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Child Labor and Conflict: Evidence from Afghanistan

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Abstract

We study the impact of conflict on both the extensive and the intensive margin of child labor in Afghanistan. We identify and test two main mechanisms. First, if conflict reduces a household income through a decline in parent's compensations, child labor may insure against the decrease in consumption (extensive margin). Second, a child may work longer hours if the marginal benefits of working under conflict is greater than its marginal cost, which may depend on the relative compensations between adults and children, and on the alternative activities (e.g. schooling). Using detailed conflict data from the Afghan War Diary we identify the effect of conflict relying on a shift-share IV strategy. We find that conflict increases the probability that girls work, but reduces the number of hours worked. Our results suggest that this is due to a decrease in household income and an increase in the relative compensations of adults.

Keywords: Afghanistan, child labor, school attendance, conflict

JEL classification: J13, D74

1 Introduction

The economic and social consequences of conflicts are dramatic for children, both in youth and later on in adulthood. One immediate consequence is child labor. Does conflict push more children to work, and/or to work more hours? While the economic literature on child labor and on conflict are rich, they rarely speak to each-other. Relatively little is known about whether and how conflict influences the incidence of child labor. The few studies analyzing the micro-economic effects of conflicts on children focus on schooling and on the extensive margin of child labor supply (Di Maio and Nandi, 2013; Rodriguez and Sanchez, 2012). And there are no studies that analyze the impact of conflict on the intensive margin (the number of hours worked).

In this paper we provide new evidence on whether the recent conflict in Afghanistan had an impact on the number of children working (extensive margin), and on the number of hours they worked once they are in the labor market (intensive margin). Extending the work by Basu and Van (1998) to a conflict setting we identify and test two main mechanisms.

First, if conflict reduces a household income through a decline in the compensation of adults, parents may employ child labor to insure against the decrease in consumption. Second, in deciding how many hours a child should work, parents may evaluate if the marginal benefits of child labor under conflict is greater than its marginal cost. This will depend on whether the relative compensations of adults and children are affected by conflict, and on the alternative activities that children may attend. An increase in the relative wage of children with respect to parents may increase the number of hours they work (replacing adult's work). Similarly, reduced availability of schooling (for security reason, or for destruction of infrastructures) may increase the marginal benefits of children work (for the household) than of investing in their education.

The recent conflict (2001-09) in Afghanistan varies substantially in its intensity across districts, and so does child labor. Afghanistan is also one of the countries with the highest incidence of child labor. Considering as working all children that declared

to have done some work in the previous week, the survey data used in this study suggest that 18.5% of Afghan children were working in 2007-08. This percentage is well above the average child labor rate in low-income countries for children between 5-17, which was 10.6% in 2012 (ILO, 2013). Even though Afghanistan has made some legislative commitments in the past two decades[1], child labor still accounts for one of the largest problems in the country. Given that Afghanistan still experience severe conflict events and high level of insecurity, conflict induced child labor may represent a major impediment to Afghan development (Akresh and De Walque, 2008).

We study the effect of conflict on the extensive and intensive margins of child labor exploiting the variation of conflict intensity across districts, a rich household survey that investigates children participation in the labor market, extremely precise and reliable information on conflict events, and a robust shift-share instrumental variable (IV) strategy. We find that conflict significantly increases the probability that a girl works by about 7 percentage points, but no significant effect on boys. We also find that conflict significantly decrease girls' average non-domestic hours worked per day of about half an hour, and again no significant results on boys. We also find no significant effect on domestic hours worked.

Overall, the findings suggest that necessity is the main driver of the increase in children labor supply. As predicted by the framework used in this paper, more girls are sent to work as the compensation of work reduces, having a negative impact on households' expenditures. However, as the compensation of children fall more than proportionally with respect to adults, children work fewer hours. We find that the opportunity cost related to access to schooling does not play a significant role in our results.

[1]In 2013, Afghanistan made a moderate advancement in efforts to eliminate the worst forms of child labor. The Government of Afghanistan announced the adoption of a list of 29 jobs/working conditions prohibited for children.

Relevant Literature

Sending children to work is often a necessity to guarantee a household's survival (Basu and Van, 1998).[2] In the literature on child labor only a few studies estimate the impact of conflict on child labor, and all focus on the extensive margin: they all find that conflict increases the number of children working.

Di Maio and Nandi (2013) identify the impact of conflict on child labor and school attendance in the West Bank exploiting the exogenous number of days of closure between Israel and the Palestinian Territory. They find that for each day of closure, child labor increases and school attendance (weakly) decreases in the West Bank. Rodriguez and Sanchez (2012), instrument for conflict in Colombia using the lagged antinarcotics operations at the municipality level and the homicide captures at the state level interacted with municipal population. They find that conflict increases child labor by inducing them to drop out of school and enter the labor market. These studies suggest that conflict may increase as well the number of hours worked, but this effect has not been tested yet in the economic literature.

One main channel through which conflict may push households income below subsistence is a reduction in compensations. Di Maio and Nandi (2013) and Calì and Miaari (2013) find that barriers to mobility associated with the Palestinian conflict reduced wages. Iyer and Santos (2012) show that across several South Asia countries, conflict areas experience an increase in unpaid (family) jobs. Bove and Gavrilova (2014) find that military deployment in Afghanistan increase both wages and prices. Kondylis (2010) finds that in Bosnia displaced men were more likely to be unemployed and displaced women were more likely to drop out from the labor force.

However, in a country such as Afghanistan, predominantly rural, the majority of employment is self-employment, subsistence agriculture, or family employment. Paid labor represents a small fractions of household's compensation. It is therefore more

[2]According to the *Luxury Axiom*: "A family will send the children to the labor market only if the family's income from non-child-labor sources drops very low" (Basu and Van, 1998, p. 416). The child labor phenomena has been widely analyzed both theoretically and empirically in the recent literature. Theoretically, a key reference point in the literature is Basu and Van (1998) and the most recent literature on the topic is summarized in Edmonds (2007) and Bar and Basu (2009).

relevant to investigate how conflict affects self-employment and through this the compensation. A small number of papers have studied households allocation of labor in conflict. They all find that conflict pushes households from activities with higher returns to investment to activities with lower returns (see for example Bundervoet (2010); Ciarli et al. (2015); Deininger (2003)).

Increased work may also be the result of reduced schooling options. Most studies look at how conflict affects school enrollment and attainment, suggesting a negative effect on primary education, although results may differ on the extent and the duration of these effects. Some studies find that conflict has a short term impact on primary school enrollment (e.g. Chen et al., 2008). Others find long-term negative effects of violent conflict on school enrollment, school attainment and and an increase in school drop-out (e.g. Akresh and De Walque (2008) for Rwanda, Chamarbagwala and Morán (2011) for Guatemala, Leon (2012) for Peru, Shemyakina (2011) for Tajikistan, Swee et al. (2009) for Bosnia and Herzegovina, and Rodriguez and Sanchez (2012) for Colombia).

The paper contributes in several ways to the extant literature. We extend the basic child labor framework to understand main mechanisms that operate in a conflict setting. We improve the identification of the effect of conflict by exploiting reliable and precise information on conflict location. We look at direct, local area specific conflict effects rather than the indirect conflict effects examined by Di Maio and Nandi (2013). We provide preliminary evidence on the how conflict affect the number of hours worked. And we extend the mechanisms that may induce change in child labor beyond the schooling versus working decisions (Rodriguez and Sanchez, 2012), exploring changes in expenditure and relative changes in compensation between adults and children.

The paper is structured as follows. Section 2 illustrates and discusses the theoretical framework (details are found in the Appendix). Section 3 describes how we address the empirical strategy. Section 4 presents the main results, the estimation of the mechanisms and the robustness checks. Finally, Section 5 concludes.

2 Theoretical Framework

To illustrate the relation between conflict and child labor we employ the basic model by Basu and Van (1998). We make a number of assumptions to keep the illustration straightforward. First, as standard in the literature (Basu and Van, 1998) we assume that parents prefer that their children do not work, unless there is not enough income to sustain the household. Second, we assume that all occupations can be held by adults and children, although the productivity and therefore the compensation may be significantly different (higher for adults). In the context of Afghanistan, where most households rely on non-sophisticated self-employment activities, particularly in agriculture (e.g. Ciarli et al., 2015; Lind et al., 2014; Iyer and Santos, 2012), the assumption is plausible for many occupations. Third, the decision of whether a child works is taken by the household (parents). Fourth, we assume that the decisions about a child working or not, and for how many hours, are taken in separate moments. We will discuss both decision in turn, with respect to adults' and children's compensations.

Following Basu and Van (1998), we define $c \geq 0$ parents' consumption, $M \geq 1$ the total number of children in a household, $e_m \in \{0, 1\}$ a children's $m \in [1, M]$ work effort, $w_a > 0$ and $w_c \geq 0$ respectively the parents' and children's compensation for work, and $0 < b < 1$ children's equivalent scale of consumption. For simplicity w_a represents the compensation for both parent's work, and each child earns w_c. A household's income is than the sum of all compensations, depending on how many children work: $w_a + \sum_1^M e_m w_c$. The budget constrain is the sum of adults' and children's consumption: $c + Mbc$.

Given the first altruistic assumption, the following general ordering of preferences is valid:

$$(c, 0) \succ (c + \delta, 1) \succ (c + 2\delta, 2) \succ \ldots \succ (c + M\delta, M) \tag{1}$$

where δ is the increased level of consumption granted by a child's compensation. A households always prefers that fewer children work. Introducing the budget constraint, a household will send the first child to work only if the parents' compensation is not

enough for the survival of the whole household. Similarly, a household will send the Mth child to work only if the parents' compensation and the $M-1$ children compensations are not sufficient for the household's survival:

$$\begin{aligned} &(c,0) \succ (c+\delta,1) && \text{if} && w_a \geq c + Mbc \\ &(c+M\delta,M) \succ (c+(M-1)\delta,(M-1)) && \text{if} && w_a + (M-1)w_c \leq c + Mbc \end{aligned} \tag{2}$$

As a result, the number of children that work increase as parents' compensation decreases.

To see this graphically, we use the generalised effort function derived by Basu and Van (1998) as an outcome of households maximising their utility with respect to consumption and leisure ($u(c, 1-e)$) subject to the above budget constraint:

$$e(w_a, w_c) = \begin{cases} 0 & \text{if } \; s + sMb + Mw_c \leq w_a \\ 1 & \text{if } \; s + sMb - Mw_c \geq w_a \\ \frac{Mw_c - w_a + s + sMb}{2Mw_c} & \text{otherwise} \end{cases} \tag{3}$$

where $s > 0$ is the subsistence level.

We use this simple model to discuss how changes in household's income and relative wages may influence the decision to send children to work, and how much they work. A graphical explanation of the model behavior is provided in Appendix B.

To summarise, if an increase in conflict reduces w_a and w_c, reducing household income, the number of children working is expected to increase (extensive margin). On the intensive margin, if w_c reduces more than proportionally with respect to w_a, children exert lower effort (work for a fewer number of hours), as the opportunity cost of reducing leisure is not compensated by the increase in household income. Whether conflict in Afghanistan has a larger effect on w_a or on w_c depends on the changes in the household's income generating activities, which is an empirical question.

3 Empirical Strategy

Following Manacorda (2006) empirical strategy we test the child labor extensive margin controlling for unobservable w_a and w_c with characteristics of the individual and of the environment. For the individual, as in Manacorda (2006) we use children age; for the environment we use our main variable of interest, conflict intensity, which we expect to reduce both w_a and w_c. Following the theoretical framework, we also control for M and b with the household size and average age.

First, we estimate the effect of our main variable of interest, conflict, on the extensive and intensive margin.

Second, we test for the two main mechanisms explaining the extensive and intensive margins. Does conflict reduce w_a and w_c to the extent that a reduction in s induces parents to send one or more children to work? In our framework s depends on compensations, and will be proxied by household expenditures. Does conflict change the relative compensation, such that a decrease in w_a/w_c increases the number of hours worked by children? To answer to this question we test the effect of conflict on the share of household and children working in a household. Under the assumptions that if more adults work with respect to children, is because the adult's compensation is relatively higher.

Third, we also test for an alternative hypothesis that can be indirectly derived from the model: does a decrease in leisure opportunities increases the probability that child works? We test this hypothesis exploiting information on children enrollment in school.

3.1 Estimated Equation

To test for children effort we define the following estimation equation

$$e_{ihd} = \alpha_1 + \alpha_2 Conf_d + \alpha_3 X_i + \alpha_4 X_h + \alpha_5 X_d + u_{ihd} \tag{4}$$

where e_{ihd} is the effort of child i in household h in district d; $Conf_d$ is the number of conflict events per district (normalised by population); X_i are children characteristics, sex and age, which proxy for wage differences with respect to adults; X_h are household characteristics, X_d are the district characteristics.

Following the theoretical framework, we estimate two versions of Equation 4, distinguishing between the decision of whether to send a child to work or not ($e = [0; \neq 0]$) – extensive margin, and the amount of effort in case the child works $e \in (0, 1]$ – intensive margin. To estimate the first version we use a Linear Probability Model (LPM). To test for the second version we employ an OLS. In Equation 4 the outcome of e_{ihd} is either 0 or 1 for the LPM and a natural number in the case of the OLS.[3] We estimate the equation clustering standard errors at the district level in order to control for the group correlation of the error term within the districts.

The household control variables chosen are those that are supposed to have an impact on child labor according to the model and the literature (Manacorda, 2006). A full list and description is available in Appendix A.1 in Table 10. Household size captures M, a proxy for consumption; information on gender, literacy and age of the household head and for the household's average, as these characteristics may influence income and a household's decisions to send children to work; shocks experienced in the previous year, other than conflict, which may also affect income; and income proxies, such as number of assets, electricity, and remittances.

We also control for district level covariates which may influence children participation to labor and conflict: the geographical variations in altitude which could affect agricultural activities, share of rural communities, and average number of households whose first source of income is opium cultivation, average population age and share of male adults.

Finally, as most of the children work in agricultural activities, we add months fixed effects to control for potential seasonality bias. We do not include district or province

[3] We also estimate a Tobit model to account for both the extensive and intensive margin in Section 4.3.

fixed effects as they soak up most of the conflict variation.

3.2 Identification Strategy

Equation 4 may fail to correctly identify the effect of conflict on the probability that a child works and on the number of hours worked. First, we cannot control for differences between areas such as average wealth and ethnicity. It is possible that poorer areas are both more affected by conflict and have higher number of children working, and that some ethnic groups are more likely to experience conflict and a higher incidence of child labor. Second, despite the high quality and precision of our conflict data, some measurement error may persist.

We address endogeneity with a shift-share instrumental variable strategy common in labor and migration studies (Bartel, 1989; Altonji and Card, 1991; Saiz, 2003, e.g.) and already implemented in Ciarli et al. (2015) with regards to conflict. We instrument conflict in time t and district d multiplying the share of conflicts in district d in a previous conflict with the nation-level conflict intensity in time t. We use the Soviet war between 1979-1989 to compute the share of conflict in district d, assuming that past conflict intensity is unrelated to child labor today.[4]

The reference to the Soviet conflict (1979-1989) to instrument for the effect of the recent conflict on child labor may raise questions on the exclusion restriction. For instance, omitted geographical and ethnic factors may have influenced both the Soviet conflict in 1979-89 and child labor in 2007-2008. To control for these we include the average altitude of the communities in the district. As a robustness check, we also include the distance of the household from Pakistan, which is a good proxy for terrain ruggedness, altitude and ethnic groups.

Second, conflict in 1979-89 could affect child labor thirty years after through its impact on the parents' schooling or death. Although Afghanistan has one of the youngest

[4]We report in Panel A of all estimation tables the F-test, which is safely above the rule of thumb of 10. This suggests that the instrument is relevant and past conflict intensity in a sector might be correlated with the current intensity because of exogenous geographical factors (such as accessibility, position, etc.).

population in the world We address impact on parent's education by controlling for the household head's literacy. As a robustness check we also control for the presence of the father and of the mother in the household.

Third, the Soviet conflict might have changed the geographical distribution of child-labor-intensive economic sectors across districts. Although conflict does influence households' activities in the short run, in 20 years the Afghan economy has changed more profoundly. Opium production has increased more than five times between 1990 and 2007 (more than 40 times between 1980 and 2007) (Lind et al., 2014); and the level and composition of exports has changed dramatically between 1994 and 2007 (Hausmann et al., 2014);[5]; and informal cross-border trade routes also have intensified substantially since the end of the 90's (Ghiasy et al., 2015). Such changes are so substantial that they are unlikely to be influenced by household's labor allocation. Finally, within agriculture, changes in access to arable land, irrigation, and productivity in Afghanistan have been affected mainly by climate changes in the last two decades (Aich et al., 2017), including one of the most sever drought between 1998-2006. Such changes are likely to wipe away the effects of past conflict (occurred 20 years earlier) on economic sectors in 2007-2008.

3.3 Data

We construct a unique dataset which combines household information on child labor from the National Risk and Vulnerability Assessment (NRVA) 2007 - 2008 survey, conflict data from the Afghan War Diaries (AWD) and from the Global Data on Events, Location and Tone (GDELT). All datasets are geo-coded and were matched by district using GIS software.

NRVA 2007 - 2008 (, dataset1): the survey covers 20,576 rural and urban households (152,262 individuals) in all Afghan 34 provinces, 395 districts (2,572 clusters/villages). The draft questionnaires were tested twice in the field and a pilot test of the ques-

[5]Partly due to the cease of the production of natural gas after the Russian occupation (Ghiasy et al., 2015).

tionnaires took place in five regions for further and final improvements. The fieldwork started in mid-August 2007 and lasted up to the end of August 2008. The sample frame is based on the updated CSO pre-census household listing. The sample is proportional to population, with over-sampling of smaller provinces and large cities.

The analysis focuses on children between 6-15 years old. The data include information on whether the child is working (extensive margin) and on how many hours she works (intensive margin). A child is defined to be in work if economically active i.e. if she has worked for at least one hour (remunerated or not) in the week before the interview. We also exploit information on the sector, and we distinguish between domestic and non-domestic hours worked. A part from child labor, we used NRVA to construct information on individuals, households and district controls.

AWD (, dataset2): a large dataset of all military activities recorded (and not cleared by intelligence, i.e. unbiased) during the Afghan war between 2004-2009 by US troops. The data was reported by soldiers and intelligence officers, and includes intelligence information, reports of meetings with political partners, and related details. Each report contains a large amount of the event's details, including the geographical coordinates, the number of individuals killed and wounded, and a description of the actions. These details were machine coded in a set of variables immediately after they were leaked. A number of studies have verified the reliability and the accuracy of these data (Zammit-Mangion et al., 2012, e.g.).

We define 'relevant' conflict events those events which can be observed by the population and may cause disruption of economic activity, or fear, or any other condition that could affect households' behaviour, and exclude other events such as unexploded bombs or medical interventions (see Table 11 in the Appendix).[6] Finally, each conflict event was assigned to a district. Conflict is measured as the number of conflict events in a district by population (in thousands).

GDELT (, dataset3): the dataset contains geo-referenced conflict events reported by media since 1979, broken into four categories: verbal cooperation (e.g. military

[6]See (O'Loughlin et al., 2010) for a similar classification.

agreements), material cooperation (actions of allied troops), verbal conflict (e.g. declarations of a state of war), and material conflict (e.g. exploded bombs).

We sum all material conflict events, per district, between 1979-1989 to compute the relative intensity of a district during the Soviet conflict.

The variables used for the analysis are described in Table 10 in the Appendix.

3.4 Data description

Table 1 presents the average percentage of children 6-15 working in a household, distinguishing by gender.

Table 1: **Percentage of children working**

Total			Males			Females		
Total	High conflict	Low conflict	Total	High conflict	Low conflict	Total	High conflict	Low conflict
18.5	23.6	19.6	12.0	14.8	12.2	6.4	8.7	7.4

In 2007-2008, about 18.5% of children between 6 and 15 years old were working to some extent in some activity. This share is higher, about 23.6%, when considering high conflict intensity areas.[7] There are also important gender differences: the share of boys working is almost the double than the share of females. When compared with the world average in 2012 (10.6%, for children aged 5-17) (ILO, 2013) in Afghanistan there is a higher than average incidence of child labor.

Tables 2, 3, and 4 show the number of hours worked[8] by an average child in the past week, respectively in total, non-domestic activities, and domestic activities. Children worked on average 4 hours per day in non-domestic activities and 1.5 hours per day in domestic ones, with small difference across gender in the total number of hours: males work slightly more in non-domestic and females slightly more in domestic activities. For all activities the number of hours worked slightly decreases in higher conflict intensity areas compared to lower intensity ones.

[7] We define high conflict intensity areas those in the top quartile of the conflict distribution; low conflict intensity areas those in the lowest quartile.

[8] Definition in Table 10

Table 2: **N. of average total hours worked per day in the past week by sex and conflict intensity**

Total			Males			Females		
Total	High conflict	Low conflict	Total	High conflict	Low conflict	Total	High conflict	Low conflict
5.5	5.3	5.9	5.4	5.1	5.8	5.6	5.7	6.0

Table 3: **N. of average non-domestic hours worked per day in the past week by sex and conflict intensity**

Total			Males			Females		
Total	High conflict	Low conflict	Total	High conflict	Low conflict	Total	High conflict	Low conflict
4.0	3.9	4.1	5.1	4.1	3.9	3.7	3.9	3.9

Table 4: **N. of average domestic hours worked per day in the past week by sex and conflict intensity**

Total			Males			Females		
Total	High conflict	Low conflict	Total	High conflict	Low conflict	Total	High conflict	Low conflict
1.5	1.5	1.8	1.2	1.6	1.6	1.9	1.8	2.2

Figure 3a and 3b in Appendix D show the distribution of both domestic and non-domestic hours worked in high and low conflict areas.

We next look at how child labor is distributed among different activities, distinguishing by gender (Table 5). The relative majority of children work in agriculture (41%), which is the most populated group of activities for males (51%), but not so for females (21%). The second most frequent group of activities is within the household (39%), and disproportionately so for females (71%). The other important activities are in shops (5%), on the street (5%), and in an employer's house (1%), all male dominated.

Table 6 shows the summary statistics for all variables for the sample used in the analysis. The children in the sample are on average about 10 years old and the sample is gender balanced. Almost all the households have a male household head who on average is about 45 years old and not literate (68%). Most of the households live in rural communities (77%) and have an equal share of male and female adults. Districts are composed mainly by rural communities (80%) and, on average, about 4.5% of the households in the district declare to cultivate opium as a main household activity. The average age of household members in each district is about 20.3 years old and the

Table 5: **Percentage of children working by type of activity**

Type of activity	Total	Males	Females
At the household dwelling	39.2	22.3	70.8
Employer's house	1.1	1.3	0.7
Formal Office	0.0	0.0	0.0
Factory	0.2	0.3	0.0
Plantations/farm/garden	40.6	51.1	21.0
Construction site	0.7	1.0	0.1
Quarrying sites	0.0	0.1	0.0
Shop/Market/ Kiosk/ Restaurant	4.9	7.3	0.5
On the street (selling or carrying things)	1.1	1.7	0.1
On the street (collecting things for household)	3.9	4.3	3.1
Other (specify)	8.0	10.3	3.5
Total	100.00	100.0	100.0

share of literate household members is about 24%. In 2007/8 on average an Afghan district experienced 0.43 conflicts every 1000 inhabitants.

Table 6: **Summary statistics**

Variable	Mean	Std. Dev.	Min.	Max.	N
Dependent variables					
Working child (Dummy)	0.185	0.388	0	1	48176
N. of non-domestic hours worked	0.743	1.832	0	12	48148
N. of domestic hours worked	0.278	0.916	0	12	47929
Works in the HH dwellings (Dummy)	0.073	0.259	0	1	48176
Works in agriculture (Dummy)	0.075	0.264	0	1	48176
Works in an hazardous activity (Dummy)	0.002	0.042	0	1	48176
Works in a shop (Dummy)	0.009	0.095	0	1	48176
Works in another activity (Dummy)	0.024	0.153	0	1	48176
School enrollment (Dummy)	0.474	0.499	0	1	48176
Non-food expenditure (per capita)	2530.795	5444.446	5.5	222100.797	48167
Food expenditure (per capita)	183.148	120.041	0.143	2284.798	48176
Total HH expenditure (per capita)	2713.948	5462.481	18.4	222501.469	48167
Regular employee paid to parents in kind (Dummy)	0.002	0.042	0	1	48176

Continued on next page

Table 6 – continued from previous page

Variable	Mean	Std. Dev.	Min.	Max.	N
Regular employee paid to parents in money (Dummy)	0.004	0.062	0	1	48176
Regular employee paid to the child in kind (Dummy)	0.001	0.029	0	1	48176
Regular employee paid to the child in money (Dummy)	0.003	0.059	0	1	48176
Casual employee paid to parents (Dummy)	0.002	0.046	0	1	48176
Casual employee paid to child (Dummy)	0.003	0.052	0	1	48176
Has his business (Dummy)	0.002	0.048	0	1	48176
Unpaid family worker in the HH (Dummy)	0.015	0.12	0	1	48176
Works in agric./livestock (Dummy)	0.142	0.349	0	1	48176
Works in another activity (Dummy)	0.011	0.104	0	1	48176
Children characteristics					
Sex	0.52	0.5	0	1	48173
Age	10.156	2.882	6	15	48176
Household characteristics					
Household size	9.068	3.491	2	34	48176
Male household head (Dummy)	0.984	0.124	0	1	48176
Age household head	44.877	12.275	9	99	48176
Average age in the household	19.295	4.826	7.4	57.667	48176
% of males in the household	0.511	0.14	0	1	48176
%of male children in the household	0.52	0.289	0	1	48176
% of male adults in the household	0.503	0.137	0	1	48176
Literacy of the household head (Dummy)	0.323	0.468	0	1	48176
Rural community (Dummy)	0.772	0.419	0	1	45275
N. of household assets	2.986	2.283	0	7	48176
Migration of a household member (Dummy)	0.072	0.259	0	1	48035
Shocks (Dummy)	0.49	0.5	0	1	48176
Distance to Pakistan	1.824	1.536	0	5.587	48176

Continued on next page

Table 6 – continued from previous page

Variable	Mean	Std. Dev.	Min.	Max.	N
District characteristics					
Average altitude of the district	1360.717	687.468	257.789	4763.95	47212
%of rural communities in the district	0.784	0.361	0	1	48176
% of HH with opium cultivation as main income source	0.045	0.161	0	1	48176
Average age in the district	20.325	1.589	14.22	26.149	48176
% of males in the district	0.512	0.026	0.383	0.641	48176
% of literate people in the district	0.243	0.134	0	0.679	48176
Conflict measures					
N. of conflicts	0.433	1.003	0	8.679	48176
IV	0.212	1.485	0	39.664	48176

4 Results and Discussion

4.1 The impact of conflict on the extensive margin of child labor supply

We study the impact of higher conflict intensity in Afghan districts on children (6-15 years old) participation in the labor force (the extensive margin of child labor supply). We estimate a version of equation 4 in which the effort is a binary variable ($e = [0; \neq 0]$), using both a LPM and an IV strategy. Table 7, panel A, reports the first stage of the IV regression, suggesting that there is a positive significant relationship between the Soviet conflict between 1979-1989 and the conflict in 2007-2008 at the district level. The F-test (larger than 10) also suggests that the instrument is valid.

Table 7, panel B, reports the marginal effect of conflict intensity on the probability that a child works (OLS, odd columns), and the estimated coefficient for the conflict intensity instrument (IV, even columns) for all children (cols. 1-2) and by gender (cols.

3-6). All OLS results suggest a negative relation between conflict and the probability that a child works. However, IV results suggest that these coefficients are downward biased. This is possibly because wage labor significantly decreases in conflict areas (Ciarli et al., 2015; Iyer and Santos, 2012). The IV coefficients suggest that conflict does not significantly increase the probability that a boy works but one more conflict per thousand inhabitants increases the probability of a girl working of about seven percentage points (significantly at the 5% level).

Concluding, the results seem to suggest that only girls increase their labor force participation in Afghan districts with higher conflict.

Table 7: **LPM and IV estimates of the effect of conflict intensity per district on child labor.**

PANEL A (first stage)						
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	N. of conflicts	N. of conflicts	N. of conflicts	N. of conflicts	N. of conflicts	N. of conflicts
IV		0.069***		0.071***		0.066***
		(0.0169)		(0.0173)		(0.0170)
F-test		14.56		10.56		21.07
PANEL B						
	(LPM)	(IV)	(LPM)	(IV)	(LPM)	(IV)
	Full sample	Full sample	Boys	Boys	Girls	Girls
N. of conflicts	-0.023**	0.050	-0.029***	0.033	-0.016	0.070**
	(0.010)	(0.033)	(0.010)	(0.035)	(0.012)	(0.032)
HH controls	Yes	Yes	Yes	Yes	Yes	Yes
District level controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	44,015	44,015	22,764	22,764	21,251	21,251
R^2	0.147	0.123	0.168	0.153	0.109	0.065

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10

4.2 The impact of conflict on the intensive margin of child labor supply

If a child works, how many hours does she devote to it? As suggested in Figure 2 in the theoretical framework, the answer depends on how conflict changes the adult/child wage ratio. Here we estimate a version of Equation 4 in which the effort is a continuous ($e \in (0, 1]$) where nearly no effort is nearly zero hours of work and maximum effort would be equivalent to eight hours of work. As we distinguish the effect of conflict by gender, we ran separate regressions for domestic and non-domestic activities.

Table 8 shows OLS and IV estimates of conflict (per 1000 inhabitants) on the number of daily non-domestic hours worked, for children that work. We focus on IV results, as they are more reliable. The IV regressions suggest that all children work less in non-domestic activities, however, the effect is significant (at 10%) only for girls (column 6): on average they work 0.33 non-domestic hours less per day when the district in which they live experiences one more conflict event (per 1000 inhabitants).

Instead, the effect of conflict on the number of hours that children devote to domestic activities is positive, but not significant, even when disaggregating by gender (Table 9).

To summarize, we find evidence that an increase in conflict intensity increases the likelihood that a girl works, but for those who work, the number of hours dedicated to non-domestic activities decreases: more girls work less hours. In the next section we investigate three potential mechanisms that might explain these results.

Table 8: **IV estimates of the effect of conflict intensity per district on the number of non-domestic hours worked by gender**

PANEL A (first stage)						
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	N. of conflicts	N. of conflicts	N. of conflicts	N. of conflicts	N. of conflicts	N. of conflicts
IV		0.079***		0.078***		0.079***
		(0.0147)		(0.0176)		(0.0167)
F-test		27.77		17.34		32.97
PANEL B						
	(OLS)	(IV)	(OLS)	(IV)	(OLS)	(IV)
	Hours	Hours	Hours	Hours	Hours	Hours
VARIABLES	Total sample	Total sample	Boys	Boys	Girls	Girls
N. of conflicts	-0.243***	-0.370	-0.219**	-0.286	-0.237**	-0.330*
	(0.084)	(0.243)	(0.087)	(0.358)	(0.095)	(0.174)
HH controls	Yes	Yes	Yes	Yes	Yes	Yes
District level controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,567	7,567	4,919	4,919	2,648	2,648
R^2	0.134	0.132	0.125	0.124	0.212	0.211

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10

Table 9: **IV estimates of the effect of conflict intensity per district on the number of domestic hours worked by both gender**

PANEL A (first stage)						
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	N. of conflicts	N. of conflicts	N. of conflicts	N. of conflicts	N. of conflicts	N. of conflicts
IV		0.079***		0.087***		0.075***
		(0.017)		(0.042)		(0.011)
F-test		21.99		4.319		49.59
PANEL B						
	OLS	IV	OLS	IV	OLS	IV
VARIABLES	Total sample	Total sample	Boys	Boys	Girls	Girls
N. of conflicts	0.012	-0.203	0.028	-0.673	0.006	0.079
	(0.085)	(0.251)	(0.069)	(0.735)	(0.141)	(0.117)
HH controls	Yes	Yes	Yes	Yes	Yes	Yes
District level controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,402	5,402	3,149	3,149	2,253	2,253
R^2	0.106	0.095	0.098	-0.039	0.141	0.140

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10

4.2.1 Potential Mechanisms

The framework that we employ in this paper suggests that children are more likely to work if the parent's compensations falls below subsistence level, or if a child's compensation increases relative to that of her parents. As suggested in the theoretical framework, and following the empirical evidence, we assume that most individuals work in self-employment (Ciarli et al., 2015).

Using the same IV strategy we estimate the effect of conflict on household expenditure, distinguishing between food and non-food. Table 12 in the Appendix suggests that households experience a drop in total per capita monthly expenditure of 640 Afghani (about 23.6%) for each additional conflict event every 1000 inhabitants. In other words, in higher conflict areas household's income is more likely to fall below subsistence level pushing parents to send their children to work, as predicted by the model.

Why females and not males? In part because the percentage of boys working is double with respect to girls. We also explore the possibility that girls drive the extensive margin results due to an increase in activities that take place within dwellings, i.e. more protected with respect to activities tat take place in shops, streets, or fields, more exposed to the direct consequences of conflict. We estimate equation 4 ($e = [0; \neq 0]$) for different activities, distinguishing between all activities (retributed and non) that take place in dwellings, agriculture, shops, and which are more hazardous. Tables 14 suggests that the probability of a girl working in the household's dwellings increases of about 3 percentage points as a response to a unitary increase in the measure of conflict, while the probability of a girl of working in a shop decreases of about 0.1 percentage points. We do find a significant effect on other economic sectors (agriculture, hazardous type of work such as constructions and quarrying and other) and for boys.[9] The increase in the probability of working only for girls seems to be partly explained that parents may prefer to increase activities that are better protected from conflict. It should be noted that these activities do not have to be households chorse, rather

[9] Table not reported for brevity, available upon request

activities that increase the household compensation, such as producing handicrafts and carpet weaving Lyby (2006).

Second, the framework also predicts that as children wage increase, they are more likely to reduce the time for leisure/school and increase the number of hours worked. We do not have information on wages, and as suggested most economic activities in Afghanistan are related to self-employment (mostly in subsistence agriculture). Therefore we estimate the effect of conflict on the adults/children working ratio. If the relative compensation of adults decreases with respect to children, we expect less adults to work, and the other way round if the relative compensation of children decreases. Table 13 suggests that conflict increases adult's labor supply in the household as more than proportionally with respect to children: the share of adults working increases by 28% for an increase in one conflict per 1000 inhabitants. As predicted by the model, we find that children (girls) reduce the number of non-domestic hours worked. Why girls? Because they tend to work in less remunerative activities than boys (Table 5), i.e. the difference with respect to parents' compensation is larger.

We also tested for the competing hypothesis that a decrease in the supply of schooling – for instance because of security reasons or because schools were destroyed – could decrease the opportunity cost of sending children to work. As the opportunity for leisure decrease, the framework employed in this paper would predict an increase in the probability that a child works, and an increase in the number of hours worked. The increase in girl's labor supply could be due to a lack of opportunity rather than to necessity. Employing the same IV strategy We estimated the effect of conflict on school enrollment, distinguishing by gender. Table 15 suggests that there is no significant impact of conflict on school enrollment. If anything, the effect is positive on girls. However, this results should be taken cautiously, and not as definitive. It is well possible that one cross section might not be sufficient to estimate the impact of conflict on schooling in a country that has been in conflict for several years (not enough geographical variation in school enrollment in one year).

Overall, these findings suggest that the *necessity* hypothesis drives the increase

in children labor supply when conflict intensity increases, but the number of hours worked falls as the relative remuneration of the new children entering in the labor market decreases. They are consistent with the literature suggesting that parents are *altruistic* and send children to work for *necessity* (Basu and Van, 1998; Manacorda, 2006, e.g.). Manacorda (2006), for instance, finds that a rise in the proportion of working children by household is associated with no variation in parent's labor supply and that parents redistribute entirely the returns from child labor to the children in the household.

4.3 Robustness checks

We ran a number of robustness checks (results available in Appendix C)

First, we estimated an IV Tobit model censored at zero hours worked to capture the impact of conflict on the extensive and the intensive margins combined (see Equation 6).

$$e_{ihd} = \begin{cases} 0 & (Y_{ihd}* < 0) \\ e_{ihd}* & (e_{ihd}* \geq 0) \end{cases} \tag{5}$$

$$e_{ihd}* = \alpha_1 + \alpha_2 X_{idt} + u_{ihd}, u_{ihd} \sim N(0, \sigma^2) \tag{6}$$

where $e_{ihd}*$ is a latent variable.

Table 16 in Appendix C suggests that one more conflict every 1000 inhabitants decreases the average daily number of non-domestic hours worked about 0.27 hours for girls at the 10% level of significance. The result clearly combine the impact of conflict on the extensive and the intensive margin, suggesting that the intensive margin prevails when counting the total number of worked hours, but does not allow us to disentangle the two effects.

The second robustness check addresses the concern that omitted geographical and ethnic factors may have influenced both the Soviet conflict in 1979-89 and child labor in 2007-2008. We reran our results controlling for the distance of the household from Pakistan, a good proxy for terrain ruggedness, altitude, and ethnicity. The results in

Table 17 show that the results on the extensive margin are unchanged.

Third, because Kabul (with a high conflict intensity with respect to other urban areas) may drive the overall results, we exclude it from the estimation. Table 18 shows that the impact of conflict on the extensive margin of child labor supply does not change.

The fourth robustness check addresses the concern that the Soviet conflict (1979-89) might be correlated to child labor in 2007/08 through the death of one of the parents. We added to the regressions a variable controlling for the presence of the father and of the mother in the household. Table 19 and 20 suggest that, despites the fact that the presence of the mother in the household decreases the probability that either a boy or a girl may work, conflict intensity has the same positive and significant effect on the probability for a girl to work.

Other robustness checks, not reported in the paper for brevity, were run using both a quadratic and an hyperbolic measure of conflict. The results are not significant, suggesting that these models do not fit the relationship between conflict and child labor.

5 Concluding remarks

In this paper we have analyzed the effect of conflict intensity in a district on both the extensive margin and the intensive margin of child labor supply (6-15), in the same district, in Afghanistan in 2007/08.

Extending Basu and Van (1998) framework to a conflict context, we show that parents may send their children to work when conflict drives income below the subsistence level, due to a reduction in the remuneration of their activity. However, the amount of work to which children in the labor market devote their time, may increase if conflict also increases the relative compensation of children with respect to adults and when the opportunity cost of working is low, perhaps because there is no access to school or other activities.

Our results suggest that in conflict affected areas girls only are more likely to join the labor force but work fewer daily non-domestic hours per week. The magnitude of the effects is significant: a one unit increase in conflict intensity (one conflict over 1000 individuals in the district) increases the probability that a girl works by about 7 percentage points. The decrease in the number of hours worked in non-domestic activities per per capita conflict event is lower: 0.3 hours per week. We do not find any significant effect on domestic hours worked (household chores) and on boys.

We provide evidence that the increase in the extensive margin of child labor may indeed be due to a fall in household's income: household total per capita expenditure drops by 21.5% for an additional conflict event (per 1000 inhabitants). The increase in the number of working girls may be due to the fact that hey work on activities that are more shielded from conflict, within the household, in both paid and subsistence activities. We also provide evidence that the decrease in the intensive margin of child labor, instead, may be due to an increase in the relative compensation of adults with respect to children, as suggested by the positive effect of conflict events on the ratio between adults and children working. Instead, we find no evidence for the opportunity cost argument. In our results conflict does not significantly affect school enrollment.

War worsens households economic conditions, pushing girls (in Afghanistan) to work, although their work is less intensive. Girls end up working more in both paid and subsistence activities that take place in the household dwellings (carpet weaving, farming). This effect should be considered when regulating child labor, increasing the regulation of indoor working activities in conflict-ridden states.

References

Aich, Valentin, Noor Akhundzadah, Alec Knuerr, Ahmad Khoshbeen, Fred Hattermann, Heiko Paeth, Andrew Scanlon, and Eva Paton, "Climate Change in Afghanistan Deduced from Reanalysis and Coordinated Regional Climate Downscaling Experiment (CORDEX),ÄîSouth Asia Simulations," *Climate*, may 2017, *5* (2), 38.

Akresh, Richard and Damien De Walque, "Armed conflict and schooling: Evidence from the 1994 Rwandan genocide," *World Bank Policy Research Working Paper Series, Vol*, 2008.

Altonji, Joseph G and David Card, "The effects of immigration on the labor market outcomes of less-skilled natives," in "Immigration, trade, and the labor market," University of Chicago Press, 1991, pp. 201–234.

Bar, Talia and Kaushik Basu, "Children, education, labor, and land: in the long run and short run," *Journal of the European Economic Association*, 2009, *7* (2-3), 487–497.

Bartel, Ann P, "Where Do the New U.S. Immigrants Live?," *Journal of Labor Economics*, 1989, *7* (4), 371–91.

Basu, Kaushik and Pham Hoang Van, "The economics of child labor," *American economic review*, 1998, pp. 412–427.

Bove, Vincenzo and Evelina Gavrilova, "Income and Livelihoods in the War in Afghanistan," *World Development*, aug 2014, *60*, 113–131.

Bundervoet, Tom, "Assets, Activity Choices, and Civil War: Evidence from Burundi," *World Development*, jul 2010, *38* (7), 955–965.

Calì, Massimiliano and Sami H. Miaari, "The Labor Market Impact of Mobility Restrictions : Evidence from the West Bank," Policy Research Working Paper 6457, The World Bank, Washington D.C. may 2013.

Chamarbagwala, Rubiana and Hilcías E Morán, "The human capital consequences of civil war: Evidence from Guatemala," *Journal of Development Economics*, 2011, *94* (1), 41–61.

Chen, Siyan, Norman V Loayza, and Marta Reynal-Querol, "The aftermath of civil war," *The World Bank Economic Review*, 2008, *22* (1), 63–85.

Ciarli, Tommaso, Chiara Kofol, Carlo Menon et al., "Business as Unusual. An Explanation of the Increase of Private Economic Activity in High-Conflict Areas in Afghanistan," Technical Report, Spatial Economics Research Centre, LSE 2015.

(dataset1) Ministry of Rural Rehabilitation and Development , Central Statistics Organization (Afghanistan), "Afghanistan National Risk and Vulnerability Assessment 2007-2008," `http://ghdx.healthdata.org/record/afghanistan-national-risk-and-vulnerability-assessment-2007-2008`.

(dataset2), EST WikiLeaks , "The Afghan War Diary (2004-2010)," `https://wikileaks.org/wiki`.

(dataset3), Kalev H. Leetaru , "Global Dataset on Events, Location and Tone (GDELT)," `http://gdeltproject.org/data.html`.

Deininger, K., "Causes and consequences of civil strife: micro-level evidence from Uganda," *Oxford Economic Papers*, oct 2003, *55* (4), 579–606.

Di Maio, Michele and Tushar K Nandi, "The effect of the Israeli-Palestinian conflict on child labor and school attendance in the West Bank," *Journal of Development Economics*, 2013, *100* (1), 107–116.

Edmonds, Eric V, "Child labor," *Handbook of development economics*, 2007, *4*, 3607–3709.

Ghiasy, Richard, Jiayi Zhou, and Henrik Hallgren, "Afghanistan's private sector," October 2015.

Hausmann, Ricardo, César A Hidalgo, Sebastián Bustos, Michele Coscia, Alexander Simoes, and Muhammed A Yildirim, *The Atlas of Economic Complexity: Mapping Paths to Prosperity*, Cambridge, MA: MIT Press, 2014.

ILO, "Marking progress against child labour - Global estimates and trends 2000-2012," 2013.

Iyer, Lakshmi and Indhira Santos, "Creating Jobs in South Asia's Conflict Zones," Policy Research Working Paper 6104 June, World Bank, Washington DC 2012.

Kondylis, Florence, "Conflict displacement and labor market outcomes in post-war Bosnia and Herzegovina," *Journal of Development Economics*, nov 2010, *93* (2), 235–248.

Leon, Gianmarco, "Civil conflict and human capital accumulation the long-term effects of political violence in perú," *Journal of Human Resources*, 2012, *47* (4), 991–1022.

Lind, Jo Thori, Karl Ove Moene, and Fredrik Willumsen, "Opium for the Masses? Conflict-Induced Narcotics Production in Afghanistan," *Review of Economics and Statistics*, oct 2014.

Lyby, Eric, *Microfinance and Gender Roles in Afghanistan*, World Bank, 2006.

Manacorda, Marco, "Child labor and the labor supply of other household members: Evidence from 1920 America," *The American economic review*, 2006, *96* (5), 1788–1801.

O'Loughlin, John, Frank D W Witmer, Andrew M Linke, and Nancy Thorwardson, "Peering into the Fog of War: The Geography of the WikiLeaks Afghanistan War Logs, 2004-2009," *Eurasian Geography and Economics*, 2010, *51* (4), 472–495.

Rodriguez, Catherine and Fabio Sanchez, "Armed conflict exposure, human capital investments, and child labor: evidence from Colombia," *Defence and peace economics*, 2012, *23* (2), 161–184.

Saiz, Albert, "Room in the kitchen for the melting pot: Immigration and rental prices," *Review of Economics and Statistics*, 2003, *85* (3), 502–521.

Shemyakina, Olga, "The effect of armed conflict on accumulation of schooling: Results from Tajikistan," *Journal of Development Economics*, 2011, *95* (2), 186–200.

Swee, Eik Leong et al., "On war and schooling attainment: The case of Bosnia and Herzegovina," *Households in Conflict Network Working Paper*, 2009, *57*.

Zammit-Mangion, Andrew, Michael Dewar, Visakan Kadirkamanathan, and Guido Sanguinetti, "Point process modelling of the Afghan War Diary," *Proceedings of the National Academy of Sciences*, 2012, *109* (31), 12414–12419.

A Data Description

A.1 Variable description

Table 10: **Variables description**

Variables	Description
Dependent variables	
Working child (Dummy)	Equal to 1 if the child works, 0 otherwise
N. of domestic hours worked	Average n. of domestic hours worked by the child per day in the past 7 days by the child on household chores, or tending children, cooking, fetching water or other household chores
N. of domestic hours worked	Average n. of hours worked by the child per day in the past 7 days
Works in the HH dwellings (Dummy)	Equal to 1 if the child works in the house
Works in agric. (Dummy)	Equal to 1 if the child works in agriculture
Works in an hazardous activity (Dummy)	Equal to 1 if the child works in a hazardous activity
Works in a shop (Dummy)	Equal to 1 if the child works in a shop
Works in another activity (Dummy)	Equal to 1 if the child works in other activities
School enrolment (Dummy)	Equal to 1 if the child is enrolled in school, 0 otherwise
Non-food expenditure (per capita)	Non-food expenditure (per capita) in the previous 30 days in Afghani
Food expenditure (per capita)	Food expenditure (per capita) in the previous 30 days in Afghani
Total expenditure (per capita)	Total HH expenditure (per capita) in the previous 30 days in Afghani
Regular employee paid to parents in kind (Dummy)	Equal to 1 if the child is a regular employee paid to parents in kind, 0 otherwise
Regular employee paid to parents in money (Dummy)	Equal to 1 if the child is a regular employee paid to parents in money, 0 otherwise
Regular employee paid to the child in kind (Dummy)	Equal to 1 if the child is a regular employee paid to the child in kind, 0 otherwise
Regular employee paid to the child in money (Dummy)	Equal to 1 if the child is a regular employee paid to the child in money, 0 otherwise
Casual employee paid to parents (Dummy)	Equal to 1 if the child is a casual employee paid to parents, 0 otherwise
Casual employee paid to child (Dummy)	Equal to 1 if the child is a casual employee paid to child, 0 otherwise
Has his business (Dummy)	Equal to 1 if the child has is business, 0 otherwise
Unpaid family worker in the HH (Dummy)	Equal to 1 if the child is an unpaid family worker, 0 otherwise
Works in agric./livestock (Dummy)	Equal to 1 if the child works in agriculture/livestock, 0 otherwise
Works in another activity (Dummy)	Equal to 1 if the child works in another activity, 0 otherwise
Household variables	
Household size	Household size
Male head (dummy)	Equal to 1 if the household head is a male, 0 otherwise
Age of the household head	Age of the HH head
Average age in the household	Average age of the HH members
% of male children in the household	% of male children in the household
% of male adults in the household	% of male children in the household
Literacy of the household head (Dummy)	Equal to 1 if the HH head is literate, 0 otherwise
Rural (Dummy)	Equal to 1 if the HH lives in a rural community, 0 otherwise
N. of household assets	Number of assets in the HH
Migration of a household member (Dummy)	Equal to 1 if any HH member migrated in the past year, 0 otherwise
Shocks (Dummy)	Equal to 1 if the HH experienced a shock in the previous year, 0 otherwise
Total HH expenditure (per capita)	Total household expenditure in the past 30 days (measured in Afghani)
Food expenditure (per capita)	Food household expenditure in the past 30 days (measured in Afghani)
Non-food expenditure (per capita)	Non-food household expenditure in the past 30 days (measured in Afghani)
Distance to Pakistan	Distance from the household to Pakistan in Km.
School enrolment missing (Dummy)	Equal to 1 if the school enrolment dummy is missing, 0 otherwise
Individual variables	
Age	Age of the individual
Sex (Dummy)	Sex of the individual
Conflict variables (defined more in detail in the Appendix)	
N. of conflicts	Number of conflict events in the district (normalized by population per district)
Instrumental variable	
IV	N. of conflict events in the district from 1979 to 1989 (GDELT data)
District variables	
% of rural communities	Share of rural communities in the district
% of households with opium cultivation as a main income	Average number of households whose first source of income is opium cultivation
Avg. age	Average age in the district
% of males	Share of males in the district
% of literate adults	Share of literate adults in the district

A.2 Conflict data

Activities	definition
AIR ASSAULT	conflict air operations
AMBUSH	ambushes that most of the times end up with wounded/killed and with explosions
AMF-ON-ANA	events where a fire, even if friendly, occurred
ANA-ON-ANP	events where a fire, even if friendly, occurred
ARSON	actions where buildings/infrastructures were set on fire
ASSASSINATION	events where people were killed
ATTACK	events where someone was attacked. Not necessarily involves wounded/killed
BLUE-GREEN	events where there is a fire
BLUE-BLUE	events where there is a fire
BLUE/WHITE	events where there is a fire
BREACHING	events with fire and possibly casualties
CARJACKING	mainly enemies hijacking cars or other private vehicles
CCA	diverse suspicious events
CAS	events where helicopters are involved in the attack
CLOSE AIR SUPPORT	events where helicopters are involved in the attack
COUNTER INSURGENCY	violent actions
COUNTER MORTAR FIRE	events where there is a fire
CRIMINAL ACTIVITY	it can include explosions, theft, wounded journalists during attacks
DELIBERATE ATTACK	it includes diverse violent actions, sometimes with wounded/killed individuals
DIRECT FIRE	events where there is a fire
DOWNED AIRCRAFT	it describes operations where aircrafts were downed
DRUG OPERATION	it can include fires and violent actions
ENEMY ACTION	it describes violent events with fire
ESCALATION OF FORCE	It describes violent actions with possibly wounded/killed
GREEN-BLUE	it describes events where there is a fire
GREEN-GREEN	it describes events where there is a fire
GREEN-WHITE	it describes events where there is a fire
DF COUNTER FIRE	it describes events where there is a fire

KIDNAPPING	it describes operations where someone was kidnapped
LOOTING	it describes operations where a loot took place
MINE STRIKE	events where there is an explosion
MURDER	it describes operations where someone was murdered
IED AMBUSH	attack on US army using Improvised Explosion Device
IDF INTERDICTION	prediction of a future fire/bombing while not happened yet
IED FOUND/CLEARED	IED detonated by the US military
IED EXPLOSION	mainly bombs, or suicide bombs against military and civilians
INTERDICTION	suicide bombers are spot and blocked, arrested, or killed, sometimes the IED explodes
SNIPER OPERATIONS	fire starts from an hidden place
TRIBAL	fire events. Violent tribal disputes
TRIBAL FEUD	violent tribal disputes
UAV	(Unmanned Aerial Vehicle): Mixed events that can include fire, wounded/killed
POLICE ACTIONS	they can be either violent or not. They can include fire
MEDEVAC(LOCAL NATIONAL	medical interventions
MINE FOUND/CLEARED	non-violent event
MOVEMENT TO CONTACT	movement in order to contact the enemy. It can be violent but not always
MUGGING	it describes operations where someone was mugged
NARCOTICS	disruption of a major drug labs
NBC	event that describes a show of force
NONE SELECTED	diverse events some of them violent
OTHER	conflict related event, with fire, or explosion
OTHER (HOSTILE ACTION)	events such as kidnapping/killing/robbery
OTHER DEFENSIVE	it can include fire/violent events
OTHER OFFENSIVE	it can include fire/violent events
POLICE ACTIONS	they can be either violent or not. They can include fire
POLICE INTERNAL	violent events with fire, wounded/killed
PLANNED EVENT	mixed evidence but mostly violent events
PREMATURE DETONATION	explosive events
RAID	violent events with possibly wounded/killed individuals
RPG	rocket-propelled grenade actions

SAFIRE	surface to air fire
SEARCH AND ATTACK	violent actions with possibly wounded/killed individuals
SECTARIAN VIOLENCE	violent events such as suicide bombers
SHOW OF FORCE	it reports either battle events or events where there is a fire
SMALL UNIT ACTIONS	violent actions possibly with direct fire, possibly with wounded/killed individuals
SNIPER OPS	fire started from an hidden place
UNKNOWN EXPLOSION	explosive event
VANDALISM	diverse disruptive events
VOGE	visual observation of ground explosion

Table 11: **List of categories included among the relevant conflict events**

B A Graphic Explanation

In this section we study the effect of a reduction in w_a graphically for the simplest possible household, with one child $M = 1$, who consumes half of what is consumed by the parents ($b = 1/2$), and for which subsistence is equal to one ($s = 1$).

Figure 1 shows the different areas of no work (blue area above the $e = 0$ segment), maximum work (red area below the $e = 1$ segment) and the area in which the effort may change between 0 and 1 (light grey area between the $e = 0$ and the $e = 1$ segments). The graph shows that, for our one child example household, when we consider children's compensation, a child might be sent to work even if the household consumption is above subsistence level. In particular, children that are similar to adults (grown up and skilled enough to have the same compensation) always work to some extent ($w_a = w_c$ segment). As a child's compensation reduces, they are less likely to be sent to work, *cæteris paribus*. For instance, a child that earns half of her parents (grey line $w_a = 2W_c$) will go to work if the parents' compensation is below twice the budget constraint. Similarly, when parents' compensation is below the budget constraint, the probability that the child consumes no leisure increases with her compensation.

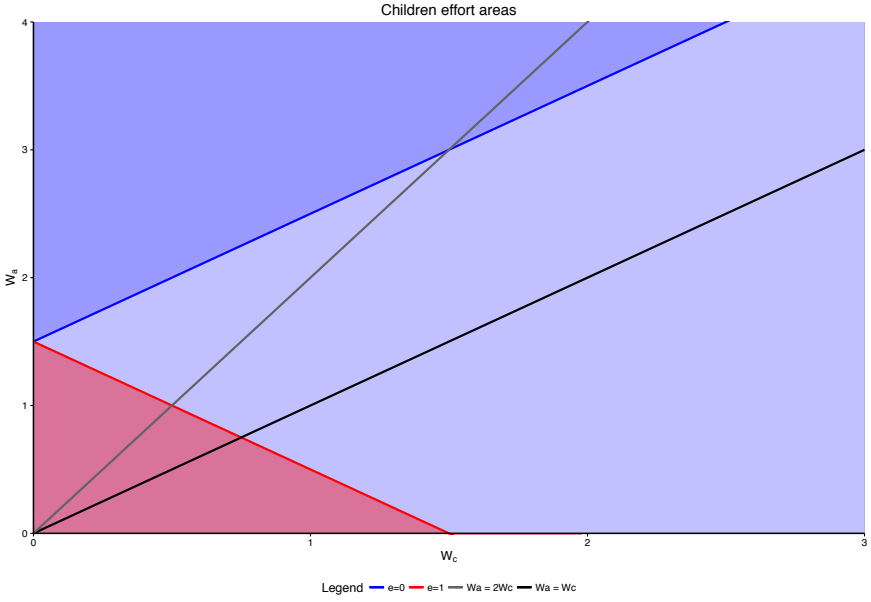


Figure 1: Areas of children total and zero effort.

Changing the parameters defining the household does not affect the main story. An increase in the subsistence level of consumption (s), or in a child's equivalent consumption (b), simply shifts both curves $e = 0$ and $e = 1$ upwards, which as we know implies that a child will be sent to work for a relatively higher w_a. An increase in the number of children (M) shift both curves upwards and increases their slope. This affects the role of w_a: a a household with two children will always send them to work if their salary is half of their parents'.

Next, to assess the amount of effort that children devote to labour ($e_m \in [0, 1]$) or, the amount of time that they subtract from leisure and education ($1 - s$), we study graphically the third condition (between the blue $e = 0$ segment and the red $e = 1$ segment) for different levels of w_a and w_c, and for the same one child household defined above. Figure 2 uses a density plot to represent the level of e for different combinations of w_a and w_c, for values of $e_m \in [0, 1]$.

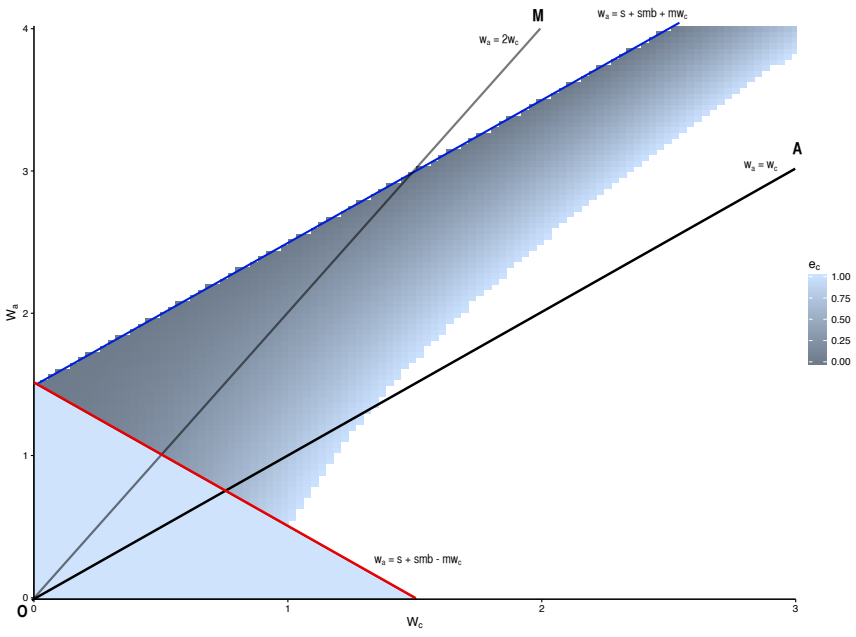


Figure 2: Child intensive margin for different combinations of w_a and w_c.

Focussing again on the child whose compensation is half of that of the parents, as w_a falls below twice the subsistence level, she starts to exert a small effort. The effort increases if w_a reduces even more. However, if w_c falls more than proportionally than w_a, the child will reduce her effort and work less hours.

To summarise, an increase in conflict reduces w_a and w_c. If conflict does not change the redistribution between w_a and w_c, an increase in conflict implies an increase in the number of children working in the household to compensate for the loss in consumption. That is, conflict has a positive effect on the children employment extensive margin.

With reference to Figure 1 a grown up child, with a productivity similar to an adult, works even in the absence of conflict. Young children, instead, are sent to work only if conflict reduces compensations by a significant amount. The larger the difference between w_a and w_c the fewer children work.

With reference to Figure 2 on the intensive margin, if w_c reduces more than proportionally with respect to w_a children work less, as the opportunity cost of reducing leisure is not compensated by the increase in household income. Whether conflict in Afghanistan has a larger effect on w_a or on w_c can be empirically tested looking at the change in the share of adults over children working in a household due to conflict.

C Further Results and Robustness Checks Tables

Table 12: **Impact of conflict on households' expenditure per capita in the last 30 days (measured in Afghani)**

VARIABLES	(1) non-food expenditure p.c.	(2) food expenditure p. c.	(3) household expenditure p. c.
N. of conflicts	-615.517***	-24.678**	-640.196***
	(173.236)	(11.463)	(174.833)
Observations	12,445	12,445	12,445
R^2	0.038	0.153	0.039

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10

Table 13: **IV estimates of conflict on the ratio between adult working and children working**

	(1) (IV)
VARIABLES	Adults/children in work in the HH
N. conflicts	0.280***
	(0.078)
HH controls	Yes
District level controls	Yes
Observations	12,514
R^2	0.220

*** p<0.01, ** p<0.05, * p<0.1

The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10. First stage results available on request

Table 14: **IV estimates of the impact of conflict on child labor by type of work (girls)**

VARIABLES	(1) (IV) HH dwellings	(2) (IV) agriculture	(3) (IV) hazardous	(4) (IV) shop	(5) (IV) other
N. of conflicts	0.030*	0.007	-0.000	-0.001**	-0.002
	(0.017)	(0.012)	(0.000)	(0.000)	(0.002)
Observations	44,015	44,015	44,015	44,015	44,015
R^2	0.069	0.032	0.001	0.001	0.007

*** p<0.01, ** p<0.05, * p<0.1

The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10. First stage results available on request

Table 15: **IV estimates of conflict intensity per district on schooling (school enrollment)**

VARIABLES	(1) school enrol. total	(2) school enrol. boys	(3) school enrol. girls
N. conflicts	0.002	-0.008	0.013
	(0.009)	(0.015)	(0.011)
Observations	44,015	22,764	21,251
R^2	0.899	0.900	0.891

*** p<0.01, ** p<0.05, * p<0.1

The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10. First stage results available on request

C.1 Robustness checks

Table 16: **Tobit marginal effects of conflict intensity per district on children non-domestic hours worked.**

PANEL A (first stage)			
	(1)	(2)	(3)
	(IV)	(IV)	(IV)
VARIABLES	Total	Boys	Girls
N. of conflicts	0.187	0.110	0.268*
	(1.42)	(0.73)	(2.21)
HHcontrols	Yes	Yes	Yes
District level controls	Yes	Yes	Yes
Observations	44015	22764	21251

Marginal effects; t statistics in parentheses
(d) for discrete change of dummy variable from 0 to 1
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10

Table 17: **IV estimates of the effect of conflict intensity per district on child labor. Conflict intensity is the number of conflicts normalised by population per district (NRVA data) - Distance from Pakistan included**

	(1) Works Full sample	(2) Works Boys	(3) Works Girls
N. of conflicts	0.067*	0.056	0.081**
	(0.040)	(0.044)	(0.039)
HH controls	Yes	Yes	Yes
District level controls	Yes	Yes	Yes
Observations	44,015	22,764	21,251
R^2	0.116	0.148	0.055

*** p<0.01, ** p<0.05, * p<0.1

The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10. First stage results available on request

Table 18: **IV estimates of the effect of conflict intensity per district on child labor. Conflict intensity is the number of conflicts normalised by population per district (NRVA data) - Kabul district excluded**

	(1) Works Full sample	(2) Works Boys	(3) Works Girls
N. conflicts	0.0502	0.0343	0.0697**
	(0.0325)	(0.0347)	(0.0324)
HH controls	Yes	Yes	Yes
District level controls	Yes	Yes	Yes
Observations	41,207	21,328	19,879
R^2	0.120	0.149	0.062

*** p<0.01, ** p<0.05, * p<0.1

The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10. First stage results available on request

Table 19: **IV estimates of the effect of conflict intensity per district on child labor. Conflict intensity is the number of conflicts normalised by population per district (NRVA data) - Controlling for the presence of the mother in the household**

	(1) Works Full sample	(2) Works Boys	(3) Works Girls
N. conflicts	0.0500	0.0335	0.0699**
	(0.0326)	(0.0348)	(0.0324)
MothHH	-0.0406***	-0.0566***	-0.0333*
	(0.0150)	(0.0211)	(0.0175)
HH controls	Yes	Yes	Yes
District level controls	Yes	Yes	Yes
Observations	44,015	22,764	21,251
R^2	0.123	0.153	0.065

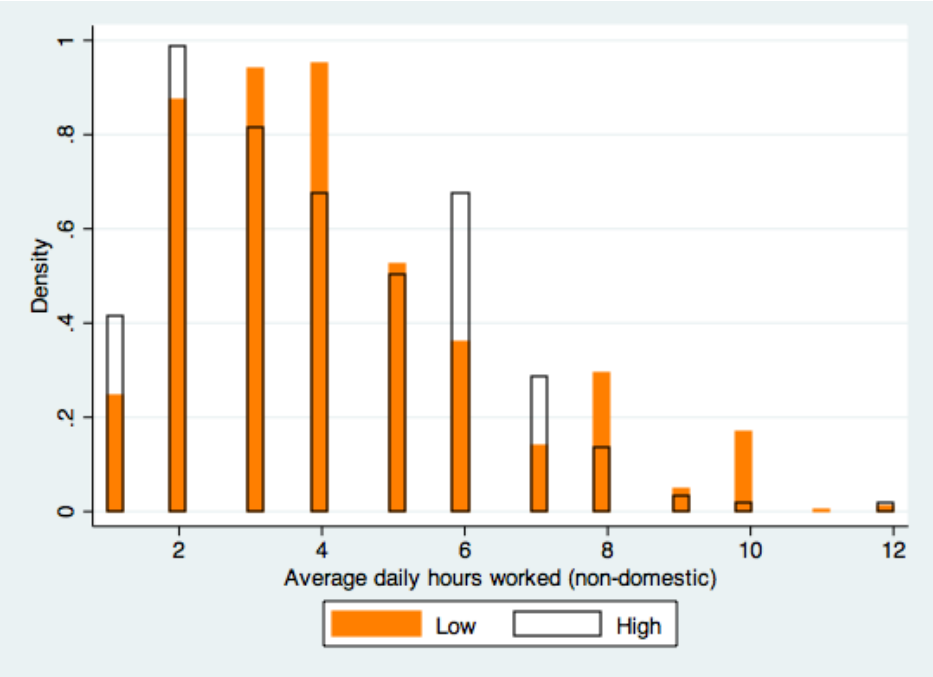
Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10

Table 20: **IV estimates of the effect of conflict intensity per district on child labor. Conflict intensity is the number of conflicts normalised by population per district (NRVA data) - Controlling for the presence of the father in the household**

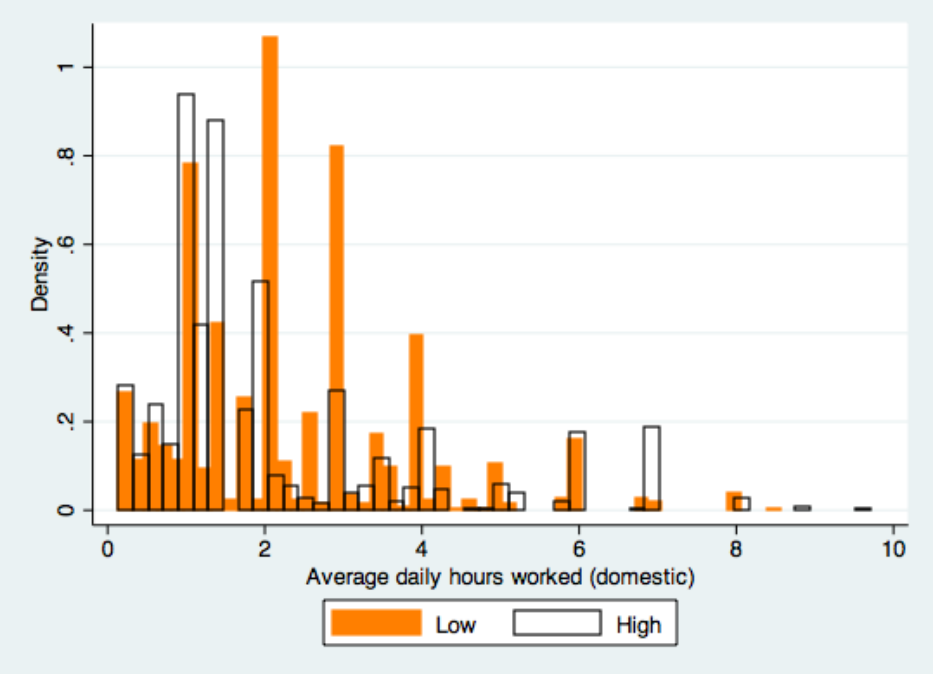
	(1) Works Full sample	(2) Works Boys	(3) Works Girls
N. conflicts	0.0497	0.0335	0.0695**
	(0.0327)	(0.0349)	(0.0324)
FathHH	-0.0103	-0.0335**	0.00661
	(0.0115)	(0.0157)	(0.0133)
HH controls	Yes	Yes	Yes
District level controls	Yes	Yes	Yes
Observations	44,015	22,764	21,251
R^2	0.123	0.153	0.065

Notes: Cluster robust standard errors in parentheses, the cluster is the district.
*** p<0.01, ** p<0.05, * p<0.1
The dependent variables are variables defined at the child level. Conflict measures instead are defined at the district level. All the conflict measures are normalised by population (a unit of conflict is 1/1000 inhabitants). Estimated with the variables described in Table 10

D Extra Figures



(a) Average n. of non-domestic daily hours worked in the week prior to the survey



(b) Average n. of domestic daily hours worked in the week prior to the survey

Figure 3: **Distribution of non-domestic and domestic hours worked both in low and high conflict areas**