia accounted for more that 30 percent of all incidents in the world.[1] Internal conflict imposes huge costs not only at the macro-level (e.g. Gates et al., 2012) but also at the level of a household. Apart from the risk of losing life and property, there may also be intra-household distortions to long-term investments due to conflict documented by an extensive literature on the effect of armed conflict shocks on investments in human capital, such as education and health, of children.

Our study makes the following three contributions to the literature. First, we contribute to the literature on the effects of armed conflict on the behavior of households and individuals.[2] We go beyond focusing on the country-level studies and examine the impact of local insurgency within the state of Punjab which has a population of 27 million people (Population Census, 2011). Second, we add to the literature on sex bias in early childhood and the response by farming households to armed conflict shocks by exploring the relationship between shocks, gender composition and educational expenditures. A bias in the allocation of resources towards boys is particularly prevalent in South Asia (e.g. Das Gupta, 1987; Rose, 2001). Third, we find evidence for long-term educational disparity between women and men who were of school-going age in more terrorist prone-districts that is consistent with persistence of effects of negative shocks.

This study explores the gender specific long-run effects of the Punjab insurgency on educational attainment of adults who were between ages 6-16 years at the time of insurgency. We use a unique historical dataset on the daily expenditure decisions by farming households (farm account surveys) for the state of Punjab for 1978-1989. We also use a large scale India Human Development Survey 2005 (2005 IHDS) and combine both datasets with the district level data from the South Asia Terrorism Portal

[1] GTD data 1970-2010: "National Consortium for the Study of Terrorism and Responses to Terrorism (START). (2011). Global Terrorism Database [Data file]. Retrieved from http://www.start.umd.edu/gtd".

[2] Most of research on the impact of armed conflict on investment in human capital has focused on the cases studies using data for the whole country (e.g. Akresh et al. (2011, 2012); Akresh and de Walque (2010); Bundervoet et al. (2009); Justino et al. (2013); Leon (2012); Shemyakina (2011); Swee (2011); Valente (2011)).

(SATP) on terrorist incidents and associated with them killings during the 1981-1993 insurgency in Punjab.

We find a substantial and statistically significant effect of major terrorism incidents and terrorists' killings of civilians on educational attainment by girls. For one standard deviation increase (228.64) in the number of killings due to terrorism and in the number of terrorist incidents (43.21) between 1981 and 1993, young women from the affected cohort attained about 0.69 and 0.60 fewer years of education than comparable women in the districts with no such killings or incidents. These numbers are substantial as on an average, women in Punjab have only 4.83 years of education. Thus, despite the overall educational expansion in Punjab during 1980-1990, women in the districts more affected by insurgency failed to realize these gains to the fullest extent. These results are consistent with findings from earlier studies (e.g. Chamarbagwala and Morán, 2011; Shemyakina, 2011; Walsh, 2000) who observed a lower educational attainment by females in countries affected by civil war and are comparable to the estimated 0.5 years of schooling lost due to landmine contamination in Cambodia (Merrouche, 2011). The negative effect of insurgency is more prominent for the rural locations, which is consistent with the geographic distribution of events that took place during the 1981-1993 insurgency.

To explore channels through which education might have been affected, we analyze the data from household-level farm account surveys conducted by the Punjab's state agricultural department in 1981-1990. The survey period overlapped with the 1981-1993 Punjab Insurgency. We find that one channel through which the insurgency had a negative impact on female education was a decrease in the educational expenses by households that had a greater share of girls to boys of school-going age. This reduction in household expenditure on education was one of the demand-side channels through which conflict affected education. The observed effect is robust to the introduction of additional district and household-level controls, and placebo tests with other types of household expenditure as a dependent variable in separate regressions. To control for factors that remain the same for a district over time (such as, its proximity to the international border and access to religious networks), we control for district fixed effects in all our specifications. Additionally, we also control for factors that may be trending differently

across different districts and may lead to a spurious correlation between increasing terrorism and declining educational expenditures. Examples include differential growth in industrial development (even after controlling for annual per capita income in each district), differential trends in openness to agricultural technologies such as tractors and high-yielding variety seeds as well as for unobservable linear and quadratic trends.

The remainder of the paper is organized as follows. In Section II we relate our study to previous literature and describe the historical context of the insurgency in Punjab. Section III presents the conceptual framework, the data and the estimation strategy. Our baseline results and the robustness checks are presented in Section IV. In Section V we discuss the results and conclude.

II. Prior Literature and Historical Background

II. 1. Literature Review

There is a growing literature on the gender-specific effect of armed conflict on schooling that finds diverse effects. Several studies note that exposure to civil conflict causes a larger negative impact on the enrolment of girls as opposed to boys.[3] Theoretically, however, as recruitment into the army is male-biased, armed conflict can also lower education of boys. For example, using a case-study of Bosnia and Herzegovina, Swee (2009) finds that while all individuals in cohorts affected by war are less likely to complete secondary schooling if they lived in high-intensity areas at the time of the war, the negative effect on schooling is driven by males. Kecmanovic (2012) also finds a lower education among the cohort of males affected by war in Croatia compared to women and older cohorts. She explains this finding by males' participation in the conflict as soldiers. In the context of Uganda, Blattman and Annan (2009) show that school attainment is lower for former male child soldiers, while Annan et al. (2011) observe that abduction had little adverse impact on economic and educational activity of women and explain it by the absence of outside employment opportunities for all women regardless of their involvement in the

[3] Chamarbagwala and Morán (2011) observe this result for El Salvador and Shemyakina (2011) for Tajikistan. Their results are supported by Walsh (2000) who notes that girls in post-war Bosnia and Herzegovina were less likely to finish their schooling than boys.

conflict. Annan et al. (2011) indicate that an important exception to their overall results is the inability of forced mothers to return to school.

Differences in the institutional environments surrounding each conflict may be responsible for differences in the observed impacts of war on education by gender and income level. For example, exposure to genocide in Rwanda resulted in a drop in educational achievement by 0.5 years of schooling for all children. However, the negative impact was larger for boys from non-poor families (most likely Tutsi households), suggesting that this conflict may have reduced educational differences across wealthy and poor households and by gender (Akresh and Walque, 2010). In Nepal, educational attainment of girls who were of school age during the Maoist conflict that aimed to improve the opportunities for underprivileged, actually increased over the education of earlier cohorts and was higher than education of boys (Valente, 2011).

Thus, the overall evidence is mixed. Parents may be more or less willing to invest in a son's secondary education than a daughter's depending on the context of conflict and intensity of recruitment during warfare. There are several channels that may explain higher education of boys vs. girls during conflict. The first channel suggests that parents may prefer investing in education of boys during times of distress more generally, a common pattern in behavior in less developed countries (see review by Duflo, 2012). The second channel points that young girls may be perceived as more vulnerable to attacks and abuses, and in particular, rape, on their way to school and therefore they may have to stay at home for their protection (Education for All, 2011). Third, parents may treat education of sons as an investment and a decline in the household’s expected future income due to conflict may induce them to shift their resources in education of sons (making education of daughters a luxury good). Fourth, households may care more about boys intrinsically relative to girls and this preference may intensify during conflict. Rosenzweig and Schultz (1982) find that children who are expected to be more economically productive adults receive a larger share of family resources.

II. 2. Conflict in Punjab: Background

According to the Population Census (2011), the state of Punjab covers 50,362 square kilometers of land in northwest India and has a population of 27.7 million, roughly 2.3% of the country's total. There are approximately 550 people per square kilometer, and 62.5% of the population lives in rural areas. Punjab has a sex ratio of 893 females per 1,000 males, which is significantly lower than the national average.

On an all India comparison, Punjab ranks sixth in Human Development Index (HDI) but is only 16th based on the Gender Development Index (GDI) making it the Indian state with the highest negative differential between the two (Dikshit et al., 2004).

Punjab is known as the "bread basket" of India. It has an advanced agricultural sector– producing a significant portion of the country's wheat, rice, cotton, and sugar cane, yet importing most of its processed food products (Telford, 1992). After the Green revolution in the 1960s, the state's agricultural output increased significantly, placing Punjab as the state in India with the highest income per capita up until the 1990s (Chandhoke and Priyadarshi, 2005).

Punjab has a history of changing rulers and intense ethnic struggles. It has been ruled by the Turks, the Afghans, the Mughals, the Sikhs, and the British. It became a more democratic, less caste-driven society under Sikh rule in the late 1700s and early 1800s, and expanded its agricultural potential with the introduction of British agricultural technologies in the mid-1800s (Dikshit et al., 2004). These technologies, when applied to Punjab's favorable weather and fertile plains, made this Indian state one of India's most agriculturally developed, and, thus, a key region for the country's economy (Chandhoke and Priyadarshi, 2005). In 1960s, there were tremendous gains in agricultural productivity with the advent of high-yield variety seeds. However, in the late 1960s, Punjab peasant movements escalated towards enormous demonstrations led by the Naxalites (a left-wing political movement) against moneylenders and large landowners. The Naxalite movement in Punjab lost its focus on agricultural reform and peasant social inclusion, and was eventually replaced by Punjab militancy, which arose due to ethnic, religious,

economic, sociopolitical, and historical reasons (Singh, 1987). For a rationalist perspective on the causes of the conflict, see Singh (2008).

The SATP (2012a) traces the beginning of the Punjab conflict to April 13th, 1978, when a group of fundamentalist Sikhs led by Jarnail Singh Bhindranwale attacked and killed several members of the Nirankari sect of Sikhs during their annual convention in the city of Amritsar. Mostly young, fairly educated, economically lower-middle class Sikh militants were responsible for the killing of thousands of civilians in the 1980s and early 1990s. Government military interventions, such as Operation Blue Star and Operation Woodrose in 1984, were unsuccessful and are said to have stirred the conflict to an even greater extent (Singh, 1987). One political leader remarked to Joyce Pettigrew (1995), 'If only we had had the mountains or the sea, we would have had our freedom by now.' For their survival, the militants depended on the support of villagers. Puri et al. (1999), who performed detailed-village surveys, observe that over 65% of the terrorists were from large families of landless laborers, marginal and small farmers and that fighters for "Khalistan" came predominantly for experiencing adventure, making money and also because they were unemployable in the white-collar job market. The rest of the terrorists came primarily from middle-class rural families where landholdings were more than 5 acres. The movement was relatively young, with 68% terrorists being between the ages of 18 and 25. 70% of the terrorists were unmarried. Occasionally, women were also identified as part of the terrorist groups. For example, three women in villages of Majitha were caught carrying messages and arms to terrorists within a group. Many women were also harmed directly by terrorists. During the surveys conducted by Puri et al. respondents in two villages referred to sexual exploits of the "boys" who had made several homes their centers for night stay. "A prominent government doctor in one village provided a generalized picture of young girls brought for termination of pregnancies from surrounding villages every week." The rural households where terrorists forcibly stayed at night were advised to keep almonds as it was believed to be an aphrodisiac. One respondent told the authors, "For the kind of night life they lived, how could they survive without almonds and milk mixed with *desi ghee* (clarified butter)" (Puri et al., 1999: p. 32). Further, Puri et al. note that 12.6% of persons killed by terrorist groups were female.

Interviews of militants by Joyce Pettigrew show that kin and friendship networks were important method of recruitment especially in districts close to the international border, which were also the least developed and most conflict-affected districts in Punjab. These districts were also replete with historical temples that encouraged persistence of religious networks. Proximity to the border also encouraged guerrilla warfare as militants could hide inside Pakistan after carrying out attacks. The continued neglect of this region's industrial development and its above average unemployment (Pettigrew, 1995) lowered opportunity costs of engaging in conflict. However, as we control for district-fixed effects, year effects, district per capita income and district-time trends, these underlying factors may not cause omitted variables bias.

Between 1991 and 1993 strong police action dismantled most of the militant organizations responsible for Punjab's prolonged insurgency resulting in a spike in casualties among terrorists, security personnel and civilians before the violence came to an end in 1993 (SATP, 2012b). The death toll rose over 20,000 by 1993, and even though the conflict has officially ended, there has been sporadic ongoing terrorist activity in the state till date (SATP, 2012b).

III. Conceptual Framework, Data and the Estimation Strategy

III. 1. Conceptual Framework

This section describes a conceptual framework for our empirical analysis. Consider parents deciding on investments that will bring them their future income. Assume that the probability of getting a future income transfer from each of their female is p_g and the probability of an income transfer from each of their male children is p_b.

Now assume that the future income of girls and boys increases through accumulation by them of human capital (through education and health) that households spend on today. If households are hit by a negative income shock due to conflict, they can adopt one of the following three strategies:

1. Cut down on human capital investment for all children and save money for the future

2. Reduce human capital investment for some children and increase (or keep same) the investments in education for other children
3. Increase human capital investment for all children in order to obtain a greater reward from higher wages of their children in the future (as found by de Groot and Göksel, 2011)

All three ways above can be rational approaches to deal with a negative income shock. Future income transfers from girls and boys are a function of their human capital investment, *e* and conflict in the region, *c* which may affect the incomes of boys and girls differently.

$I_g = f(e, c)$

$I_b = g(e, c)$

Suppose parents care about two things only: the probability that at least some of their children transfer income *(p)* and the actual amount of the transfer *(I)*.

If the conflict affects the income transfer functions of boys and girls, parents will need to re-optimize how much investment they choose for boys versus girls. If the conflict shock lowers returns to education for both boys and girls, the couple may decide to cut down on investment for both. Similarly, if exposure to conflict increases returns to human capital for both, the parents may increase investment in education for both girls and boys (depending upon their preferences as well as budget constraints). The direct effect of the shock can for instance, increase wages of women more than wages of men and that may in turn increase expected income transfers from women in which case investment in girls today becomes more likely. However, given the local context in Punjab, it is common for boys to remain with parents post-marriage and for girls to stay with their in-laws and contribute there. In this scenario, a low p_g is likely to have a dampening effect on the change in the educational returns for girls in response to conflict. The probability of the income transfer will also depend on the number of girls to boys in the household. If p_b is greater than p_g as expected, the higher is the number of girls in the household, the more the parents will be able to shift from their educational investment in girls to the investment in boys in response to a conflict shock that affects both transfer functions symmetrically. If the returns to education

become sufficiently higher for girls as compared to boys, the reverse could hold true despite p_b being greater than p_g.

This very simple framework abstracts from fear of getting killed or kidnapped for parents as well as their children, uncertainty about the future returns and also direct utility from getting children educated.

III. 2. Data

In this study we use three main data sources. First, to analyze the long-term impact of the conflict in Punjab on education we use the 2005 India Human Development Survey (IHDS).[4] It is a nationally representative survey of 41,554 households in 1,503 rural and 971 urban areas. The survey questions covered topics of education, health, social capital, fertility and marriage, employment and economic status. In this study we rely on data for the state of Punjab. The descriptive statistics for the sub-sample used in our study are presented in Table 1.

Second, the data on the household expenditure on education comes from the representative repeated cross-sectional farm account survey for the state of Punjab (henceforth, the farm survey). 510 farmers were surveyed between July 1978 and June 1990. 35 farmers were surveyed in 1978 and 46 in 1989 averaging 42.5 households per year. The surveys were conducted by the office of the Economic Advisor for the Government of Punjab. This collection of surveys constitutes an unbalanced panel of 46-sub-districts, where 35-37 and 43-46 sub-districts were surveyed in 1978-1980 and 1981-1990 respectively. Importantly, there was no attrition in sub-districts being chosen after the insurgency began. One household for every sub-district was selected each year based on its representativeness of the sub-district.[5]

The main goal of the survey was to obtain information on the sources of income and types of expenditure of farmers in the state. The survey team selected a farm that was representative of other farms in the area and where a farmer used a bullock pulled cart for tilling the land. The farmer then had to agree

[4] Available from: http://ihds.umd.edu/ (last accessed March 12, 2013)
[5] We are not told exactly how the households are chosen, but there are comparisons between an average farmer's income with that of the district from the Census in Singh (2013).

to participate in the survey and record his day-to-day agricultural activities and family income and expenditures in a supplied journal. Thus, our results are contingent on a farmer agreeing to participate and him being sufficiently educated to keep accurate records. Two government employees were required to visit the farmers once a month to help with the accounting. The journal that registered accounting information was collected by the end of the agricultural year that runs from July to June. Each farmer was paid 75 rupees for filling out the survey. The farm surveys are available until 1990.[6] The descriptive statistics for the sample of farmers can be found in Table 2.

Third, the data on the number of terrorist incidents and killings at the district level come from the South Asia Terrorism Portal (SATP). The data are disaggregated at the district level only for the 'major' incidents, or incidents where three or more people were reported dead.

Thus, all analysis of household expenditure is based on the accounting records made by farmers themselves. The 1978-1989 period can be divided into a pre-violence (1978-1981) and the period characterized by terrorist activity from 1981 to 1989.

Table 2 shows the summary statistics for the households in the dataset. It includes the annual household expenditures on a variety of items, as well as summary statistics on the household composition by age and gender. The data suggest that households spend a large part of their budget on food, which is then followed by social expenditures, expenditure on medicine, travel and education. The average per capita farm income per capita in 1981 is Rs. 4,096 for farmers in the sample. The mean household has about eight members. The household composition is the following: an average household has 0.46 males and 0.38 females of age 5 and below and 2.91 males and 2.80 females age 16 and above. Households have similar numbers of male and female children of school age or 6-16 years old. In our empirical analysis, we focus on household's expenditures on education and health as our main dependent variables as the dataset does not include information on educational attainment and health outcomes.

Table 2 also includes a dummy variable for terrorism that takes the value of one if there was a major incident of terrorism in the district in a year of the survey and is zero otherwise.

[6] This description is based on Singh (2013).

III. 3. Empirical Strategy

3.1 Identification using IHDS data

To identify an individual's exposure to the conflict during their schooling years (age 6 to 16 years), their educational attainment is matched to the district-level exposure to the conflict based on their current district of residence. The baseline specification is presented in Equation 1 which is then augmented by adding district of residence fixed effects and controls for a caste and religious affiliation.

$$(1) \qquad E_{ijk} = (T_j * Affected_k)\gamma + (T_j * Affected_k * Female_i)\delta + (T_j * Female_i)\eta +$$

$$+ Female_i * Affected_k + Female_i + \alpha_j + \beta_k + \varepsilon_{ijk}$$

where the dependent variable E_{ijk} is years of education attained by an individual *i* residing in the district *j* and born in year *k*. α_j is a fixed effect for an individual's district of residence. β_k is a year of birth fixed effect. T_j is the 'exposure' variable that controls for the conflict intensity in the district of residence (number of terrorist incidents or number of people killed). *Affected* is a dummy variable indicating whether an individual *i* was between 6 and 16 years old during the conflict (born in 1965-1984), and is zero for individuals who were born in 1954-1964. We also control for an individual being female. Following the literature and to explore the (potentially) differential impact of terrorism events on the education of women, we also include in the equation an interaction of 'female' with the 'affected cohort' dummy. To test for the differential impact of the conflict exposure on boys versus girls over and above the gender-differential effect on education overall, we add to the regressions an interaction term between the conflict variable and the female dummy. The triple interaction term between the "Affected cohort", the female dummy and the measure of terrorist activity in the woman's district of residence gives us the estimate for the gender-differential impact of terrorism on educational attainment for affected cohorts after accounting for cohort, gender and conflict effects individually and their interactions. The individual level controls include gender, caste/ religion[7] and rural residence.[8] All regressions are estimated with

[7] We include the following dummy variables representing caste and religious affiliation in the regressions: Brahmin, High Caste, Sikh, other Backward Caste (OBC) and 'other' affiliation used as a reference group that includes members of Dalit caste, Christian, Muslim and Adivasi.

robust standard errors clustered at the district of residence. We also separately estimate regressions for rural locations as most of the terrorist activity happened in rural settings.

3.2 Identification using the farm accounts surveys

Next, we explore the household-level channels through which the conflict may have affected education using the following empirical specification (2):

(2)

$$\text{Household expenditure}_{ijt} = \alpha + \beta\,(\text{Terrorism})_{jt-1} + \text{ratio6\_16}_{ij} + (\text{ratio6\_16}*\text{Terrorism})_{ijt-1} + (\text{Year-fixed effects})_t + (\text{District-fixed effects})_j + (\text{District-time trends})_{jt} + (\text{District-quadratic trends})_{jt} + (\text{District-per capita income})_{jt} + (\text{Rainfall from nearest weather station})_{ijt} + (\text{Household-level controls})_{ijt} + \varepsilon_{ijt}$$

where i, j and t subscripts refer to household, district and year respectively. The dependent variable is household expenditure is annual household expenditure on education or medicine. Terrorism is a dummy variable equal to one if a major terrorist attack took place in that district and zero otherwise. A major terrorist attack is defined by SATP as an attack that caused at least three casualties.

As the data on casualties are based on a calendar year and that of expenditures on an agricultural year (July-June), we have a six-month gap between the casualties' data and other variables in the specification instead of the conventional one year (similar to the approach in Singh, 2013).

The variable ratio6_16 is defined as the [number of females in the household between ages 6 and 16 / (1+number of males in the household between ages 6 and 16 years)].[9] We also include a set of dummy variables for each year following the onset of conflict (1981 onwards) and the district-level fixed effects (12 districts). Other controls include information on rainfall from the nearest weather station (in mm) that was recorded for all farming households in the dataset. Household-level controls include area

[8] The data do not include information on the household of residence during one's schooling years.
[9] This specification of the denominator allows us to keep in the regression sample households that do not have boys.

held in hectares, area under each quality of soil (Sandy, Clay, Loam, Sandy Loam) and the number of adult family members. District-time trends and district-quadratic trends control for linear and quadratic trends in unobservable characteristics that may be specific to each district, for example, agricultural productivity. The robust standard errors (ε_{ijt}) are clustered at the village level.

The gender differential estimate of the impact of terrorism on educational expenditure can be inferred by the coefficient on the interaction between the Terrorism dummy and the gender ratio of the school-age going cohort in the household. This interpretation assumes that migration patterns in response to conflict do not cause a selection bias. For example, if families with a high ratio of girls to boys are the only ones that are remaining in the districts prone to terrorism because they are unable to migrate, we are going to have a bias in our estimates. To address this concern, we show that ratio of girls to boys of ages 6-16 years remains similar over time in our sample for both high-terrorism affected as well as low-terrorism affected districts (see Appendix Figure 1). However, there is no data available on migration during this period, so we are unable to control for it in our regressions. Similarly, we do not find a reaction to the conflict in fertility and possible abortion decisions of the household in our sample. There does not appear to be a difference in patterns for under-6 girls to boys' ratios both within and between districts (see Appendix Figure 2).

IV. Results

IV. 1. Results from the 2005 IHDS

In the analysis of the IHDS data, we use two variables to control for the district level exposure to terrorism. The first variable is the number of major terrorist incidents (with more than three people killed) recorded for the district between 1981 and 1993. The second variable is the number of people killed in the district due to the major terrorism incidents during the same period.

We use the following definitions of the cohort affected by conflict during its formative years, henceforth the 'affected cohort'. First to match the expenditure data for children aged 6 to 16 years in the farmers' survey that ended in 1989, the 'affected cohort' includes individuals who were 6-16 years old

during the insurgency or born during the period 1965-84. Second, to match the years of insurgency more precisely, we extend the definition of the affected cohort by including individuals born in 1965-1987.[10] In Tables 3 and 4 we present estimation results for the full sample, and in Tables 5 and 6 we focus on the rural sub-sample, as reports on the conflict suggests that insurgent activity took place primary in rural locations. Tables 3 and 5 use the number of terrorist incidents reported between 1981 and 1993 and Tables 4 and 6 use the number of deaths associated with these terrorist incidents as district-level measures of exposure to conflict.

The estimates in Tables 3 and 4 suggest that district-level exposure to conflict had a negative and statistically significant impact on the educational attainment by females who were age 6-16 during the Punjab insurgency (the triple interaction term) after controlling for other variables as explained above. This result is robust to alternative definitions of the treatment group as discussed above. It is more pronounced for rural locations that experienced a greater amount of conflict during these years (Tables 5 and 6). The estimated coefficient on the stand-alone 'conflict exposure' variable is statistically significant at least at the 1% level in most of the estimations, suggesting that individuals in the 'affected' cohort in the districts with more conflict attained fewer years of education.

The estimated coefficient on the triple interaction term, between 'affected cohort', 'conflict exposure' and the estimated coefficient on the indicator variable for female is negative and statistically significantly different from zero at the 1% level in the estimations on the full and the rural samples. The coefficient is larger in absolute value when we use ‘number of terrorist cases’ as a measure of exposure to conflict compared to the number of killings, 0.014 vs. 0.003 respectively for the full sample. Thus, for one standard deviation increase in the number (43.21 cases) of incidents and killings (228.64 deaths) between 1981 and 1993, women from the affected cohort attained about 0.60 and 0.69 fewer years of education than women in the lesser affected districts respectively, which amounts to more than 10 percentage points decline as on average, women in Punjab had 4.83 years of education.

[10] We also used an alternative definition of the control group that included individuals who reached age 16 before 1981 or those born in 1964 and before. Using this definition did not have a substantial impact on the estimates in Tables 3-6.

The estimated coefficient on the interaction term between ‘conflict exposure’ and ‘affected cohort’ dummy is positive and rather small. In the full sample estimations, it is statistically significantly different from zero only when regressions also control for an individual's caste (religion) and district of residence. The positive sign indicates that men in the districts more exposed to conflict attained more education. This effect is not present for the rural sub-sample, where the estimated coefficient on the interaction term between ‘conflict exposure’ and ‘affected cohort’ is not statistically significantly different from zero (Tables 5 and 6). The estimated coefficient on the interaction between ‘female’ and ‘affected cohort’ dummies is positive and statistically significant at the 1% level. The estimates vary between 1.5 and 2.1 depending on the set of controls and sub-sample used, indicating that women from the 'affected cohort' obtained 1.5 to 2.1 more years of education than women from the control group born in 1954-1964, who should have completed their schooling by the time of the Insurgency. This last result indicates a significant gain in female education for the 'affected cohort' in 1980-1990s. However, the estimated coefficient on the triple interaction term is negative and statistically significant. Therefore, even during this educational expansion for the younger cohort and women in particular, exposure to conflict during one's schooling years had a negative and lasting effect on the educational attainment of women.

We should note that our results are robust to using two alternative specifications of the conflict exposure variable (number of incidents used in Tables 3 and 5 and number of killings used in Tables 4 and 6), the alternative specification of the 'affected cohort' (columns 1-4 vs. columns 5-8 in Tables 3-6) and controlling for the year of birth, district of residence and caste/religious affiliation fixed effects.

IV. 2. Results from the survey of farmers

Table 7, Columns (1)-(4) present estimation results of equation 3. The dependent variable is the amount spent by a household on education. The main variable of interest is the interaction of the ratio of girls to 1+boys aged 6-16 years in a household interacted with the dummy for the district being exposed to a major terrorism event in the survey year. SATP defines a major terrorist incident as one where there are at least three killings by terrorists. The estimated coefficient on the interaction term is negative,

suggesting that households that have a greater share of girls than boys of the school going age and who reside in districts that experienced a major terrorism event spent less on education than comparable households in the districts that did not experience a major terrorism event. The estimated coefficients on the stand-alone 'terrorism' dummy variable and the share of girls to boys are both positive but not statistically significantly different from zero in Column (4). The weak statistical significance of the regression coefficient estimated on the dummy for terrorism in Columns (1)-(3) implies that for families that have no girls of school-going age, there is an increase in the expenditure on education for boys. This effect may be related to an increase in the returns to education of boys relative to girls as explained in the conceptual framework. As the number of girls in the household increases, so does the likelihood of substitution towards boys' educational investment.

In Table 7, Columns (5)-(8) show the results of the same set of regressions but with household expenditure on medicine and doctors' fees being a dependent variable. Again, the estimated coefficient on the interaction term is negative and statistically significantly different from zero at the 10 percent level. Further, it can be seen that the presence of terrorism has no statistically significantly different impact on the expenditures on health for a household with no school-age going girls. The relative share of girls to boys is correlated positively with the health expenses in peaceful districts. This result is statistically significant when we control for more than district and year fixed effects, as in Columns (7) and (8). Again, the estimated coefficient on the interaction term is negative and statistically significant which shows that households with a higher share of girls to boys in the districts affected by terrorism significantly reduced their expenditure on medicine.

Figure 2 shows that expenditures on both education and health behave similarly in peace and conflict as the number of girls increase relative to number of boys in a household. In the years, when a district experienced no major terrorist incident, the expenditures on both items show a slightly increasing trend suggesting perhaps that there is little gender inequality in the household expenditures during peace. However, during a year when a district faces a major terrorist incident, in the households with the higher number of girls relative to boys the expenditures decline. This observation indicates the re-optimization of

a household's human capital investments in response to a conflict shock, and this re-allocation appears to be favorable towards boys.

In Table 8, we conduct a placebo check where we test for the impact on educational expenditure using the ratio of female to male children six years and younger (Panel A; columns 1-4) and the ratio of adults age 17 and above (Panel B; columns 5-8) and their interactions with the "terrorism" dummy as independent variables. The results show that expenditures on education and medicine are significantly negatively associated with the presence of terrorism only in the households that have relatively high ratios of girls to boys of school-going age and not of other age groups. Appendix Table 2 shows the placebo test for health expenses with the gender ratios for other age groups. Similarly to Table 8, these results do not support differential allocation of health expenditure towards boys or girls in the districts significantly impacted by terrorism. As an additional robustness check, we replace the ratio of girls to boys by the actual numbers of girls and boys of school age in a household, along with their interactions with the terrorism dummy in Table 9. The results point towards a significant negative effect on educational expenditure in terrorism-affected district-years for households that have girls. In terms of magnitude, the effect is equivalent to a reduction of about Rs. 100 per girl per year in the household for a terrorism affected district. This amounts to a reduction of 22% on average educational expenditure for every additional school-age going girl in the household.

We conduct another robustness check by estimating whether households with a higher ratio of girls to boys also reduced their other types of expenditure. If we observe cutbacks across the board, it would mean that households are trying to conserve resources overall. Few present these results in Table 10, where we use the same model specification as in Table 7, but replace the dependent variable with other types of expenditure, such as expenditure on food, social, religion, lighting and travelling. We find no statistically significant impacts of on these types of expenditure for households that have a higher proportion of girls versus boys of school going age in the districts affected by terrorism. Interestingly, the regressions indicate that households in the districts affected by terrorism reduce their expenditure on travelling (the estimated coefficient in Column (5) is statistically significant at the 5% level). This result

is consistent with the likely decrease in safety in affected districts. All regressions control for district and year fixed effects as well as district linear and quadratic trends and other household-level and district-level controls.

In Table 11, we replace the ratio of girls to boys for ages 6-16 with two ratios – for children aged 6-12 and these aged 13-16. The results in Table 11 indicate that there are no significant heterogeneous gender differential effects on the health and education expenditures between the younger school-aged children, characterized as being in the 6-12 age group, and the older students, the ones in the 13-16 age group, as all the terms are not statistically significant. This result suggests that insecurity of teenage girls (due to a possibility of sexual abuse) was not the only reason. However, this result could also be due to a low power, as sample size is curtailed.

In Appendix Table 1, we perform a mechanism test, where we estimate regression models from Table 7, for the sub-samples of households that have only girls, only boys and both boys and girls. The results for educational expenditure are shown in Columns (1)-(3). The regression results in this table combined with the regression results in Table 7, suggest and reinforce a substitution story – when there is a mix of boys and girls in the household as in Column (3), district-level exposure to terrorism has an insignificant but large negative effect on educational expenditures (-16.6%) but the magnitude of the effect is only 1% when the household has only girls. These results have a low power due to a decline in observations when we take the sub-sample but point towards a substitution story rather than a secular cut in educational spending for all children in a household that has only girls. Similarly, they also suggest that educational expenditure for boys did not decline (and might even have gone up) in all-boys households. Overall, the results indicate that terrorism interacts with household gender composition of school-age children by reducing educational and health expenditures especially where there are more girls in households that have both boys and girls. This result is also in line with triple difference estimates of the impact of conflict on long-term educational attainment obtained through the IHDS 2005.

The external validity of our results is contingent on the sample of the farmers being representative for the area studied and not being affected by the outmigration of Hindus due to an increase in violence towards them during the years of the insurgency. There may also be a tendency to over-report educational expenditure in families with many girls, so we expect our estimates to be a lower bound of actual investments in education. Further, the accuracy of results using the 2005 IHDS depend on an individual surviving up to 2005 and not migrating outside one's district of residence at the time of schooling.

V. Discussion and Conclusion

This study contributes to the literature on the long-term effects of armed conflict on education using a case of the Punjab insurgency. We find that women who were of school age during the insurgency and who live in districts that experienced a greater number of terrorist incidents and associated with them killings lost about 0.60 to 0.69 years of schooling compared to women of similar age who lived in the districts that did not experience conflict. Using data collected during the Insurgency, we find that households' expenditure on education in the districts affected by conflict decreased but only for households that had relatively higher ratio of girls to boys. This result suggests that reduction in household expenditure on education was one of the channels through which a shock imposed by the conflict hindered accumulation of human capital by women.

Human capital is an important determinant of economic growth especially for countries that have lower levels of education to begin with (Krueger and Lindahl, 2001). It is also one of the factors used by the United Nations to measure human development. Educational attainment by gender enters the gender equality indices. However, there is limited evidence of how human capital is affected by local insurgent activity in developing countries. The severity and duration of the impact will help policymakers to take a corrective action. This study finds a significant negative effect of the insurgency in Punjab on educational attainment in the long run, and finds a negative effect that is mostly felt by women. Using a large scale cross-sectional dataset for the state of Punjab (IHDS 2005) and a triple-difference regression

specification, we find a substantial long-term decline in education of women who were exposed to conflict during their schooling. This effect is greater for women in rural areas which is consistent with the evidence which suggests that conflict took place mostly in villages. Kumar (2001) found that 71% of all victims were from rural areas.

This negative effect on female education may have implications for health, female bargaining power within a household and may generate inter-generational spillovers where in children of women affected by the conflict have lower schooling as well. As the negative impact of conflict on schooling was concentrated in the rural areas, the conflict may have also contributed to the urban-rural human capital divide.

To explain the negative effect on women that we find, we turn to the examination of the detailed farm surveys focused on household expenditure and collected during the time of insurgency in Punjab. We observe that a farming household's expenditures on education and medicine declined in the response to the conflict in their district in the past year, but only when a household had relatively more girls than boys. This result may be due to either an increase in the returns to educating boys relative to girls or a higher risk to girls travelling to schools. Traditionally, in Punjab, elderly parents are taken care of by their sons and not daughters who once married are often precluded from supporting their natal families (Das Gupta, 1987). Thus, in the context of conflict and associated with it constraints on resources, parents may prefer investing in the education of sons, while investments in daughters will be reduced to account for lower resources available. Investment in education of girls suffers disproportionately in families with both boys and girls as a greater share of resources is allocated towards the education of their male siblings. Therefore, we may see a more pronounced gender inequality during and post-conflict times both within and between households.

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Figure 1a - Timeline of killings of civilians by terrorists, terrorists by security forces and security forces by terrorists in all incidents in the top panel

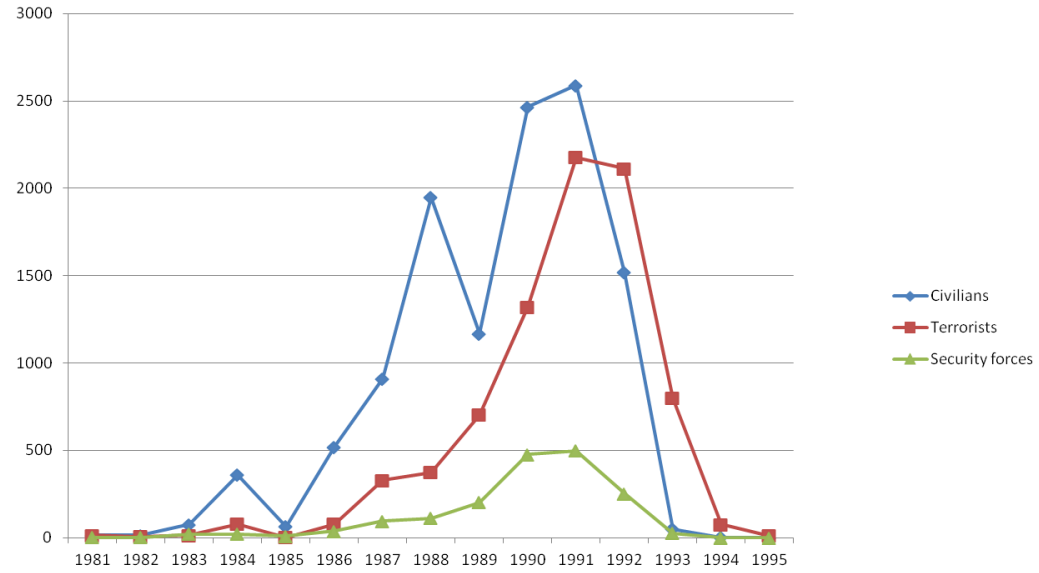
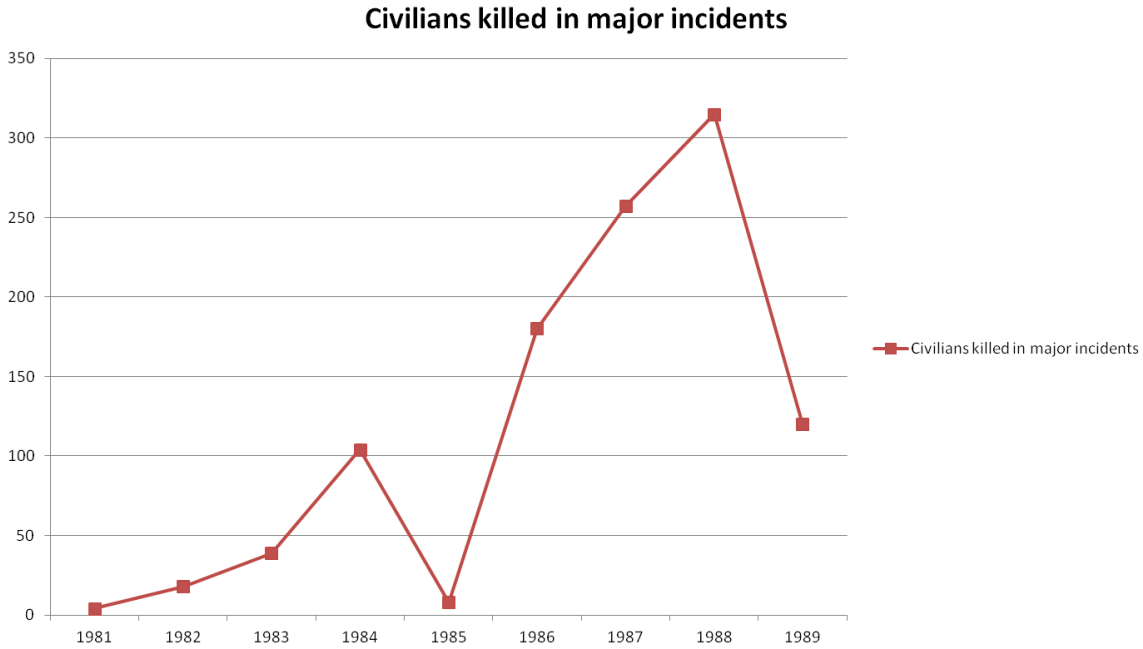
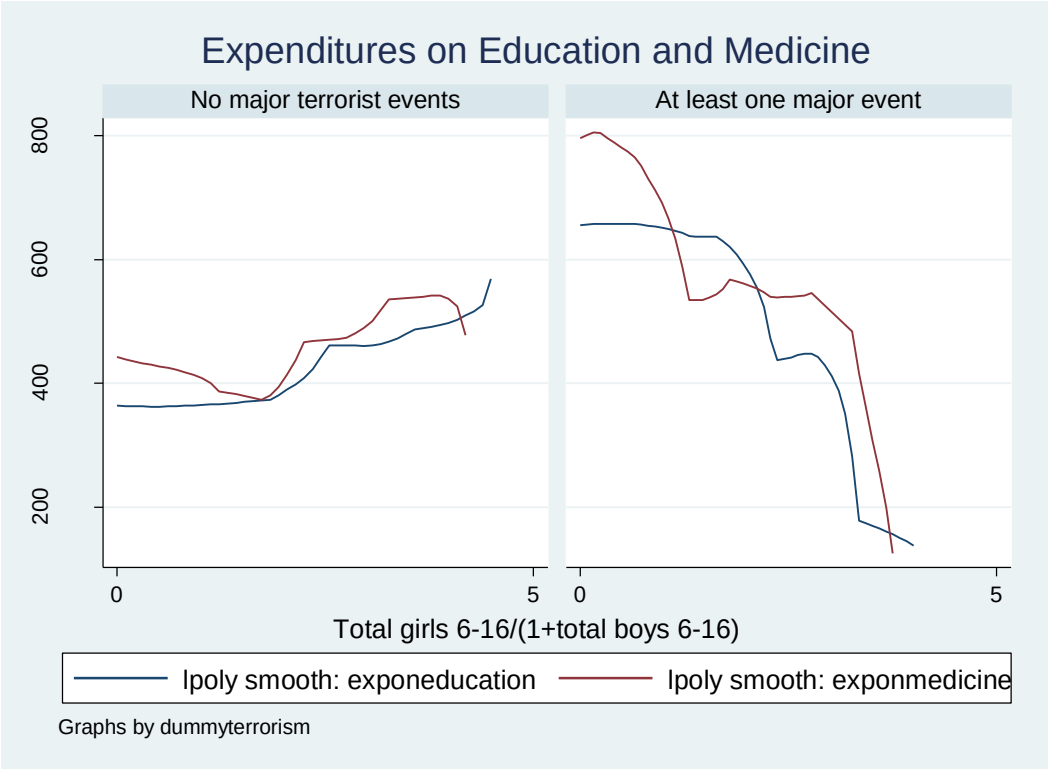


Figure 1b - Killings of civilians by terrorists



Sources: Data on terrorism incidents come from the South Asia Terrorism Portal and are described in Section III.2

Figure 2 - Expenditures on Education and Medicine and Gender Ratio



Source: Farm account surveys from Punjab Agricultural Department and terrorism data from South Asia Terrorism Portal. Data are described in Section III.2

Table 1 - Summary statistics for the samples used in the analysis of the long-term effect of conflict on education.

Panel A: Affected cohort = 1 if born in 1965-1984, '0' for born in 1954-1964

Variable	N obs	Mean	Std. Dev.	Min	Max
Years of education	3879	6.80	4.97	0	15
N cases, 1981-1993	3912	53.71	42.06	17	187
N killings, 1981-1993	3912	317.23	224.84	78	950
Female (indicator)	3912	0.49	0.50	0	1
Age (years)	3912	34.05	8.64	21	51
War cohort (indicator)	3912	0.76	0.43	0	1
Urban (indicator)	3912	0.34	0.47	0	1
Caste/ religion indicators					
Brahmin	3912	0.06	0.24	0	1
High Caste	3912	0.13	0.34	0	1
Obc	3912	0.18	0.39	0	1
Dalit	3912	0.32	0.47	0	1
Sikh and Jain	3912	0.28	0.45	0	1
Adivasi	3912	0.00	0.04	0	1
Muslim	3912	0.01	0.10	0	1
Christian	3912	0.02	0.13	0	1
Other	3912	0.35	0.48	0	1

Panel B: Affected cohort = 1 if born in 1965-1987, '0' for born in 1954-1964

Variable	Obs	Mean	Std. Dev.	Min	Max
Years of education	4441	7.04	4.90	0	15
N cases, 1981-1993	4480	53.58	42.10	17	187
N killings, 1981-1993	4480	315.83	224.86	78	950
Female (indicator)	4480	0.49	0.50	0	1
Age (years)	4480	32.13	9.52	18	51
War cohort (indicator)	4480	0.79	0.41	0	1
Urban (indicator)	4480	0.34	0.47	0	1
Caste/ religion indicators					
Brahmin	4480	0.06	0.24	0	1
High Caste	4480	0.13	0.34	0	1
Obc	4480	0.18	0.39	0	1
Dalit	4480	0.33	0.47	0	1
Sikh and Jain	4480	0.27	0.45	0	1
Adivasi	4480	0.00	0.05	0	1
Muslim	4480	0.01	0.09	0	1
Christian	4480	0.02	0.13	0	1
Other	4480	0.36	0.48	0	1

Notes: "other" category includes: Dalit, Christian, Muslim, Adivasi. Data sources: 2005 Indian Human Development Survey (IHDS) and South Asian Terrorism Portal (SATP) as described in section III.2.

Table 2- Summary statistics for the samples used in the analysis of the short-term effect of conflict on education.

Variable	Obs	Mean	Std. Dev.	Min	Max
Education	510	463.82	727.04	0	8750
Medicine	510	535.60	641.20	0	7135
Food	510	13805.99	6650.03	1968.36	46327
Social	510	1021.27	2976.19	10	27700
Religion	510	226.81	369.20	5	4145
Lighting	510	397.44	323.76	13.6	2615
Traveling	510	508.32	507.90	15	6030
Rainfall	510	614.91	350.32	42	2520
Area held	510	4.87	2.51	1.21	21.46
Females under 5	510	0.38	0.67	0	4
Males under 5	510	0.46	0.77	0	4
Total girls 6-16	510	0.81	1.00	0	8
Total boys 6-16	510	0.80	1.02	0	4
Females over 16	510	2.80	1.42	1	8
Males over 16	510	2.91	1.53	1	10
Total family members	510	8.15	3.42	2	23
Terrorism	510	0.34	0.47	0	1

Notes: Education includes the school fees, cost of books and stationery. Medicines includes the cost on medicines used and payment made to physicians and doctors. Food includes cereals, pulses and all other articles which formed part of the daily diet of the cultivator's family. Social included expenses incurred on social occasions such as births, deaths, and marriage celebrations. Religion expenses are offerings made at places of worship and the alms given at religious functions. Lighting is the expenditure on lighting included the cost of electricity or oil consumed match-boxes and repairs and replacement of lamps. Travelling are fares paid for visits to shrines and relations, living at distant places and also the interest and depreciation on the cost of bicycles kept for this purpose. Rainfall is measured at the nearest weather station to the household in mm. Area held is the area held by the farming household in hectares. Females under 5 are the total number of females under the age of 5 year in the household surveyed and other demographic variables are defined in the same way. Terrorism is a dummy that takes a value 1 if there is a major terrorist incident in that district in that year.

Table 3 - Full sample, Determinants of the years of education attained. Definition of conflict exposure: N of terrorist cases.

	Affected cohort = 1 if born in 1965-1984, '0' for born in 1954-1964			Affected cohort = 1 if born in 1965-1987, '0' for born in 1954-1964		
	1	2	3	4	5	6
N cases*Female* Affected	-0.014***	-0.016***	-0.016***	-0.012***	-0.014***	-0.014***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
N cases*Affected	0.004	0.006**	0.006**	0.004	0.005*	0.005**
	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Female*Affected Cohort	1.631***	1.888***	1.932***	1.730***	1.988***	2.060***
	(0.395)	(0.425)	(0.408)	(0.390)	(0.417)	(0.405)
N cases, 1981-1993	-0.011***	-0.008**	-0.018***	-0.011***	-0.008**	-0.018***
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)
Female	-2.681***	-2.891***	-2.926***	-2.683***	-2.880***	-2.912***
	(0.498)	(0.497)	(0.473)	(0.498)	(0.495)	(0.470)
N cases*Female	0.008	0.010*	0.010*	0.008	0.010*	0.010*
	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)
Urban residence	3.284***	2.820***	2.263***	3.114***	2.684***	2.188***
	(0.437)	(0.536)	(0.284)	(0.424)	(0.520)	(0.281)
Constant	7.133***	3.448***	5.431***	7.201***	3.793***	5.844***
	(0.953)	(0.892)	(0.724)	(0.943)	(0.897)	(0.748)
Caste controls	No	Yes	Yes	No	Yes	Yes
District FE	No	No	Yes	No	No	Yes
N	3879	3879	3879	4441	4441	4441
R squared	0.20	0.28	0.34	0.20	0.28	0.33

Notes: Robust standard errors in parentheses, clustered at the district level. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable is the years of education attained. All regressions include year of birth fixed effects. Caste (and religious affiliation) controls include dummy variables for an individual being Brahmin, High Caste, Sikh, other Backward Caste (OBC) and 'other category' used as a reference group. "Other category" includes members of Dalit caste, Christians, Muslims and Adivasi. Data sources: 2005 Indian Human Development Survey (IHDS) and South Asian Terrorism Portal (SATP) as described in section III.2.

Table 4 - Full sample, Determinants of the years of education attained. Definition of conflict exposure: N of terrorist killings.

	Affected cohort = 1 if born in 1965-1984, '0' for born in 1954-1964			Affected cohort = 1 if born in 1965-1987, '0' for born in 1954-1964		
	1	2	3	4	5	6
N killings* Female *Affected	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N cases* Affected	0.001	0.002**	0.001**	0.001	0.001*	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female* Affected Cohort	1.749***	1.995***	2.020***	1.880***	2.121***	2.176***
	(0.466)	(0.500)	(0.491)	(0.463)	(0.493)	(0.484)
N killings, 1981-1993	-0.002***	-0.002**	-0.004***	-0.002***	-0.002*	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female	-2.799***	-2.996***	-3.023***	-2.803***	-2.988***	-3.012***
	(0.567)	(0.567)	(0.541)	(0.568)	(0.564)	(0.538)
N killings*Female	0.002	0.002*	0.002*	0.002	0.002*	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Urban residence	3.264***	2.800***	2.261***	3.093***	2.664***	2.186***
	(0.442)	(0.537)	(0.286)	(0.430)	(0.521)	(0.282)
Constant	7.278***	3.582***	5.701***	7.349***	3.928***	6.122***
	(0.969)	(0.920)	(0.773)	(0.961)	(0.926)	(0.803)
Caste controls	No	Yes	Yes	No	Yes	Yes
District FE	No	No	Yes	No	No	Yes
N	3879	3879	3879	4441	4441	4441
R squared	0.19	0.28	0.34	0.19	0.28	0.33

Notes: Robust standard errors in parentheses, clustered at the district level. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable is the years of education attained. All regressions include year of birth fixed effects. Caste (and religious affiliation) controls include dummy variables for an individual being Brahmin, High Caste, Sikh, other Backward Caste (OBC) and 'other category' used as a reference group. "Other category" includes members of Dalit caste, Christians, Muslims and Adivasi. Data sources: 2005 Indian Human Development Survey (IHDS) and South Asian Terrorism Portal (SATP) as described in section III.2.

Table 5 - Rural sub-sample. Determinants of the years of education attained. Definition of conflict exposure: N of terrorist cases.

	Affected cohort = 1 if born in 1965-1984, '0' for born in 1954-1964			Affected cohort = 1 if born in 1965-1987, '0' for born in 1954-1964		
	1	2	3	4	5	6
N cases * Female *Affected	-0.017***	-0.018***	-0.018***	-0.015***	-0.016***	-0.017***
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)
N cases* Affected	0.004	0.005	0.006	0.002	0.004	0.005
	(0.005)	(0.004)	(0.003)	(0.005)	(0.004)	(0.003)
Female* Affected Cohort	1.471***	1.590***	1.634***	1.497***	1.660***	1.770***
	(0.198)	(0.198)	(0.154)	(0.151)	(0.156)	(0.151)
N cases, 1981-1993	-0.011*	-0.010*	-0.018***	-0.011*	-0.010*	-0.017***
	(0.005)	(0.005)	(0.003)	(0.005)	(0.005)	(0.003)
Female	-2.951***	-3.046***	-3.064***	-2.951***	-3.043***	-3.063***
	(0.335)	(0.368)	(0.288)	(0.335)	(0.361)	(0.280)
N cases*Female	0.012**	0.012**	0.012***	0.012**	0.012**	0.012***
	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)
Constant	8.204***	3.611**	5.467***	8.204***	3.882**	5.624***
	(1.358)	(1.302)	(1.247)	(1.357)	(1.249)	(1.221)
Caste controls	No	Yes	Yes	No	Yes	Yes
District FE	No	No	Yes	No	No	Yes
N	2552	2552	2552	2919	2919	2919
R squared	0.13	0.20	0.29	0.15	0.22	0.30

Notes: Robust standard errors in parentheses, clustered at the district level. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable is the years of education attained. All regressions include year of birth fixed effects. Caste (and religious affiliation) controls include dummy variables for an individual being Brahmin, High Caste, Sikh, other Backward Caste (OBC) and 'other category' used as a reference group. "Other category" includes members of Dalit caste, Christians, Muslims and Adivasi. Data sources: 2005 Indian Human Development Survey (IHDS) and South Asian Terrorism Portal (SATP) as described in section III.2.

Table 6 - Rural sub-sample. Determinants of the years of education attained. Definition of conflict exposure: N of terrorist killings.

	Affected cohort = 1 if born in 1965-1984, '0' for born in 1954-1964			Affected cohort = 1 if born in 1965-1987, '0' for born in 1954-1964		
	1	2	3	4	5	6
N killings* Female *Affected	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
N killings* Affected	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female* Affected Cohort	1.581***	1.694***	1.743***	1.620***	1.770***	1.897***
	(0.226)	(0.247)	(0.209)	(0.185)	(0.211)	(0.208)
N killings, 1981-1993	-0.002*	-0.002*	-0.001	-0.002*	-0.002*	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Female	-3.088***	-3.178***	-3.207***	-3.088***	-3.176***	-3.206***
	(0.385)	(0.435)	(0.354)	(0.385)	(0.427)	(0.346)
N cases*Female	0.002**	0.002**	0.003**	0.002**	0.002**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	8.342***	3.734**	3.226*	8.342***	3.999**	3.071*
	(1.395)	(1.332)	(1.478)	(1.394)	(1.268)	(1.456)
Caste controls	No	Yes	Yes	No	Yes	Yes
District FE	No	No	Yes	No	No	Yes
N	2552	2552	2552	2919	2919	2919
R squared	0.13	0.20	0.29	0.14	0.22	0.30

Notes: Robust standard errors in parentheses, clustered at the district level. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable is the years of education attained. All regressions include year of birth fixed effects. Caste (and religious affiliation) controls include dummy variables for an individual being Brahmin, High Caste, Sikh, other Backward Caste (OBC) and 'other category' used as a reference group. "Other category" includes members of Dalit caste, Christians, Muslims and Adivasi. Data sources: 2005 Indian Human Development Survey (IHDS) and South Asian Terrorism Portal (SATP) as described in section III.2.

Table 7 - Educational and Health Expenditure

	Panel A: Educational expenditure				Panel B: Health expenditure			
	Education	Education	Education	Education	Health	Health	Health	Health
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Terrorism	163.5*	167.1*	144.8*	107.4	17.05	13.16	-15.33	3.868
	(89.91)	(100.6)	(74.52)	(73.62)	(77.72)	(74.36)	(68.53)	(68.78)
Ratio6_16	49.35	39.59	58.51*	57.48	34.02	38.39	41.72*	46.41*
	(30.85)	(29.99)	(34.00)	(35.07)	(20.67)	(23.79)	(24.41)	(23.79)
Ratio6_16*Terrorism	-115.6*	-104.9*	-121.9*	-118.0*	-80.06*	-87.69*	-90.25*	-93.26*
	(59.80)	(58.54)	(63.56)	(61.66)	(44.25)	(48.65)	(49.88)	(47.09)
Constant	-73.35	434.1	1043.7*	471.8	389.1***	-412.8	-509.5	-486.7
	(98.68)	(791.8)	(537.2)	(640.6)	(109.8)	(535.4)	(583.6)	(938.0)
District fixed effects	X	X	X	X	X	X	X	X
Year fixed effects	X	X	X	X	X	X	X	X
Other controls		X	X	X		X	X	X
District-linear trends			X	X			X	X
District-quadratic trends				X				X
Observations	510	510	510	510	510	510	510	510
R-squared	0.15	0.18	0.23	0.22	0.31	0.33	0.34	0.33

Notes: Robust standard errors in parentheses clustered at the village level. Terrorism is a dummy that takes a value 1 if there is a major terrorist incident in that district in that year. Ratio6_16 is defined as total females in household between 6-16 years divided by 1+total males in household between 6-16 years. District fixed-effects are dummies for each of the twelve districts. Year fixed effects include dummies for all years post 1981 when terrorism begins. Other controls are annual district income, area under each type of soil (sandy, sandy loam, loam, clay loam, clay), rainfall measured at the nearest weather station, area of plot in hectares and total number of adult members. District-linear and quadratic trends are within district twelve linear and twelve quadratic time trends. Education included the school fees, cost of books and stationery. Medicines included the cost on medicines used and payment made to physicians and doctors.
*** p<0.01, ** p<0.05, * p<0.1.

Table 8 - Placebo for other age groups: Education

	Panel A: Below 6				Panel B: Over 16			
	Education	Education	Education	Education	Education	Education	Education	Education
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Terrorism	161.5	164.2	134.5	93.01	97.71	89.49	67.75	10.42
	(108.0)	(114.9)	(86.06)	(90.38)	(148.1)	(124.3)	(136.8)	(152.7)
Ratiobelow6	69.40	71.45	64.23	71.26				
	(69.76)	(62.72)	(62.36)	(68.73)				
Ratiobelow6 *Terrorism	-177.6	-161.1	-160.0	-160.2				
	(151.9)	(119.6)	(115.1)	(121.3)				
Ratioover16					38.47	11.46	28.97	44.71
					(63.87)	(69.77)	(69.98)	(71.66)
Ratioover16*Terrorism					21.64	44.12	32.77	58.93
					(228.6)	(214.4)	(207.3)	(223.6)
Constant	-60.39	461.9	1097.0**	532.7	-66.87	648.0	1051.2**	506.9
	(109.9)	(797.0)	(540.3)	(643.6)	(112.4)	(805.4)	(512.5)	(647.2)
District fixed effects	X	X	X	X	X	X	X	X
Year fixed effects	X	X	X	X	X	X	X	X
Other controls		X	X	X		X	X	X
District-linear trends			X	X			X	X
District-quadratic trends				X				X
Observations	510	510	510	510	510	510	510	510
R-squared	0.15	0.18	0.23	0.22	0.14	0.18	0.22	0.22

Notes: Robust standard errors in parentheses clustered at the village level. Terrorism is a dummy that takes a value 1 if there is a major terrorist incident in that district in that year. Ratiobelow6 is defined as total females in household below 6 years divided by 1+total males in household below 6 years. Ratioover16 is defined as total females in household over 6 years divided by 1+total males in household over 16 years. District fixed-effects are dummies for each of the twelve districts. Year fixed effects include dummies for all years post 1981 when terrorism begins. Other controls are annual district income, area under each type of soil (sandy, sandy loam, loam, clay loam, clay), rainfall measured at the nearest weather station, area of plot in hectares and total number of adult members. District-linear and quadratic trends are within district twelve linear and twelve quadratic time trends. Education included the school fees, cost of books and stationery. *** p<0.01, ** p<0.05, * p<0.1.

Table 9 - Educational and Health Expenditure (with totalboys 6-16, totalgirls 6-16)

	Panel A: Educational expenditure				Panel B: Health expenditure			
	Education	Education	Education	Education	Health	Health	Health	Health
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Terrorism	195.6*	239.6*	210.5*	170.6	-24.32	-30.35	-65.04	-48.13
	(111.4)	(140.2)	(111.1)	(110.8)	(70.93)	(73.71)	(85.05)	(104.0)
Totalgirls6_16	34.92	23.78	31.36	30.97	23.17	29.49*	29.26*	32.41*
	(22.65)	(21.52)	(23.76)	(24.42)	(15.02)	(16.33)	(17.10)	(16.60)
Totalboys6_16	7.670	4.350	-4.066	-6.083	-8.960	-3.886	-5.359	-0.297
	(20.85)	(24.10)	(21.83)	(20.74)	(17.16)	(18.14)	(17.84)	(18.63)
Totalgirls6_16 * Terrorism	-81.08*	-94.09**	-99.13**	-98.42**	-70.48**	-76.37*	-77.97*	-78.50**
	(44.87)	(45.81)	(49.45)	(48.33)	(35.55)	(38.57)	(40.77)	(38.20)
Totalboys6_16 * Terrorism	-28.42	-62.67	-54.94	-51.21	66.72	71.81	74.59	76.19
	(45.91)	(57.10)	(55.05)	(55.03)	(76.60)	(78.32)	(82.51)	(83.95)
Constant	-80.06	615.8	1013.8*	433.3	397.6***	-824.9	-467.6	-421.2
	(104.4)	(815.1)	(524.8)	(628.7)	(107.5)	(523.1)	(577.3)	(921.4)
District fixed effects	X	X	X	X	X	X	X	X
Year fixed effects	X	X	X	X	X	X	X	X
Other controls		X	X	X		X	X	X
District-linear trends			X	X			X	X
District-quadratic trends				X				X
Observations	510	510	510	510	510	510	510	510
R-squared	0.14	0.18	0.23	0.22	0.31	0.33	0.34	0.33

Notes: Robust standard errors in parentheses clustered at the village level. Terrorism is a dummy that takes a value 1 if there is a major terrorist incident in that district in that year. Totalgirls6_16 is defined as total females in household between 6-16 years. Totalboys6_16 is defined as total males in household between 6-16 years. District fixed-effects are dummies for each of the twelve districts. Year fixed effects include dummies for all years post 1981 when terrorism begins. Other controls are annual district income, area under each type of soil (sandy, sandy loam, loam, clay loam, clay), rainfall measured at the nearest weather station, area of plot in hectares and total number of adult members. District-linear and quadratic trends are within district twelve linear and twelve quadratic time trends. Education included the school fees, cost of books and stationery. Medicines included the cost on medicines used and payment made to physicians and doctors. *** p<0.01, ** p<0.05, * p<0.1.

Table 10 - Expenditure on other household items

	Food	Social	Religion	Lighting	Travelling
	(1)	(2)	(3)	(4)	(5)
Terrorism	-182.2	310.8	33.57	-16.56	-135.7**
	(662.7)	(641.2)	(35.10)	(18.71)	(59.51)
Ratio6_16	177.3	265.0	-10.94	13.07	-10.30
	(295.2)	(167.3)	(6.802)	(17.86)	(15.62)
Ratio6_16*Terrorism	-316.4	-649.1	-38.08	-32.06	79.17
	(485.0)	(449.1)	(28.67)	(26.33)	(59.30)
Constant	3247.9	-762.4	-489.2	-149.7	-739.5**
	(5026.2)	(3217.9)	(304.2)	(216.2)	(348.3)
District fixed effects	X	X	X	X	X
Year fixed effects	X	X	X	X	X
Other controls	X	X	X	X	X
District-linear trends	X	X	X	X	X
District-quadratic trends	X	X	X	X	X
Observations	510	510	510	510	510
R-squared	0.54	0.19	0.33	0.60	0.36

Notes: Robust standard errors in parentheses clustered at the village level. Terrorism is a dummy that takes a value 1 if there is a major terrorist incident in that district in that year. Ratio6_16 is defined as total females in household between 6-16 years divided by 1+total males in household between 6-16 years. District fixed-effects are dummies for each of the twelve districts. Year fixed effects include dummies for all years post 1981 when terrorism begins. Other controls are annual district income, area under each type of soil (sandy, sandy loam, loam, clay loam, clay), rainfall measured at the nearest weather station, area of plot in hectares and total number of adult members. District-linear and quadratic trends are within district twelve linear and twelve quadratic time trends. The dependent variables are defined in Table 2. *** p<0.01, ** p<0.05, * p<0.1.

Table 11 - Heterogeneous gender differential effects depending on age-group within school-children

	Panel A: Education		Panel B: Health	
	Education	Education	Health	Health
	(1)	(2)	(3)	(4)
Terrorism	164.5*	127.6	-25.41	-10.07
	(84.12)	(84.56)	(65.42)	(65.38)
Ratio6_12	31.91	35.99	33.56	34.07
	(44.53)	(48.26)	(31.26)	(30.15)
Ratio6_12 *Terrorism	-134.6	-138.3	-103.3	-120.2
	(90.49)	(94.79)	(74.33)	(75.52)
Ratio13_16	43.86	38.43	32.17	36.19
	(32.17)	(31.50)	(29.49)	(29.73)
Ratio13_16*Terrorism	-145.2	-141.1	2.966	30.26
	(122.5)	(125.3)	(87.26)	(89.29)
Constant	1066.0*	564.2	-468.5	-483.8
	(541.9)	(562.8)	(569.9)	(873.7)
District fixed effects	X	X	X	X
Year fixed effects	X	X	X	X
Other controls	X	X	X	X
District-linear trends	X	X	X	X
District-quadratic trends		X		X
Observations	510	510	510	510
R-squared	0.22	0.22	0.33	0.33

Notes: Robust standard errors in parentheses clustered at the village level. Terrorism is a dummy that takes a value 1 if there is a major terrorist incident in that district in that year. Ratio6_12 is defined as total females in household between 6-12 years divided by 1+ total males in household between 6-12 years. Ratio13_16 is defined as total females in household between 13 and 16 years divided by 1+total males in household between 13 and 16 years. District fixed-effects are dummies for each of the twelve districts. Year fixed effects include dummies for all years post 1981 when terrorism begins. Other controls are annual district income, area under each type of soil (sandy, sandy loam, loam, clay loam, clay), rainfall measured at the nearest weather station, area of plot in hectares and total number of adult members. District-linear and quadratic trends are within district twelve linear and twelve quadratic time trends. Education included the school fees, cost of books and stationery. Medicines included the cost on medicines used and payment made to physicians and doctors.
*** p<0.01, ** p<0.05, * p<0.1.

Appendix Table 1 – Family composition and expenditures

	Panel A: Educational expenditure			Panel B: Health expenditure		
	Only girls	Only boys	Both	Only girls	Only boys	Both
	(1)	(2)	(3)	(4)	(5)	(6)
Terrorism	-50.20	303.4	-205.5	-101.9	-245.4	-83.72
	(232.4)	(199.8)	(134.2)	(106.6)	(268.6)	(140.0)
Total adult members	30.67	-71.67	17.23	10.51	14.81	-3.794
	(50.66)	(64.22)	(16.13)	(11.22)	(42.09)	(21.03)
Constant	4350.1	462.6	1235.4	3141.3**	-718.6	-3156.5
	(2874.3)	(4927.5)	(2054.3)	(1285.0)	(5397.5)	(2357.2)
District fixed effects	X	X	X	X	X	X
Year fixed effects	X	X	X	X	X	X
Other controls	X	X	X	X	X	X
District-linear trends	X	X	X	X	X	X
District-quadratic trends	X	X	X	X	X	X
Observations	112	99	148	112	99	148
R-squared	0.42	0.65	0.42	0.87	0.60	0.61

Notes: Robust standard errors in parentheses clustered at the village level. Terrorism is a dummy that takes a value 1 if there is a major terrorist incident in that district in that year. District fixed-effects are dummies for each of the twelve districts. Year fixed effects include dummies for all years post 1981 when terrorism begins. Other controls are annual district income, area under each type of soil (sandy, sandy loam, loam, clay loam, clay), rainfall measured at the nearest weather station, area of plot in hectares and total number of adult members. District-linear and quadratic trends are within district twelve linear and twelve quadratic time trends. Education included the school fees, cost of books and stationery. Medicines included the cost on medicines used and payment made to physicians and doctors.
*** p<0.01, ** p<0.05, * p<0.1.

Appendix Table 2 - Placebo for other age groups: Health

	Panel A: Below 6				Panel B: Over 16			
	Health	Health	Health	Health	Health	Health	Health	Health
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Terrorism	-23.74	-25.49	-64.24	-52.37	14.88	12.06	0.532	18.33
	(69.46)	(64.93)	(58.19)	(51.67)	(128.8)	(122.5)	(107.3)	(123.5)
Ratiobelow6	36.92	42.95	12.90	11.68				
	(32.45)	(34.38)	(32.65)	(32.90)				
Ratiobelow6 *Terrorism	8.567	-7.725	29.32	42.57				
	(99.07)	(86.13)	(96.98)	(97.48)				
Ratioover16					2.14	18.26	26.82	33.85
					(41.07)	(51.52)	(45.10)	(45.10)
Ratioover16*Terrorism					-42.86	-47.95	-72.00	-72.77
					(139.9)	(134.0)	(126.3)	(131.7)
Constant	407.6***	-408.0	-521.2	-512.8	413.8***	-820.2	-524.7	-480.6
	(108.3)	(535.0)	(591.5)	(933.5)	(125.9)	(543.8)	(587.5)	(927.5)
District fixed effects	X	X	X	X	X	X	X	X
Year fixed effects	X	X	X	X	X	X	X	X
Other controls		X	X	X		X	X	X
District-linear trends			X	X			X	X
District-quadratic trends				X				X
Observations	510	510	510	510	510	510	510	510
R-squared	0.31	0.33	0.33	0.33	0.31	0.33	0.33	0.33

Notes: Robust standard errors in parentheses clustered at the village level. Terrorism is a dummy that takes a value 1 if there is a major terrorist incident in that district in that year. Ratiobelow6 is defined as total females in household below 6 years divided by 1+total males in household below 6 years. Ratioover16 is defined as total females in household over 6 years divided by 1+total males in household over 16 years. District fixed-effects are dummies for each of the twelve districts. Year fixed effects include dummies for all years post 1981 when terrorism begins. Other controls are annual district income, area under each type of soil (sandy, sandy loam, loam, clay loam, clay), rainfall measured at the nearest weather station, area of plot in hectares and total number of adult members. District-linear and quadratic trends are within district twelve linear and twelve quadratic time trends. Medicines included the cost on medicines used and payment made to physicians and doctors. *** p<0.01, ** p<0.05, * p<0.1.

Appendix Figure 1

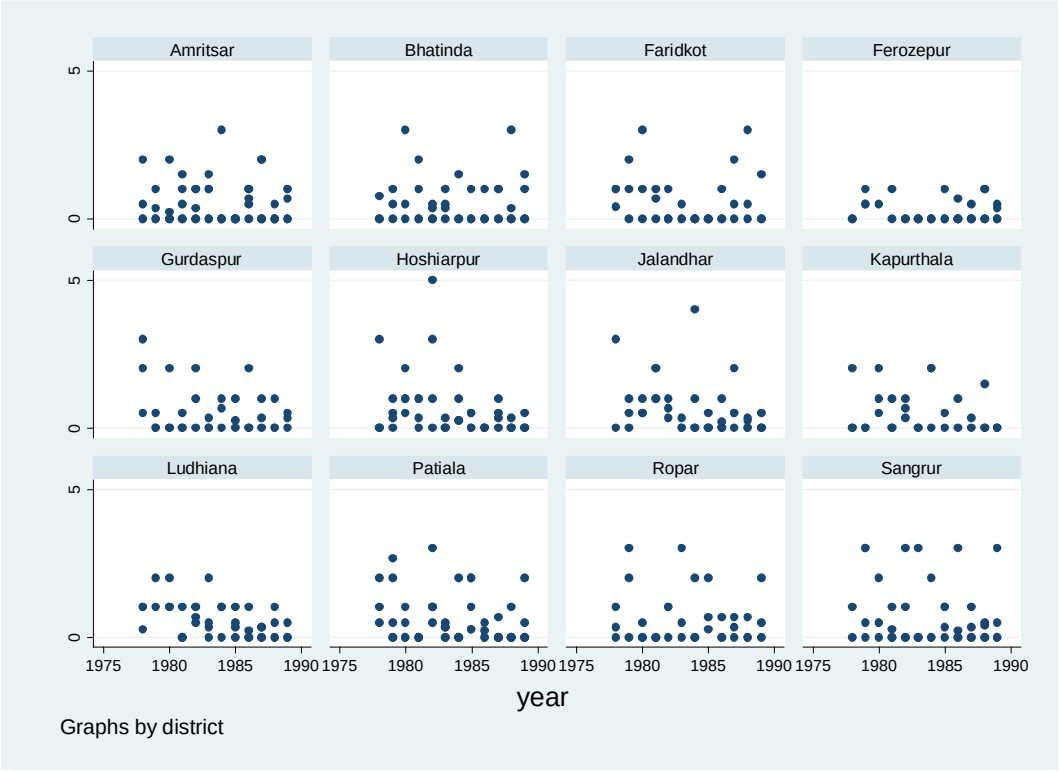


Figure shows how the mean ratio6_16 defined as total females in household between 6-16 years divided by 1+total males in household between 6-16 years varies by year for each district.

Appendix Figure 2

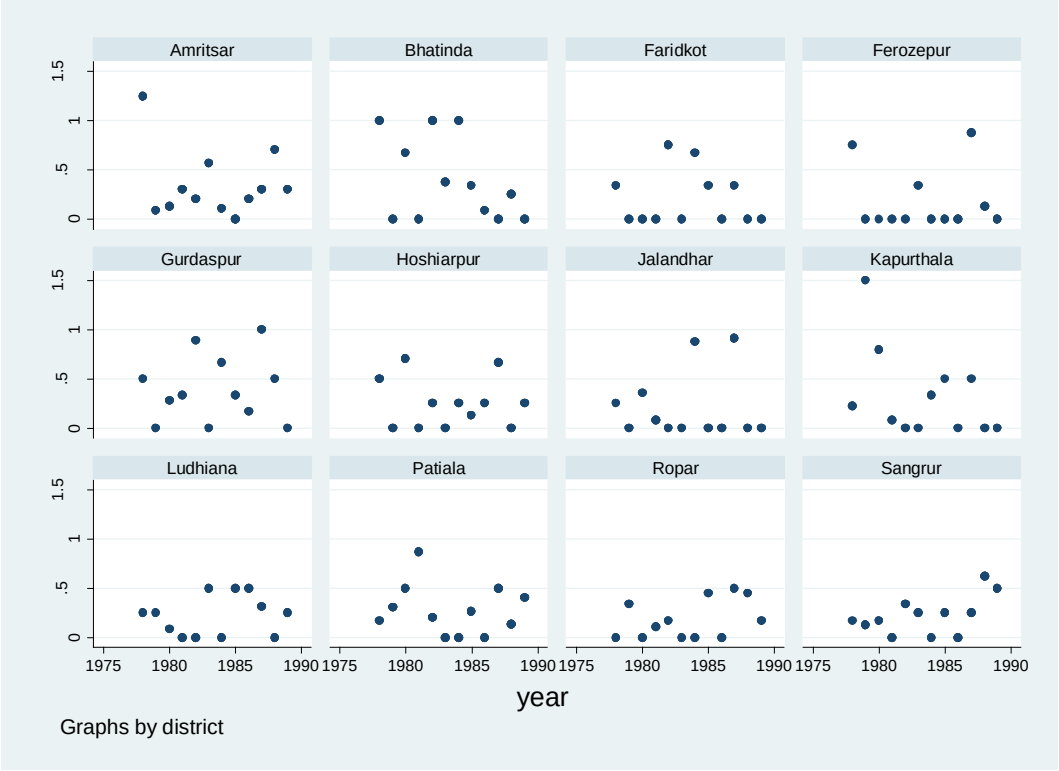


Figure shows how the mean ratio under 6 defined as total females in household between under 6 years divided by 1+total males in household under 6 years varies by year for each district.