Conflict, economic shock and child labour in Palestine

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Abstract:

This paper studies the impact of Palestine-Israel conflict on child labour in Palestine. The conflict has resulted in massive job loss of Palestinian workers in Israel. We estimate the probability that a Palestinian child starts working when the household suffer economic shock due to the intensity of conflict. The paper uses longitudinal employment survey from the Palestinian Labour Force Survey (LFS) for the period 2000 to 2006 to analyse the impact of household economic shocks on the employment transition of children (10-16 years) in Palestine. The particular economic shock we consider in this paper is the job loss of Palestinian workers in Israel. Taking advantage of the rotating panel structure of the LFS, we compare households in which the head looses his job in Israel during 2 consecutive quarters with households in which the head is continuously employed in Israel. Probit regressions indicate that household head's job loss in Israel significantly increases the probability of child labour. The effect can be as large as 64% on the probability of working for 16 years old boys. In contrast, household head's job loss after a year does not have a significant effect, suggesting that the result is not due to unobservable characteristics of households that suffer the economic shock. The results suggest that economic shock for even relatively well-off households can have adverse consequence for children and highlights the importance of the Palestine-Israel conflict as an explanation of child labour dynamics in Palestine.

Keywords: Child labour, Palestine-Israel conflict, Economic shock, Job Loss, Labour Force Survey.
JEL Classification: J22, C25, D13, O53.

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1. Introduction

Traditionally, child labour has been viewed as a consequence of poverty. That poverty is the main cause for child labour indeed seems very reasonable. The formal counterpart of this idea is the 'luxury axiom' introduced by Basu and Van (1998). The axiom states that parents send their children to work when household income is below a certain level. While the luxury axiom is considered the reference point in the theoretical literature, there is no consensus in the empirical literature on the relationship between poverty and child labour. In fact, although child labour is probably a positive function of household poverty, it is also likely to be determined by a host of other socio-economic factors. Among these there are: access to school, intergenerational expectations, inequality, and employment opportunities. In particular, a recent strand of research has started exploring the possibility that child labour is a short run response to a negative shock affecting the household. The latter then would add to household poverty and to the socio-economic factors listed above as causes of child labour.

In this paper we analyze the extent to which child labour in Palestine is caused by a negative economic shock affecting the household. The particular economic shock we consider in this study is the job loss of household head in Israel. We focus on the job loss in Israel because of the exogenous nature of the shock with respect to children's outcome in Palestine. We use longitudinal employment survey data in order to estimate the causal effect of household head's job loss in Israel on his child's employment transition. The analysis includes a representative sample of 10-16 years old boys from the Palestinian Labour force Survey for the period 2000-2006. This unique dataset obtained by merging information from the Palestinian Labour Force Survey (LFS) and a separate data on 10-16 years old children, both provided by the Palestinian Central Bureau of Statistics (PCBS). Palestine case provides a perfect context for testing the hypothesis that child labour may be related to negative economic shocks. Indeed, the Palestinian labour market has been severely affected by the conflict with Israel. We exploit the panel structure of the Palestinian LFS to study whether child labour transition is affected by an episode of household head's job loss in Israel. Our paper is one of the few contributions in the child labour literature that uses longitudinal dataset in order to estimate the causal effect of economic shock on child labour. To the best of our knowledge this is the first paper that analyzes this issue for Palestinian children.

The paper is structured as follows. In the next section, we briefly review the literature which is relevant to the present paper, and we set out the background of our study. In Section 3 we describe our dataset and the trends of the main variables of interests. Section 4 presents the estimation strategy and the results of our analysis. Section 5 concludes the paper.

2. Literature and conceptual background

The effect of shocks on the supply of children's work in developing countries is subject of a recent but growing literature. In parallel a literature focusing on the effect of economic shocks on school attendance is flourishing (see among others Funkhouser 1999; Fallon and Lucas 2002; Thomas et al. 2004; Parker and Skoufias 2006).

There is now robust evidence indicating that negative economic shocks do in fact matter for household decisions concerning children's work and education.[1] The seminal paper by Jacoby and Skoufias (1997) finds that in rural India parents facing an unexpected decline in crop income withdraw their children from school. Subsequent research has shown that the effect of shocks on the probability of children be sent to work is related to existence of credit constraint and the availability of savings to be used as buffer stocks. Using cross-country data, Dehejia and Gatti (2005) find a significant negative relationship between child labour and access to credit. Cross-country level results indicate that, in the absence of developed financial markets, households appear to resort substantially to child labour in order to cope with income variability. Beegle et al. (2006) find that a crop shock leads to a significant increase in child labour and a decrease in school enrolment. Such effects, moreover, are negatively related to the level of assets held by the household. The paper argues that the reason the household uses child labour to cope with income shocks is because of credit constraint and the lack of buffer stocks.

Other studies established that also macroeconomic shocks and political instability appear to play a role in determining children's labour supply (Duryea and Arends-Kuenning 2003**;** Di Maio and Nandi 2009). Recent evidence shows the consequence of the shock affecting household may depend on their specific nature. In the context of Guatemala, Guarcello et al. (2009) show two interesting results. First, households adjust the activity status of children in response to idiosyncratic shocks and natural disasters. Second, the effects of shocks on children's activities are long-lasting since children who are sent to work are subsequently less likely to return to school. These results on child labour as response to transitory shocks indicates an increase of the probability of child starting working and reducing school attendance. However, the reverse process is not so likely.

[1] Edmonds (2006) is the only paper that studies the effect of a positive income shocks. Using data from South Africa, it is shown that an increase in the pension income, which is entirely anticipated, significantly decreases child labour and increases school attendance of 10-17 years old children.

Few studies have focused on the economic shock caused by job loss of household head. This is partly due to the shortage of longitudinal data sets from developing countries that provide an opportunity for cause-effect analysis. Parker and Skoufias (2005) study the effects of adult job loss, divorce, and marriage on the time allocation of both adults and children. They conclude that children appear to be largely unaffected by household economic shocks.[2] Duryea et al. (2007) find that short-run economic shock at the household level affect the child labour transition in Brazil. They measure of economic shock by household head's transition from employment to unemployment and find that child labour appears after the household economic shock. The loss of employment of the household head increases the probability that a child enters the labour force, drops out from school and fails to advance in school. Their panel data allows then to infer that in absence of credit market household that are unable to weather short-run economic shock use child labour as instrument in order to smooth consumption.

Our study contributes to this last line of research by investigating whether child labour in Palestine responds to negative shocks affecting the household. We focus on a particular shock – job loss of household head in Israel and subsequent employment or unemployment in Palestine. The choice of this shock, more precisely exclusion of household head's labour market transition within Palestine, warrants some comments. We argue that job loss in Israel is an exogenous shock that allows causal interpretation of our results. Since previous studies have shown that child labour is affected by local labour market dynamics. Hence, household head's labour market transition in Palestine may be caused by a set of factors that also affect child labour. In presence of common factors for both explanatory and explained variable the estimated effect can be largely an indication of confounding effects, far from being causal effect. On the side of choice for the transition from job in Israel to employment or unemployment in Palestine as measure of exogenous shock, a large body of literature has documented that recent displacement of Palestinian workers from Israel is to be attributed to the intensity of the Israel-Palestine conflict. Since the beginning of the second Intifada in September 2000, the border between these two countries has occasionally been closed, causing the trend of job loss of Palestinian workers who used to commute daily to their workplace in Israel. The evidence is apparent from recent LFS data of Palestine. It shows that almost 1 fourth of Palestinian workers were working in Israel in 1999. The percentage has come down to around 10% in 2006 (more below). For a more systematic evidence on

2 More specifically, they find some evidence that job loss by the head leads to an increase in work activity of girls, though they find no significant effect on time allocated to school or leisure.

exogeneity we regress the quarterly percentage of Palestinian workers working in Israel on number of days the border remained closed and wage rates in Palestine. We find that number of days of border closure has a significant negative effect on the percentage of Palestinian workers working in Israel, whereas wage in Palestine does not have any significant effect. We conclude from this exercise that our measure of economic shock, job loss in Israel, is exogenous - affected by factors not related to local labour market conditions that can affect child labour in Palestine.

Our identification strategy is to exploit the household head's job transition from Israel to Palestine during the periods of conflict. Hence, we use data after the beginning of the 2nd Intifada in the construction of our measure of shock. Our estimation strategy (detail below) is to exploit longitudinal dimension of the data to focus on the timing of shock and child labour. Our measure of shock is the event when a household head working in Israel in 1st quarter is found to be employed or unemployed in Palestine in 2nd quarter. It is important to note since we don't observe employment status on a narrower interval, that the job loss in Israel does not necessarily imply unemployment. In fact a considerable percentage of household heads who where working in Israel in 1st quarter is observed to be self-employed or employed in Palestine in 2nd quarter. We consider these transitions as shocks as well, since average wage of Palestinian worker working in Palestine is almost half the average wage of Palestinian workers working in Israel.

3. Data and Trends

Our analysis is based on data from the Palestinian Labour Force Survey. The survey is organized with a rotating panel design where respondent households are surveyed for two consecutive quarters, dropped from the sample for two quarters, and then brought back in for two final quarters. Though the survey is not designed for longitudinal analysis, the rotating design makes it possible to match individuals across waves. For descriptive analysis, we use data for a larger period - from the third quarter of 1999 to the fourth quarter of 2006. However, our estimation uses data from the period of intensified conflict (since the beginning of the 2nd Intifada).

Since the survey is not particularly designed for longitudinal analysis, attrition across waves is relatively high. A brief analysis of sample attrition is presented in Appendix A. Given the scarcity of longitudinal data from middle-east countries, and given the large time span, and methodological consistency of Palestinian LFS, we assume that the data are worth using to analyze short-run adjustment to economic shocks. Though potential selection biases in the

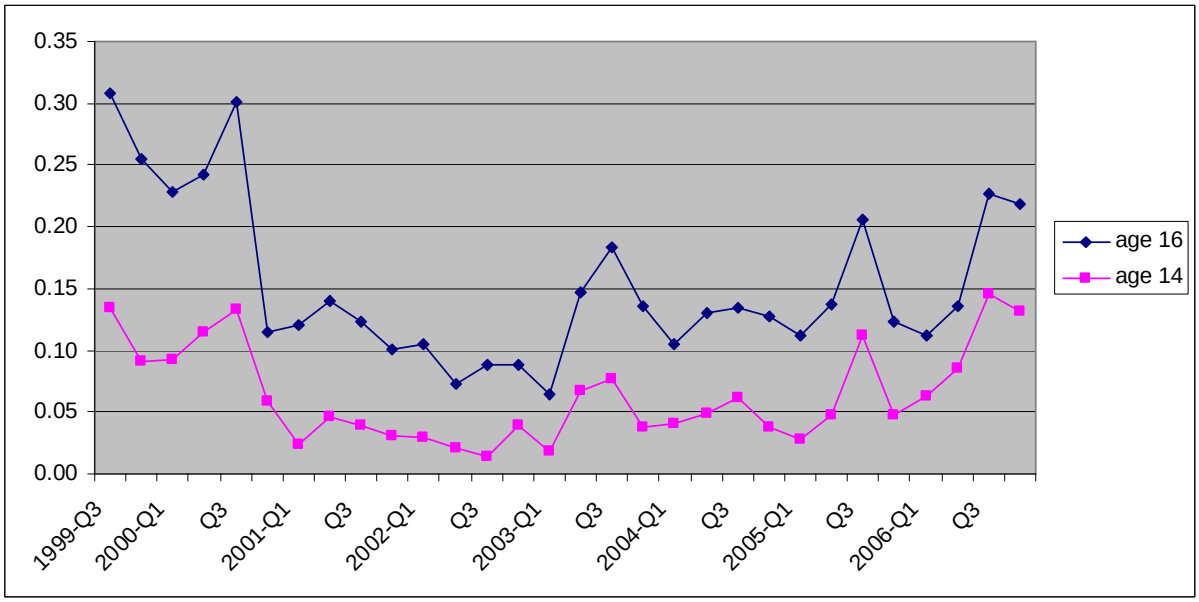
data must be kept in mind, we believe that data provides valuable evidence that would otherwise never be available about short-run household dynamics during a period of intensified conflict in Palestine.

Our sample includes 10-16 years old boys and head of their households[3]. We use data from the West Bank, excluding the Gaza Strip, since these two territories of Palestine are geographically separate and their economic and political context often differ considerably. We also exclude girls from our analysis since there are very few child labour among them.

Trends in youth employment in Palestine

The LFS data provide a detailed picture of trends in youth employment for the period 1999-2006. Figure 1 shows employment rates for 14-year-old and 16-year-old boys of Palestine in LFS from third quarter of 1999 to fourth quarter of 2006. The 14-year-olds are particularly interesting, since they are the oldest age group still considered to children under most international definitions. The figure shows that the employment rates of 14-year-old in Palestine have declined since 1999. However, there is an indication of increase in recent years. The trend of the employment rates for 16-year-old boys is quite similar, though relatively higher throughout the period.

Figure 1: Proportion of 14 years old and 16 years old males working, 1999-2006, West Bank, Palestine.



[3] Though we use the term 'household head', in all cases household head is male and father of the child.

The longitudinal dimension of the LFS makes it possible to estimate quarter-to-quarter labour force transition. Figure 2 shows quarterly employment transition of 14-year-old and 16-year-old boys for the period 1999-2006. The exit rate for quarter t is the number of children who moved from the category "working in quarter t" to "not working in quarter $t+1$" divided by the number who were working in quarter t. The entry rate is defined analogously using the number who moved from "not working in quarter t" to "working in quarter $t+1$".

Figure 2: Rates of entry into and exit from employment, 14 and 16 years old boys, West Bank, Palestine.

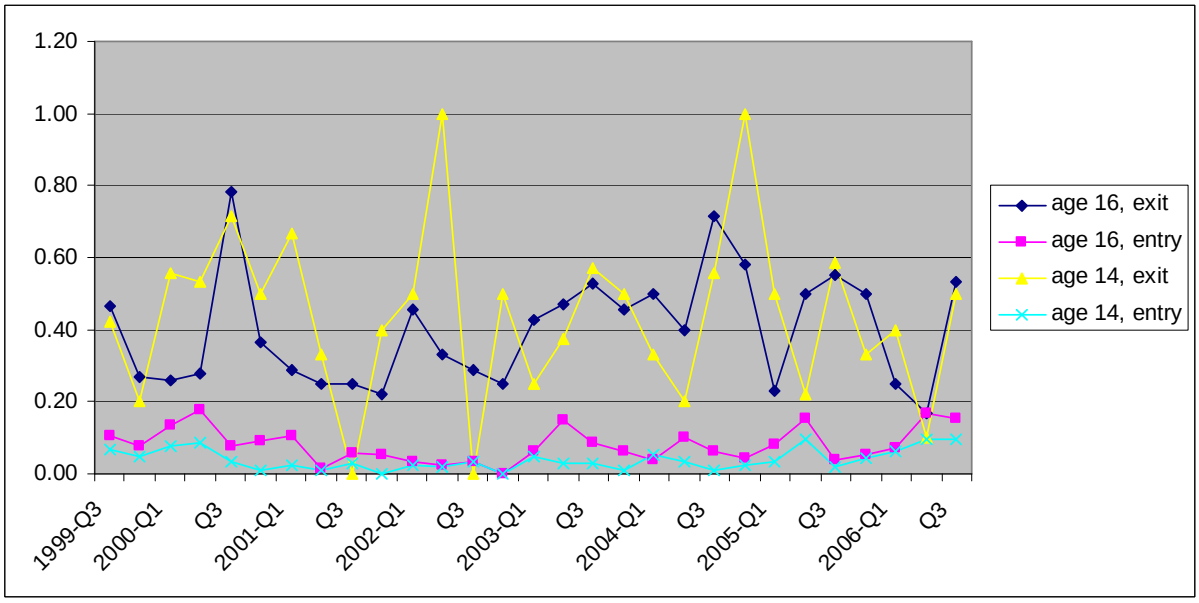


Figure 2 shows that the probability that a child (14/16-year-old) who is working in a quarter is observed not working in next quarter is around 40%. The exit rates for 14-year-old boys show higher volatility than that of 16-year-old boys. The probability that a 14-year-old boy who is not working in a quarter begins working in next quarter is around 4%, with a little higher estimates for 16-year-old boys. The lower entry rates, compared to exit rates, for both age groups account for the decline in child labour during the period 1999-2006.

Table 1 shows means of child labour, schooling and other outcomes by year from 1999 to 2006. The table shows 2% point decrease in child labour over the period. The average years of schooling has remained almost the same, with a little decline since 2000.

Table 1: Sample means for selected variables by year for children, age 10-16, Palestinian Labour Force Survey 1999-2006.

Year	Values for child and household head in Quarter 1				Outcomes conditional on state in Quarter 1	
	Child working	Child's years of schooling	Household head works in Israel	Household head's schooling	Child starts working in Quarter 2	Household head looses job in Israel in Quarter 2
	(1)	(2)	(3)	(4)	(5)	(6)
1999	6.99	6.48	23.62	8.72	4.06	18.87
2000	5.31	5.99	25.13	8.72	3.95	21.11
2001	2.51	5.94	17.90	8.99	2.01	50.80
2002	1.86	6.05	6.87	9.11	2.86	39.48
2003	3.35	6.14	9.88	9.19	2.81	29.66
2004	2.61	6.13	10.92	9.28	2.13	33.39
2005	3.39	6.29	9.50	9.54	3.37	30.89
2006	4.82	6.33	8.73	9.54	6.10	34.12
Total	3.94	6.17	14.38	9.12	3.31	29.82
N	45,445	45,445	45,353	45,353	36,163	5,603

Note: Means are estimated for the largest possible sample for each outcome in each year. Column 5 is conditional on child not working in Quarter 1. Column 6 is conditional on household head working in Israel in Quarter 1.

The percentage of household heads working in Israel is 14%. However, going down the column 3 reveals that the percentage has declined from 23% in 1999 to 9% in 2006. Column 4 shows the average years of schooling of household heads; it has increased over the period almost by a year. The last two columns show the means for the key transitions that are the focus of our analysis. Column 5 shows the probability that a child who is not working in quarter 1 begins working in quarter 2. The probability is 4% in 1999 and 6% in 2006, with lower probability estimates for interim years. Interestingly, the pattern seems to follow a U-shape which mimics the dynamics of child labour reported in column 1.

The last column (Column 6) reports the main variable of our analysis: the percentage of household heads who were working in Israel in quarter 1 looses the job in quarter 2. As the column shows, the probability of household head's job loss in Israel has markedly increased between 1999 and 2001 – from 19% to 51%, and since then has maintained an average well above 30%. The average probability during the whole period is 30%.

4. Estimation and results:

The panel structure of the Palestinian LFS allows us to follow household head and the children living with them over two consecutive quarters in which they are interviewed. The sample used for the regression consists of male children aged 10-16 who are not working at the time of the first interview. We focus on the timing of household head's job loss in Israel. An important issue in looking at the effect of household heads job loss is that the observation of household head's employment shock may simply be a proxy for household characteristics that are correlated with child labour. Our panel data makes it possible to separate the effect of

household head's job loss in Israel that occurs in the same quarter from job loss that occurs in later quarters. This allows us to control for household heterogeneity that may cause spurious correlation between household head's job loss in Israel and child labour in Palestine.

Let us define the dependent variable representing child labour by L taking value 1 if the child who was not working in quarter 1 is working in quarter 2. If the child is not working in both the quarters, then $L = 0$. Following Duryea et al. (2007), we use a latent variable specification for observed child outcome.

$$L_i^* = X_i^{'}\theta + Y_i^{'p}\beta + JL_i\lambda + year_i + district_i + v_i$$

where L^* is the latent variable, X is the vector of household and child characteristics, Y^p is a vector of permanent income variables for the household, and JL is a dummy variable for household head's job loss in Israel. Year and district dummies are included to control for time varying macro-economic factors and district level heterogeneity, respectively. The error term v_i is assumed to be zero-mean normally distributed. The child is observed working if $L^* \geq 0$,

$$L_i = 1 \text{ if } -(X_i^{'}\theta + Y_i^{'p}\beta + JL_i\lambda + year_i + district_i) \leq v_i$$

We estimate a probit version of this equation. If household head's job loss in Israel affects child labour we would expect a positive value for λ.

There can be two explanations for finding that household head's job loss in Israel affects child labour. First, household head's job loss is unanticipated, and affects children's work. Second, there are some permanent characteristics of the household related to job loss that affect children's work transition. In other word, it is possible that household head's job loss is positively associated with child labour because of some persistent unobserved heterogeneity that drives both the outcomes. For example, fathers with low ability and often labour force changes may have children with frequent employment transition, even though there is not a direct causal relationship between father's employment shock and children's work transition.

We test the causality by using information about the ex-post job loss of household head. If there is no causal relation, then ex-post job loss could affect child labour. Since we observe father's job loss even after two quarters after a child has started working, we test directly whether there is causal relation between father's job loss in Israel and child labour. As we will see later, the estimation results provide evidence for a causal relationship. Since we do not expect job loss in Israel to be entirely unanticipated, and since the precise timing of transition may not show up perfectly in our data, we do not require strictly that household head's job loss in Israel occurs before the child begins work. If the household head who was working in Israel in quarter 1 looses his job in quarter 2, and his child who was not working in quarter 1

starts working in quarter 2, we interpret the head's job loss causing the child's work transition. On the other hand, we let the data tell us whether job loss that occurs after quarter 2 has an impact on child labour in quarter 2.

In our first set of regressions the household head's job loss variables are constructed with the aim of comparing the impact of job loss occurring in the same quarter with the impact of job loss occurring in 2 quarters later. This provides evidence about whether children's work is a response to household head's job loss in Israel rather than the result of persistent unobserved heterogeneity. Our control group is household heads who are working in Israel in quarters 1, 2 and 3[4]. Our treatment group is household head who are working in Israel in quarter 1 but not working in Israel in quarter 2. If the child was not working in 2nd quarter of 2001 and the father who was working in Israel in that quarter is not working in Israel in 3rd quarter of 2001, we examine whether the child begins work in 3rd quarter of 2001. As a robustness check we also consider the case of ex-post job loss occurring two quarters later i.e. in 2nd quarter of 2002. Since household head looses job after 3rd quarter of 2001, it should not have any effect on whether the child begins working in 3rd quarter of 2001 as long as the household head's job loss is unrelated to persistent heterogeneity with respect to characteristics that drive child labour.

After analysing the issue of ex-ante versus ex-post job loss in Regression 1, in Regression 2 we include only job loss in 2nd quarter and use this estimation sample for further analysis. The case of ex-post job loss is dropped from the sample to simplify the job loss versus non-job loss comparison.

In short, the sample is restricted to 10-16 years old boys who are not working in the first interviews (Quarter 1). The household head who is father must work in Israel in the first interview (Quarter 1). All other children are excluded from the sample. We also control for the sex, age and years of schooling of the child. To control for household's permanent income we include age and years of schooling of parents. To control for local conditions, we use district dummies, with Ramallah as the omitted district. We use dummies for year pairs to capture time trends.

Descriptive statistics for the variables in two samples are given in Table 2. The number of observations[5] for the sample for Regression 1 is 3,501 and for Regression 2 is 5,383. The

[4] It should be noted that between 2nd and 3rd interviews in LFS, a household is rotated out for 2 quarters. Hence the quarter 3 here is actually 2 quarters after 2nd interview.

[5] The actual numbers of observations are three and two times the numbers reported for regression 1 and regression 2, respectively, since the regression 1 uses data from 3 quarters for each child and regression 2 uses data from 2 quarter for each child.

child labour for 1st sample is 3% and for 2nd sample 4%. Other variables are almost identically distributed in these two samples. It is important to note that mean years of schooling of children is similar to that for a much larger sample reported in Table 1, though father's education is slightly lower for the estimation samples. Mean years of schooling of mother is around 7 years in both estimation samples. We have considerable geographical variation within both West Bank and Gaza Strip of Palestinian territories. It is important to note that in addition to usual urban-rural dichotomy, we have an addition group called 'camp" in the variable for locality type. It shows that almost 15% of the households in Palestine live in camps.

Table 2: Descriptive statistics of the samples used for estimation, male children, age 10-16, Palestine.

Variable	Sample for regression 1		Sample for regression 2	
	Mean	Std. Deviation	Mean	Std. Deviation
Dependent variable				
Child begins working in Quarter 2	0.028	0.166	0.040	0.197
Household head's job loss in Israel				
Looses job in Quarter 2	0.308	0.462	0.297	0.457
Looses job in Quarter 3	0.458	0.498		
Age of child	12.115	1.699	12.251	1.949
Years of schooling of child	5.862	1.804	5.944	2.000
Age of father	41.425	6.224	41.561	6.349
Years of schooling of father	8.282	3.257	8.268	3.258
Age of mother	37.865	6.130	37.911	6.166
Years of schooling of mother	7.460	3.715	7.419	3.748
District				
Jenin	0.053	0.224	0.061	0.239
Tubas	0.022	0.148	0.025	0.158
Tulkarm	0.029	0.167	0.028	0.166
Nablus	0.038	0.191	0.042	0.200
Qalqilya	0.037	0.190	0.045	0.207
Salfit	0.044	0.205	0.048	0.214
Ramallah	0.050	0.217	0.049	0.216
Jericho	0.015	0.122	0.015	0.123
Jerusalem	0.107	0.309	0.106	0.307
Bethlehem	0.092	0.289	0.087	0.282
Herbon	0.212	0.409	0.203	0.402
North Gaza	0.076	0.265	0.078	0.269
Gaza City	0.066	0.249	0.061	0.240
Deer Al-Balah	0.046	0.209	0.043	0.204
Khan Younis	0.058	0.234	0.054	0.227
Rafah	0.055	0.228	0.053	0.225
Urban	0.380	0.486	0.373	0.484
Rural	0.475	0.499	0.481	0.500
Camp	0.145	0.352	0.146	0.353
Number of observations	3501		5383	

Note: Both samples are conditional on child not working in Quarter 1 and household head working in Israel in Quarter 1.

Table 3 presents our estimation results. Looking at the coefficients of main variables – job loss in Israel – we see that such a shock to household head in quarter 2 has a statistically significant positive effect on the probability that child begins working in quarter 2. This might indicate that if the household is credit constrained, household uses child's work as a way to buffer transitory income shock. The coefficient for the variable indicating ex-post shock (that is, job loss in Israel after 2 quarters) is not statistically significant, with the point estimate that

is much smaller that for the ex-ante shock. This is strong evidence that the apparent effect of ex-ante job loss is not simply due to a correlation between household head's job loss and unobserved household characteristics that cause both job loss for head and child labour. It also suggests that job losses occurring after 2 quarters in future are not fully anticipated. Results from regression 2 provide further evidence that the effect job loss in Israel is relatively large, as discussed below.

Now turning to other variables we find that permanent income variables of households are not significant predictor of children's work transition. Father's age appear to be significant, but only in Regression 1. However, there are indications of spatial and over time variation in child labour transition. Children in Ramallah are consistently more like to be child labour than those in Tubas, Bethlehem and North Gaza. In year 2001 children were less likely to be child labour than in year 1999. This might be due to the fact that after the 2nd Intifada of September 2000, the sudden increase in unemployment rate in Palestine crowded out child labour.

In terms of predicted probabilities, we find a large effect of father's job loss in Israel on the probability that a child begins working. Using the estimates from regression 2, we calculate that father's job loss in Israel increase the probability of child labour for a 16-year-old boy by 64%, and for a 14-year-old boy by 51%. Such large effects are also found for unemployment shock for Brazil in Duryea et al (2007). However, our results are particularly in a different context. The Palestinians who work in Israel fetch an average wage which is twice the average wage of the Palestinians working in Palestine. Arguably the shock we consider here is not concentrated among economically worse off households. For the same reason, it is also the case that the magnitude of the shock is considerably large. We speculate that the large effect of job loss is partially accounted by the magnitude of the shock.

Table 3: Probit regression – impact of job loss in Israel on child labour in Palestine.

Variable	Regression 1			Regression 2		
	Estimate		Std. Error	Estimate		Std. Error
Household head's job loss in Israel						
Looses job in Quarter 2	0.289	**	0.121	0.225	***	0.081
Looses job in Quarter 3	-0.076		0.121			
Child's age (age 10 omitted)						
Age 11	0.590	***	0.224	0.355	**	0.164
Age 12	1.072	***	0.232	0.761	***	0.168
Age 13	1.679	***	0.241	1.466	***	0.161
Age 14	2.402	***	0.258	2.042	***	0.170
Age 15	3.007	***	0.284	2.514	***	0.186
Age 16	3.976	***	0.683	3.238	***	0.209
Child's schooling	-0.443	***	0.041	-0.370	***	0.027
Father's age	0.228	**	0.113	0.118		0.075
Father's age squared/100	-0.236	*	0.126	-0.112		0.083
Father's schooling	0.012		0.062	0.073		0.046
Father's schooling squared/100	-0.167		0.385	-0.604	*	0.285
Mother's age	-0.054		0.100	0.032		0.073
Mother's age squared/100	0.039		0.125	-0.081		0.091
Mother's schooling	0.009		0.047	-0.041		0.031
Mother's schooling squared/100	-0.223		0.362	0.167		0.230
District (Ramallah omitted)						
Jenin	-0.342		0.298	-0.234		0.214
Tubas	0.684	**	0.288	0.441	**	0.223
Tulkarm	-0.175		0.332	0.041		0.240
Nablus	0.056		0.284	0.265		0.201
Qalqilya	-0.303		0.337	0.140		0.203
Salfit	-0.087		0.294	-0.049		0.215
Jericho	0.260		0.402	0.273		0.288
Jerusalem	-0.465	*	0.275	-0.310		0.199
Bethlehem	-0.747	**	0.326	-0.419	**	0.209
Herbon	-0.016		0.221	-0.057		0.169
North Gaza	-1.018	**	0.416	-0.591	**	0.243
Gaza City	-0.433		0.313	-0.112		0.221
Deer Al-Balah	-0.645	*	0.374	-0.466		0.288
Khan Younis	-0.375		0.314	-0.436	*	0.256
Rafah	-0.377		0.304	-0.433	*	0.257
Rural	-0.037		0.127	0.076		0.092
Camp	0.129		0.189	-0.116		0.143
Year of first interview (1999 omitted)						
Year 2000	-0.066		0.155	-0.084		0.108
Year 2001	-0.447	**	0.195	-0.363	***	0.138
Year 2002	-0.476	*	0.268	-0.479	**	0.216
Year 2003	-0.348		0.232	-0.074		0.156
Year 2004	-0.178		0.198	-0.154		0.151
Year 2005	-0.025		0.203	0.031		0.148
Year 2006				0.251		0.147
Constant	-4.231	*	2.225	-3.729	**	1.560
Log likelihood	-329.596			-672.0727		
Number of observations	3,501			5,383		

Note: *, ** and *** stand for significant at 10%, 5% and 1%, respectively.

In further regressions (not presented here) we divide the job loss in to detailed labour market transitions and estimate their effect on child labour transition. The shock in quarter 2 is further divided into three groups: (i) job loss in Israel and wage employment in Palestine, (ii) job loss in Israel and unemployment, and (ii) job loss in Israel and self-employment in Palestine. The distribution of these groups among 29.7% household heads loosing job in Israel is the following. After job loss in Israel 7.77% take up wage employment in Palestine (majority being in informal sector), 10.8% start own business (self-employment) in Palestine, and 11.13% remain unemployed. The estimation with these transition variables reveal that job loss in Israel and self-employment in Palestine has the higher effect on child labour transition, followed wage employment in Palestine after job loss in Israel. The effect of job loss in Israel and unemployment afterward is not significant. This finding is consistent with the recent literature on child labour that shows ownership of productive assets by household increases child labour. However, our finding adds another dimension to this argument. In line with other studies we find that economic shock forces household to supply child labour in order to smooth consumption. But the shock has the highest effect when the household facing the shock is forced to move to a residual sector (self-employment) that provides opportunity for the utilization of their children's time.

We use job loss in Israel as our measure of economic shock. The alternative would be to use household income change. However, we refrain from using household income since the number of missing is very high in our data, and the potential misreporting of income data might obscure the effect of economic shock. However, we perform a robustness check using a relevant sub-sample of observations. Since the Israel-Palestine conflict took an unprecedented intensity after the 2nd Intifada of September 2000, it is reasonable to assume that job losses after this point in time are primarily caused by the conflict. We use a sub-sample that incorporates data from the last quarter of 2000 to the last quarter of 2006. Using this sample for Regression 1 and Regression 2 provides similar results. The job loss of father in Israel in quarter 2 has a significant positive effect on the probability that his son begins working in quarter 2. Using further transition of father's labour market status after job loss in Israel, we find that child labour is caused by the episode when father's job loss in Israel is followed by his self-employment in Palestine.

5. Conclusions

In this paper we study the effect of economic shock on child labour in Palestine. We focus on the job loss of household head in Israel since the exogenous nature of shock allows us to

derive causal interpretation. Further we use longitudinal employment data in order to focus on the timing of the shock and child labour transition.

Our results provide evidence of a significant positive effect of job loss in Israel on child labour in Palestine. It indicates that in absence of credit market the economic shock forces the households to allocate children's time in a way to smooth consumption. The shock we consider is suffered by arguably better-off households. However, the magnitude of the shock is also likely to large. Our findings suggest that negative effect of economic shock on child labour is not confined among poor households, as is often portrayed in literature.

As for the effect, we find the father's job loss in Israel increase the probability that his 16-year-old child begins working by 64%. The increase in probability for a 14-year-old boy is 51%. We also find evidence that transition to child labour is caused when shock driven household head starts own business, arguably creating opportunity for the employment of his own child.

Appendix A

This appendix provides an analysis of sample attrition. Like most national employment survey with rotating panel design, the Palestinian Labour Force Survey is designed to reduce volatility in estimates of quarter to quarter changes in unemployment. It is not designed explicitly to analyse longitudinal transition of individuals. Households in the survey can be linked across quarter by using the unique household identification number. Household members are linked across quarters by using the household identification number and the unique person identification number within a household. As shown below (Table A1), sample attrition is relatively high in the Palestinian Labour Force Survey over the 5-quarter period that is used in our analysis. Since linking male children and their fathers across quarters is critical for our analysis, we analyse the magnitude and selectivity of sample attrition with respect to their characteristics.

Table A1: Measures of sample attrition and selectivity bias, male children aged 10-16 years, Palestinian Labour Force Survey, 1999-2006.

Sample	Number of observations	Percentage of sample A	Mean children's schooling in quarter 1	Percentage children working in quarter 1	Mean father's schooling in quarter 1	Percentage father working in Israel in quarter 1
A. Male child present in quarter 1	45,428	100.00	6.17	3.94		
B. Male child and father present in quarter 1	43,387	95.51	6.16	3.91	9.25	14.99
C. Male child present in quarters 1 and 2	38,171	84.03	6.14	3.48		
D. Male child and father present in quarters 1 and 2	36,525	80.40	6.13	3.47	9.23	15.30
E. Male child present in quarters 1, 2 and 3	24,624	54.20	6.04	2.70		
F. Male child and father present in quarters 1, 2 and 3	23,582	51.91	6.04	2.68	9.23	15.25

Table A1 presents summary statistics for male children aged 10-16 years using alternative sample restrictions. Sample A consists of all 10-16 year-old boys who are even observed in a quarter corresponding to the first quarter a household enters the Labour Force Survey. We observe 45,428 such boys in the period 1999-2006. Sample B adds the restriction that the father is present in the household, a restriction required for our analysis of the impact of father's job loss in Israel. The table shows that 95.5% boys are in household where father is the household head. Sample C adds the restriction that the child is observed for two consecutive quarters. This restriction reduced the sample to 84% of Sample A. Sample D adds the restriction that both the child and his father are observed for two consecutive quarters. The sample reduces to 80% of Sample A. Sample E consists of boys who are observed for three quarters (two consecutive quarters and then a quarter after a gap of two quarters). And Sample F consists of boys who along with fathers are observed for three quarters. The sample reduces to 54% and 52% of Sample A with these last two restrictions. The sharp reduction can be attributed to the fact the gap between the first interview and the third interview is actually a year.

As shown in Table A1, 48% of our initial sample disappears before there are interviewed for the third time. While it is difficult to ascertain whether households that disappear from the sample were more likely to have unemployment shock in Israel, we can analyse attrition with respect to characteristics observed in first quarter. In other words, we can analyse the extend to which sample attrition is non-random using first quarter variables that are relevant for our analysis – child's schooling, child's employment, father's schooling and father's employment in Israel. The mean values of these variables show very little difference across sub-samples except for child's employment. In spite of relative high attrition, child's schooling, father's schooling and father's employment in Israel are comparable across samples. However, the percentage of child working in the first quarter decreases by more than 1 percentage point as

the sample of all boys is restricted include to boys who along with their fathers are observed three times in the survey. This reduction of child labour in longer panels are caused by the restrictions of age (10-16 years) used for our analysis. Child labour is more among 16 years-old boys than younger ones. Boys those who are 16 year-old in first quarter have a higher probability of being above the 16 years threshold in consecutive quarters. They are particularly more likely to be more than 16 years in their third interview which is exactly one year after the first interview. Hence the reduction in child employment in longer panels is caused by the sample restriction used for analysis rather than by non-random sample attrition. From this descriptive analysis of different samples we conclude that the restricted samples are quite similar to the sample of boys ever observed in the survey.

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