

# **How children's schooling and work are affected when their father leaves the household and can conditional cash transfers compensate?**

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## **Abstract**

This paper investigates how the departure of the father from the household, that results in his permanent absence, affects children's school enrolment and work participation in rural Colombia. Our results show that departure of the father decreases children's school enrolment by around 4 percentage points, and increases child labour by 3 percentage points. After using household fixed effects to deal with time-invariant unobserved heterogeneity, and providing evidence suggesting that estimates are not biased by time varying unobserved heterogeneity, we also exploit the roll-out of a conditional cash transfer program during our period of study, and show that it counteracts these adverse effects. This, and other pieces of evidence we give, strongly suggests that the channel through which the father's departure affects children is through reducing income. It also highlights the important safety net role played by such welfare programs, in particular for very disadvantaged households, who are unlikely to find formal or informal ways of insuring themselves against such vagaries.

**Keywords:** Child labour; Schooling; Permanent departure; Income loss; Credit and insurance market failures; Conditional cash transfer; Safety net.

**JEL classification:** I20, J12, J22, O16

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# 1 Introduction

A major disruption to family life can have serious consequences for children. A particularly traumatic event is the departure of the father from the household on a permanent basis. There are at least three different channels through which this can affect children's human capital accumulation, and in particular their school and work participation (more discussion of the following points is to be found in Case et al, 2004 and Gertler et al, 2004). First, it is likely to involve a substantial income loss and this may be important for school choices in the presence of credit and insurance market failures. Second, the balance of decision-making power within the household may change, with the preferences of remaining adults gaining increased importance, which may have important consequences for children. Third, the loss of a parent can have significant emotional and psychological consequences for children. The importance of the first and third channels was highlighted in a World Bank Development Outreach report (Bell et al, 2006).

*'if parents sicken and die while their children are still young, then all the means needed to raise the children so that they can become productive and capable citizens will be greatly reduced. The affected families' lifetime income will shrink, and hence also the means to finance the children's education, whether in the form of school fees or taxes. On a parent's death, moreover, the children will lose the love, knowledge and guidance which complement formal education.'*

Some countries, particularly in Africa, have put in place policies to provide education and health support to children who have lost one or both parents. These policies appear to be a response to the increase in HIV-associated mortality, which has

resulted in millions of children losing parents to AIDS. Yet the absence of the father from the household whilst a child is still young is a pervasive phenomenon. Despite this, there is surprisingly little evidence on how children are affected by the long-term departure of one or more parents (exceptions are referred to below) and on how policies may protect them against such adversities. In this paper, we first investigate how the departure of the father from the household - that results in his *permanent* absence - affects children's school enrolment and work participation.<sup>1</sup> We then examine the extent to which a conditional cash transfer program mitigates the adverse effects we find. We are interested in the effects on children's school and work participation because of their importance for human capital accumulation; moreover child work also affects family income and current poverty, which is indeed the reason why we may expect it to increase to compensate for income reductions.

Departure of the father is a relatively rare occurrence amongst our households. In order to focus on more permanent reductions in income, which are more difficult to insure against than transitory ones, we consider only departures due to death and divorce, which we can be confident are permanent. A central concern is that divorce or widowhood are not exogenous with respect to other determinants of child outcomes (see van de Walle, 2011, for related selection issues). Previous work has attempted to exploit exogenous variation to overcome this problem, for instance in divorce laws (Gruber, 2004) and child sex composition (Dahl and Moretti, 2008). In this paper, we provide several pieces of evidence which, taken together, build confidence in the quasi-random nature of the departure of the father. First, we show that observable characteristics (*before* the departure happened) of households in which the father did

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<sup>1</sup> Note that departure of mother is also an important issue and may have different effects compared to those stressed in this paper. However, we have insufficient variation in the data to allow us to look at this.

and did not subsequently depart are quite similar. Although reassuring, the concern remains that unobserved heterogeneity may differ between these two types of households. We deal with time-invariant unobserved heterogeneity by allowing for household fixed effects in a three year panel of households. So, in line with related literature (for instance De Janvry et al, 2006), our empirical method assumes common trends across both types of household. Note that this is conditional on a set of covariates, including transitory income shocks, making it more credible. We assess the plausibility of this common trends assumption by looking at pre-departure trends in children's schooling and per capita income, across households where the father does and does not subsequently depart, and are reassured by the fact that they do not differ significantly. To deal with endogeneity concerns due to potential correlation with time varying shocks, we check whether divorce is correlated with recent significant time-varying shocks including crop losses, business losses and illnesses, and find that it is not. Finally, to further build confidence in the quasi-random nature of the departure we carry out a falsification exercise by checking whether current child activities are correlated with future departure of the head: the idea here is that *future* departure should not lead to a significant effect on *current* activities if departure is effectively quasi-random. We find, reassuringly, no evidence that it does.

Our main finding is that the father's permanent absence from the household affects adversely the schooling of both boys and girls, and it increases their participation in paid and unpaid work. These findings are particularly pronounced for the relatively less well-off, who are likely to face the more severe liquidity constraints, and is consistent with the father's absence affecting activities through the income reduction associated with it. A second key finding of the paper is that the conditional cash

transfer program *Familias en Acción* helps protect children against the vagaries of the event: it protects their schooling and offsets the increased child labour after the father's departure. The fact that the CCT program acts as a safety net suggests that the main impact of father's departure is through the income loss associated with it.

Our work fits into a number of strands of literature. First, it is related to the growing literature in developing countries on parental deaths and children's education. This literature investigates the importance of different channels in explaining the observed impacts (Beegle et al, 2006b, Case et al, 2004; Gertler et al, 2004; Yamano and Jayne, 2005; Evans and Miguel, 2007; van de Walle, 2011). It generally finds adverse effects on schooling, particularly on primary school participation. This literature generally does not consider the effects on child labour however, clearly an important economic activity amongst children in developing countries and one which may be particularly responsive to an event that induces a substantial income reduction. We consider permanent departure of the father through either death or divorce, which are the two events in our data resulting in substantial income reductions for households. Whilst the channels through which both may affect outcomes may differ<sup>2</sup>, our empirical work suggests that it is the income reduction entailed that is the main driver of observed effects.

Our work also fits into the strand of the literature that considers the relationship between children's work participation and other negative income shocks, such as labour market shocks (Parker and Skoufias, 2006), and/or crop losses (Jacoby and

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<sup>2</sup> An absent but living father can visit and influence the children's upbringing in a way that a deceased father cannot. On the other hand, relations with the absent parent's family might also be very different in the two cases, perhaps, more supportive in cases of early death of the father than in cases of acrimonious separation. Moreover transfers from the father or in-laws may compensate in different ways depending on the cause of departures. Our data do not permit an investigation of these channels.

Skoufias, 1997; Beegle et al, 2006a; Dehejia and Gatti, 2005; Duryea et al, 2007; Dammert, 2007; Guarcello et al 2003; Gubert and Robillard, 2008). In line with this literature, our results are consistent with the presence of credit and insurance market failures in rural Colombia. The paper is also related to the literature on the effects of migration of a parent on children left behind. Counteracting the positive effects that remittances sent from abroad may have on relaxing liquidity constraints, researchers have investigated the negative effects on schooling outcomes associated with parental absence from the home, and in particular that from the father since men are the ones who migrate in most contexts (see Antman 2012 for a survey, Gianelli and Mangiavacchi, 2010, Lahaie et al., 2009).

The second part of the paper, which provides evidence of CCT programs attenuating the negative income effects entailed by permanent absence of the father on children's activities, fits into a growing literature on the role of CCTs as a safety net. Indeed, CCT programs are a fast growing part of safety net policy, and there is evidence that they provide households with protection against short-term shocks, both systemic and idiosyncratic. For instance, De Janvry et al (2006) show that the Mexican PROGRESA program fully protected children's schooling from shocks due to unemployment and illness of the household head, as well as natural disasters in the community. Maluccio (2005) shows that the Nicaragua Red de Protección Social protected household's total and food expenses and children's school attendance against the effect of the Central America coffee crisis in 2000-2001. More recently, Gitter et al (2011) provide evidence of CCT programs mitigating the effects of negative shocks on physical development in early childhood. Our results are very much in line with these papers, suggesting that CCT programs provide a safety net

against income losses. A distinctive feature of our work is that we consider income losses that are likely to be permanent and that are thus even more difficult to insure against than transitory reductions to income.

The remainder of the paper is structured as follows. In section 2 we describe the data that we use in this research. We discuss identification issues in section 3 and present the empirical methodology and main results in section 4. Section 5 considers whether the CCT program introduced in the environment we consider has cushioned the poor households in our sample against these effects and section 6 concludes.

## **2 Data**

### **2.1 Background**

We use three years of panel data from a survey of households and individuals in rural Colombia. These data have been collected to evaluate the large scale welfare program *Familias en Acción*, which has been in place in rural areas of Colombia since 2002, and which has since expanded to cover urban areas. The program aims at alleviating poverty by fostering human capital accumulation among the poorest households through conditional subsidies for investments into education, nutrition and health.

The first wave of data collection for the evaluation of the program took place in 2002, when around 11,500 households were interviewed. We refer to this as the baseline survey. A year later, after the program started, a second wave of data was collected, and a third wave was collected in 2006. We refer to these as the first and second follow-up surveys respectively. In this paper we estimate the effects of the father's

permanent absence on children's outcomes.<sup>3</sup> The socio-economic data are rich, reflecting face-to-face interviews that lasted on average 3.5 hours.

## **2.2 Descriptive statistics**

We follow the school and work status of the children in households with at least one child aged 7-14 at the first survey across surveys 2 (1 year later) and 3 (3.5 years later), up until they are at most 17 years of age. As we are considering the effects of departure of the father since baseline, we restrict the sample to households in which both parents are present at baseline.<sup>4</sup>

### **2.2.1 Outcomes**

We consider two outcomes - school enrolment, which relates to whether the individual is enrolled in school at the time of the survey and work participation, which includes all types of paid and unpaid economic activities, as well as looking for work as a main activity.<sup>5</sup> Table 1 shows the proportions of our sample enrolled in school and participating in work, by age and gender. We see that school participation rates are high amongst children aged 7-11, corresponding to primary school.<sup>6</sup> The first substantial drop in school enrolment is observed at age 12, at the transition from primary to secondary school. Another point worth noting is that school enrolment of females is higher than that of males. Engagement in work is around twice higher for

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<sup>3</sup> We start with a sample of households where both parents are married so, by definition, fathers are all present at baseline.

<sup>4</sup> This sample selection criterion means that we retain 9,287 out of 12,652 households with a 7-14 year old at the first survey. The reason why we do not keep mono-parental households is because the departure of the father (if present) in such households would raise additional issues, which would be difficult to disentangle.

<sup>5</sup> School enrolment is defined on the basis of whether the child is registered at school in the academic year corresponding to the survey.

<sup>6</sup> The school system in Colombia operates as follows. Compulsory education is free and lasts for nine years, and consists of basic primary (five years, ages 7 through 11) and basic secondary (educación básica secundaria, four years, ages 12 through 15). The secondary school system also includes the middle secondary cycle (educación media, two years, ages 16 and 17). Successful completion of studies leads to the Bachillerato. Students must pass an entrance examination for access to universities.



males than for females, and is very low for both, below 6%, before the age of 12 (participation in work is not recorded for individuals below age 10).

[TABLE 1 HERE]

### **2.2.2 *Permanent absence of the father***

In order to capture a potentially very important disruption to family life and a long-term reduction in income, we focus on the departure of the child's father from the household since the baseline, and in particular one that results in his subsequent *permanent* absence from the household.<sup>7</sup> Divorce and death are the two reasons for permanent absences that are identifiable from the data. As they are relatively rare events, we pool them in order to improve statistical precision.<sup>8</sup> To measure the incidence of divorce, we combine information on marital status of the child's mother at times  $t-1$  and  $t$ , and the status of the father at time  $t$ . In particular, if her marital status at time  $t$  is divorced, at time  $t-1$  is married, and if father's status at time  $t$  is 'no longer in the household', we consider this to be a divorce. Deaths, on the other hand, are coded directly in the survey. Departure of the father due to death or divorce has occurred in 5.6% of our sample of households (i.e. those with at least one 7 to 14 year old at baseline). Divorce accounts for 82% of such departures and death for 18% of them.<sup>9</sup>

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<sup>7</sup> Note that absent fathers are not being 'replaced' in households, at least in the short term span of our analysis: whilst we see that the number of male adults is lower by almost 1 in households that experience departure, the number of female adults is the same (as is the number of children).

<sup>8</sup> We also checked that, considered separately, they do not have significantly different impacts (see Section 4).

<sup>9</sup> In an additional 1% of households, both the father and mother have left the household for an unknown, possibly temporary, reason; there is also a small percentage (1.2%) of households in which the father has left for an unknown reason, but the mother has remained in the household and reports being married, so we assume that these are temporary departures. These are not the main variables of interest but we control for them throughout the analysis.

The average age of fathers who leave the household is 43 at baseline, and it results in a substantial income reduction: 90% of these fathers were working at the baseline. To give some idea as to the extent of the income loss associated with the departure, we compare total household labour earnings across households with and without an absent father. Total labour earnings are around 20% lower, controlling for household composition (number of adults, separately by gender).<sup>10,11</sup> We also compare total household consumption, a more direct indicator of welfare of the poor households in our sample, and one for which we have very detailed data. It is lower by around 13% in households in which the father subsequently departed compared with households in which he did not (again controlling for number of adults, separately by gender). Both differences are significant at the 1% level.

Whether such events are fully anticipatable or not, it is unlikely that the households in our sample have ways to fully insure against the income losses they entail, in particular as they live in rural municipalities where credit and insurance markets are typically thin (Edmonds, 2006). In these conditions, we expect them to affect household decisions to send their children to school/work. In addition to this, paternal absence is likely to have a number of other important repercussions (see for example Gertler et al, 2004 for a discussion of these). First, the father is likely to be one of the key decision-makers in the household, so his departure may bring about changes in bargaining power and decision-making within the household, which may affect children's education and work. Second, the father can be an important figure head for

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<sup>10</sup> In an auxiliary regression we also controlled for a more refined child (age-gender) composition but it does not affect this difference, as one might expect if adults are the main breadwinners in the household.

<sup>11</sup> We see this as a lower bound of the magnitude of the departure effect in terms of total household adult earnings, as it includes labour supply responses to it, which are likely to cushion the potential adverse effects on income. This figure excludes earnings from children to mitigate this problem.

children. Though we cannot disentangle these channels with the available data we have, we note that the evidence we find is strongly consistent with income loss being the key factor affecting children's activities.

### 3 Identification

#### 3.1 Endogeneity

An important concern with paternal absence, and indeed one that has received much attention in the related literature (see for example Gruber, 2004), is that it may not be exogenous to the outcomes of interest, children's work and schooling. For instance, couples may split up due to having different preferences over investment in children, in which case we may be picking up the effects of preferences rather than divorce *per se*.<sup>12</sup> Whilst it is reassuring that pre-departure (i.e. baseline) observed characteristics of households that do and do not go on to experience departure of the father are quite similar as shown in Table 2 (differences are mainly in relation to education of the head), endogeneity concerns are clearly important to address.

[TABLE 2 HERE]

In the empirical work, we deal with these concerns in two ways. First, we control for time-invariant unobserved confounding factors through household fixed effects. Accordingly, our identification strategy relies on the assumption that the time trends are the same in households where the father does and does not depart, the plausibility of which we look at in detail below. Second, to address the concern that there may be

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<sup>12</sup> However if this were the case, then we would rather expect to see it having a *positive* impact on children, whereas we in fact observe the contrary. It must also be acknowledged that departure of the father due to death may not be a random event, though this is much less of a concern.

time-varying factors correlated with father's departure and child outcomes, we assess the relationship between divorce and observed time-varying shocks including crop losses, business losses and illnesses, and also control for such time varying shocks in the analysis to improve the conditional exogeneity of paternal departure.

To examine the plausibility of the common trends assumption, we look at trends in two key variables. First, we look at whether trends in children's schooling were the same in both types of household *before* the father departed. We have two periods of school enrolment data before the departure - at baseline (2002) and the year before (collected retrospectively at baseline). We see from the upper panel of Table 3 that we cannot reject that schooling trends are the same in both types of household, as shown by the insignificant coefficient on the interaction between the type of household ("departure") and the year dummy. As a second check for common trends, we compare trends in household per capita income in both types of household, before the father departed. We have three periods of income data before the departure, all collected retrospectively at baseline. The lower panel of Table 3 shows that the evolution of per capita household labour income in the years 1999, 2000 and 2001, is very similar across both types of household prior to the departure. This gives us no reason to believe they would not have been so if departure had not occurred.

[TABLE 3 HERE]

It is also worth noting that the sign of the estimates in Table 3 points, if anything, to a positive selection of the families with absent fathers in terms of schooling and income trends (although they are not significant). In this worst-case scenario, we would in fact underestimate the magnitude of the "true" impacts of departure: to pre-empt our main

results, the detrimental impacts of the permanent absence of the father on school enrolment and work would be even more pronounced than the ones we find.

As an additional exercise to build more confidence in the quasi-random nature of the absence of the father, we check whether current child activities are correlated with future absence of the father: *future* absence should not lead to a significant effect on *current* activities if departure is effectively random. To do this, we regress current children's activities (schooling/work at time  $t$ , for  $t=1,2$ ) on future absence (at time  $t+1$ ) and find, reassuringly, extremely small and insignificant correlations between them (0.009 for schooling, -0.009 for work, both with p-values of 0.5).

Whilst all of the evidence above is reassuring, it does not address concerns that there may be unobserved time-varying shocks affecting both the father's permanent departure and child outcomes. For instance, a temporary shock to income such as a crop/business loss or illness may affect the quality of the marital relationship and the likelihood of divorce, as well as affecting child outcomes. We can gauge the importance of this to some extent as households report the most important shocks in the year prior to the survey including crop loss, illness and business loss: when we check whether such shocks in period  $t-1$  are correlated with divorce in period  $t$ , we find that they are not (Table 4), which is reassuring. We also note that we control for these shocks in the empirical work and our point estimates on the main coefficient of interest are very similar with and without them.

Taken together, the above evidence builds confidence in the quasi-random nature of father's absence. We also reiterate that we control for time-invariant unobserved

household level characteristics and time varying observed ones (including, importantly, shocks) throughout all of the empirical analysis.

[TABLE 4 HERE]

### 3.2 Attrition

Overall, around 5% of households left between the baseline survey and the first follow up and an additional 8.5% of households left the sample between the first and second follow-ups (four years after baseline).<sup>13</sup> Although this attrition rate is relatively low<sup>14</sup>, it is a concern if the reason for leaving the sample is related to the behaviour being modelled, as might be the case if households from which the father departs are more likely to drop out of the sample. To address this, in Table 5 we compare baseline characteristics of households that did and did not subsequently leave the sample. As expected, households that own a house are significantly less likely to attrit compared to those that do not; and those living at relatively high altitudes are more likely to attrit. Other than that, attrition is not systematically related to any of the variables considered in the table. Whilst this is reassuring, potential selection biases on the basis of unobserved characteristics cannot be ruled out, which we account for in our empirical work. The methods we used to correct for this are discussed in Section 3 and all results presented take into account this possible selection problem, although it makes little difference to the effects we estimate.

[TABLE 5 HERE]

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<sup>13</sup> Attrition at the individual level is extremely rare, at less than 1%.

<sup>14</sup> It is comparable to the attrition rate of 6% between the baseline and follow-up surveys for the evaluation of the BDH in Ecuador, which is considered “low” and just under the attrition rate of 15% over four years in Nicaragua for the evaluation of the RPS, which is considered “reasonably low”. It is slightly higher than for the PROGRESA program, which was around 6% over the first three years of the program and considered to be very low (Fiszbein et al, 2009).

## 4 Effects of permanent absence of the father on schooling and work

### 4.1 Main Specification

To estimate the effects of the permanent absence of the father on children's school and work participation, we estimate the following model

$$y_{ijt} = \alpha_1 + \alpha_2 D_{jt} + X'_{ijt} \alpha_3 + I'_{jt-1} \alpha_4 + f_j + \delta_t + u_{ijt} \quad (1)$$

where  $i$  denotes child,  $j$  denotes household and  $t$  denotes time,  $t=1$  (baseline), 2 (first follow-up), 3 (second follow-up),  $y_{ijt}$  is a discrete indicator for participation in school or work,  $D_{jt}$  is an indicator that takes the value 1 if the father is absent from the household permanently, and 0 otherwise. Note that by definition,  $D_{j1} = 0$ .<sup>15</sup> If the father departed the household between baseline and first follow-up, then  $D_{j2} = 1$  and  $D_{j3} = 1$ ; if the father departed between first and second follow-ups then  $D_{j2} = 0$  and  $D_{j3} = 1$ .  $X_{ijt}$  is a vector of observed time-varying child and household characteristics including a cubic in the age of the child, number of siblings of different age categories (0-6, 7-12, 13-17, 18+),  $I_{jt-1}$  is a vector of time-varying shocks that occurred in the year prior to the survey, including dummies for crop losses, business losses and illnesses,  $f_j$  includes unobserved time-invariant household characteristics,  $\delta_t$  is a survey round dummy, and  $u_{ijt}$  is an error term that we assume to be *iid*. The coefficient of interest is  $\alpha_2$ , the effect of absence of the father on the outcome (school or work participation).

We estimate equation (1) using a linear probability model (LPM) and cluster the standard errors at the municipality level to adjust for potential correlations of household decisions within the same municipalities. Although the dependent variable

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<sup>15</sup> As discussed in section 2.2.2, our sample is restricted to households in which the father is present at baseline. We only observe departures *after* baseline.

is discrete, in our case the main advantage of the linear model over discrete choice models is that it is considerably easier to incorporate fixed effects. Another point to note is that in our application most of the explanatory variables are discrete and take on only a few values, strengthening the case for the LPM (Wooldridge, 2002, Chapter 15). Though a potential limitation of the LPM is that it can yield predicted probabilities outside the unit interval, in our case this is not a big concern as less than 3% of predictions lie outside the unit interval. Note also that we checked for robustness of our results to this linear specification, by estimating a fixed effects logit model (Honoré, 2002). The estimates, though less precisely estimated as they are based on the subset of children who changed their activity over time, point to the same patterns of coefficients as are discussed in the main text on the basis of LPMs and are shown in Table A2 in the Appendix.

As discussed in section 3.1, an important issue is that our variable of interest, father's permanent absence, may be correlated with unobserved household characteristics that have a direct effect on children's schooling and work. To net out the effects of unobserved characteristics that are fixed over time and may lead to spurious correlations between father's permanent absence and children's outcomes, we use a household fixed effects model. We also control for important time varying shocks to mitigate concerns that unobserved shocks are correlated with absence and the outcomes of interest.

A second issue, discussed in section 3.2, is that non-random attrition, if present, will yield inconsistent parameter estimates. We use a standard correction in a two-step



sample selection model (Heckman, 1979) and estimate the probability that the individual does not leave the survey, shown in equation (2), using a Probit model

$$\Pr(S_{ijt} = 1) = \beta_1 + \beta_2 Z_{jt-1} + X'_{ijt-1} \beta_3 + \beta_4 t + \eta_j + v_{ijt} \quad (2)$$

where  $S_{ijt}$  takes the value one if child  $i$  from household  $j$  does not leave the survey between wave  $t-1$  and wave  $t$ , and zero otherwise,  $Z_{jt-1}$  are the instruments used for identification, discussed below,  $X_{ijt-1}$  are individual and household characteristics at wave  $t-1$ ,  $t$  is a time dummy variable, and  $\eta_j$  is a household-level fixed effect, which may be correlated with  $f_j$  in equation (1).

The instrument set  $Z_{jt-1}$  includes characteristics of the previous interview - its date (day of the month) and whether the survey respondent was the household head or spouse. Both may affect the overall experience of the interview and thus willingness to be re-interviewed but are unlikely to affect the outcomes of interest since they relate to the previous interview, which took place at least 1 year earlier.<sup>16</sup> The estimates from equation (2) are shown in Table A1 in the appendix. The instruments are jointly significant at the 1 per cent level. We use these estimates to construct the inverse mills ratio, which is appended to the set of control variables in equation (1). The selection correction term turns out not to be significant in most cases and the estimates change very little when it is included in equation (1). Nonetheless, all reported results take into account this selection correction.

## 4.2 Results

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<sup>16</sup> Attrition in our sample is predominantly at the household level. Moreover, very few households (3.7% in the entire sample) have migrated out of their village of residence and additional means have been invested to track them (Mesnard, 2009) so attrition is mostly due to non-willingness to answer.

We next turn to the estimates from our equation of interest, equation (1), which are shown in Table 6. We see from column 2 that the permanent absence of the father from the household increases significantly participation in work, by around 3 percentage points. Interestingly we see from column 1 that the increase in work comes entirely from schooling (and not leisure) since the absence of the father has a significant negative effect on school enrolment, of around 4 percentage points.<sup>17</sup> The effects are not significantly different by gender (columns 3 and 4).

An important reason why these negative effects on schooling and positive effects on work may be expected, discussed in section 2, is that households in which the father left permanently incur a substantial income reduction. To investigate the extent to which the income loss associated with the absence of the father underlies the estimated impacts, we interact it with education of the head (as at baseline, i.e. pre-departure), a proxy for household income. On the one hand, households with relatively low educated heads have less to lose from a departure through an “income effect”.<sup>18</sup> On the other hand, the relatively less well off are more likely to face credit constraints and insurance market failures, and to have fewer formal ways to mitigate the impacts of income losses, such that they are likely to suffer more from father’s absence. Accordingly, the interaction effect can go in both directions and we test it empirically in columns 5 and 6. We see that the detrimental effects of father’s absence on schooling and child labour are driven by relatively less well educated households. This highlights the importance of liquidity constraints for these households, which

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<sup>17</sup> This suggests that child labour and schooling are strong substitutes, in contrast to Ravallion and Wodon (2000) who find that increases in schooling in Bangladesh following a welfare program only partially come from decreased child labour.

<sup>18</sup> Similarly, if paternal education is positively correlated with paternal quality as a figure head/role model, then one would expect the loss of a high educated father to involve the loss of a more positive impact on the child’s life.

dominates the effect entailed by their relatively lower loss of income in case of departure.

[TABLE 6 HERE]

We also allowed for the effects of departure to vary depending on when the departure occurred, whether at first or second follow-up, as proxies for long- and short-term effects respectively. Estimates are shown in columns (7) and (8) of Table 6. We do not find that the effects are significantly different depending on when the departure took place.

Finally, we checked whether the effects vary depending on the reason for the father's absence, allowing for the effects of death and divorce to be different. A caveat is that the incidence of death is very low, affecting just 1% of our sample of households (compared to 4.5% for divorce), resulting in its effects being imprecisely estimated. The results (available upon request) show that the impacts appear driven mainly by divorce, though we cannot reject that the coefficient estimates are statistically the same. In what follows, we continue to pool these events as we are interested in events which we are fairly confident induce permanent income reductions. Another reason for combining them is to maintain statistical power given the rarity of the events.

## **5 Do conditional cash transfers help protect children?**

### **5.1 The CCT Program**

In order to evaluate the impacts of the *Familias en Acción* CCT program, a representative stratified sample of municipalities was selected to receive the CCTs ('treatment' municipalities). Strata were defined in terms of region and an index of

infrastructure relating to health and education. Some municipalities from the same strata that were excluded from receiving the CCTs, but that were as similar as possible to treatment municipalities in terms of population, area and an index of quality of life, were chosen as controls.<sup>19</sup> A total of 122 municipalities were chosen for the evaluation, among which 70 received the CCTs, which was phased in during the period we are considering: 26 received CCTs by the time of the baseline survey ('early-treat'), 31 by first follow-up ('mid-treat') and 13 by second follow-up ('late-treat'). The final evaluation sample comprised approximately 100 eligible households randomly selected in each of these 122 municipalities. Attanasio et al (2010) contains an evaluation of its main impacts.

## **5.2 The CCT Program and Divorce**

Before studying the interaction between the CCTs and permanent absence of the father, we address the potential concern that absence of the father - particularly in the case of divorce - may be affected by the CCTs. Indeed there is some evidence of positive effects of the PROGRESA CCTs on the divorce rate in Mexico (Bobonis 2011) and of the *Familias en Acción* CCTs increasing women's bargaining power (Attanasio, Battistin and Mesnard, 2012). Given this, one might expect women receiving CCTs to transit more readily into and out of relationships.

To estimate the effect of the CCTs on divorce we use data from the first and second follow-ups only (as there is no variation in the outcome, parental divorce, at baseline - see footnote 3). This means that the identification of the effect of the CCTs on divorce

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<sup>19</sup> The evaluation design was carried out by a consortium led by the Institute for Fiscal Studies, and included the authors of this paper.

comes from the roll-out of the program to late-treat areas at time 3. We estimate the following regression at the household level on our sample of households

$$y_{jt} = \alpha_0 + \alpha_1 A_j + \alpha_2 T_{jt} + X'_{jt} \alpha_3 + I'_{jt-1} \alpha_4 + \delta_t + u_{jt} \quad (3)$$

pooling  $t=2$  and  $t=3$ , where  $y_{jt}$  is a dummy variable indicating whether the parents living in area  $j$  divorced between periods  $t-1$  and  $t$ ,  $A_j$  is an area dummy (early-treat, mid-treat, late-treat, control),  $T_{jt}$  is an indicator equal to one if household  $j$  lives in a municipality that is receiving CCTs at time  $t$  and 0 otherwise. Note that  $T_{jt}=1$  for  $\{(early-treat=1 \text{ or } mid-treat=1) \text{ and } time=2,3\}$  and  $\{late-treat=1 \text{ and } time=3\}$ ;  $X_{jt}$  are time-varying household and area characteristics including household composition, home ownership and altitude and  $I_{jt-1}$  is a vector of dummies indicating whether the household experienced a crop loss, business loss or illness in period  $t-1$ .

The results, displayed in Table 7, show that  $\alpha_2$  is low and not significantly different from zero, suggesting that the CCTs are not significantly correlated with divorce amongst our sample.<sup>20,21</sup> Given this evidence, we take father's absence as uncorrelated with CCTs in what follows.

[TABLE 7 HERE]

### 5.3 Interaction Effects

There is a growing literature on the safety net role played by CCTs in the presence of income shocks but, to our knowledge, no work has been done on studying the case of

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<sup>20</sup> As a further check, we compared the characteristics of households that divorce, across treated and control areas and found them to be very similar.

<sup>21</sup> We also checked that, pooled together, death and divorce are not significantly correlated with CCTs.

risk entailed by permanent loss of income. To investigate whether the effects of the father's permanent absence on children's outcomes differ depending on whether CCTs are in place, we augment equation (1) to include an interaction between our variable of interest, father's permanent absence, and receiving the CCTs, and estimate the following model

$$y_{ijt} = \alpha_0 + \alpha_1 D_{jt} + \alpha_2 D_{jt} * T_{jt} + \alpha_3 T_{jt} + X'_{ijt} \alpha_5 + I'_{jt-1} \alpha_6 + \delta_t + f_j + u_{ijt} \quad (4)$$

where  $T_{jt}$  is equal to one if household  $j$  lives in a municipality that is receiving CCTs at time  $t$  and 0 otherwise and all other notation is as defined in equation (1). As before, this variable reflects the gradual roll-out of the program, so  $T_{jt}=1$  for {early-treat=1 and time=1,2,3}; {mid-treat=1 and time=2,3}; {late-treat=1 and time=3}.

In equation (4), the coefficient of interest,  $\alpha_2$ , measures the extent to which receiving CCTs mitigates the effect of the permanent absence of the father,  $\alpha_1$ .<sup>22</sup> Note that the above specification also implicitly controls for pre-program differences in outcomes across treatment and control municipalities (through fixed effects), which is potentially important given the non-experimental setting.

We see from Table 8 that in municipalities not receiving the CCTs, the permanent absence of the father reduces school enrolment and increases child labour, particularly amongst the relatively less educated households (left hand columns): this is picked up by the coefficient  $\alpha_1$  which estimates the effect of departure in the absence of CCTs. Added to this, the second row,  $\alpha_2$ , shows that, when CCTs are in place, these adverse

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<sup>22</sup> Note that due to the gradual phasing in of the CCTs, the 'early-treat' municipalities do not contribute to identifying  $\alpha_3$ , the impact of the CCTs, as there are no pre-program data collected for these municipalities. However we retain them in the analysis as they do contribute to identifying  $\alpha_1$  and  $\alpha_2$ .

effects are offset (as shown by  $\alpha_1 + \alpha_2$ ). Other coefficients of interest in the table show that the ‘raw’ effect of the CCTs (i.e. for the large majority of households not affected by departure of the head), given by  $\alpha_3$ , is to increase school enrolment and reduce child labour, as seen in Attanasio et al (2010).

[TABLE 8 HERE]

Finally, as a robustness check, we restrict the comparison to households living in municipalities eligible for the CCTs falling within the common support, i.e. the region over which treated individuals have a counterpart in the group of controls (according to the propensity score). In line with Attanasio et al (2010), we do this by matching treatment and control observations using kernel-weighted propensity score matching, and impose common support by dropping 10% of the treatment observations at which the propensity score density of the control observations is the lowest. The results are qualitatively similar and shown in Table A2 of the Appendix.

The fact that the welfare program provides insurance to protect the very poor children from the adverse consequences of a father’s permanent absence is, perhaps, not very surprising to the extent that the CCTs received represent a sizeable share of income for these households, around 20% of their monthly labour income (see Mesnard, 2009), and that the drop in household labour earnings entailed by father’s departure is of a similar magnitude. Moreover, the welfare program is in place on a permanent basis, which gives some credence that the insurance it provides will continue as long as the child is enrolled in school. Interestingly this result is somewhat distinct from De Janvry et al (2006), who show that PROGRESA did not prevent children from working more following shocks due to unemployment and illness of the household

head, as well as natural disasters in the community, though it fully protected their schooling.

Taken together, our results point towards the existence of credit and insurance market imperfections, with adverse implications for children, who play an important role in cushioning the household against the income losses entailed by departure of fathers. Whilst one cannot rule out the psychological impacts of a parent departing playing a role too, we believe they are of secondary importance to the income loss channel. In particular, we have no reason to believe that psychological impacts would be stronger amongst the less well educated and no easy way to explain why the CCTs would help mitigate such effects.

## **6 Conclusion**

This paper has investigated the link between the permanent absence of the father from the household and the school enrolment and work participation of children in rural Colombia. We find that absence of the father decreases schooling, by around 4 percentage points, and increases participation in work, by a similar amount, around 3 percentage points. We provide evidence that these effects are mainly driven by households with relatively less educated heads, which, of the indigent households in our sample, are the very poorest. We have shown that receiving conditional cash transfers offsets these adverse consequences, offering the households a form of insurance when the father leaves the household for good. This suggests that the income reduction associated with father's absence is the main mechanism at play.



Our results have a number of important policy implications. First, they suggest that credit and insurance market failures are potentially important in the context of rural Colombia, and can contribute to lower human capital accumulation of children. Second, an event such as the permanent departure of the father has potentially important consequences for the schooling and work of children, in particular those with relatively low levels of education, who are particularly vulnerable to such permanent income losses given insurance market failures. Third, such adverse effects can be offset by well designed conditional cash transfer programs targeted to very poor households, which, in the case of Colombia, represent on average around 20% of total household labour income and are given on a permanent basis.

The latter finding is the first of this kind, and offers an important agenda for future work. An important question is whether this finding also holds for investments other than schooling (such as children's health and nutrition) and in other contexts and environments. Another question is whether this should be taken into account in the design of safety nets and their targeting to lone parents, as it may also have the unintended consequence of promoting single parenthood. A final thought is on the particular relevance of these findings for sub-Saharan Africa, which has seen a dramatic rise in orphanhood due to the prevalence of HIV/AIDS, with currently around 1 in 10 children orphaned. Families and communities have been sharing the burden of this, and it is maybe time for government support to be put in place to help households cope with this.

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## 8 Tables

<b>Table 1. School and work participation, by age and gender</b>						
	<b>Males</b>			<b>Females</b>		
	<b>School enrolment</b>			<b>School enrolment</b>		
		<b>%</b>			<b>%</b>	
<b>Age at baseline</b>	<b>Baseline</b>	<b>First</b>	<b>Second</b>	<b>Baseline</b>	<b>First</b>	<b>Second</b>
<b>7</b>	0.904	0.928	0.963	0.922	0.953	0.97
<b>8</b>	0.935	0.951	0.933	0.961	0.959	0.947
<b>9</b>	0.952	0.943	0.895	0.966	0.96	0.918
<b>10</b>	0.932	0.907	0.813	0.958	0.95	0.867
<b>11</b>	0.917	0.884	0.764	0.935	0.901	0.835
<b>12</b>	0.856	0.782	0.675	0.897	0.859	0.786
<b>13</b>	0.791	0.755	0.577	0.832	0.791	0.633
<b>14</b>	0.66	0.62	0.457	0.74	0.728	0.536
<b>N</b>	6090	5726	5033	5589	5266	4482
	<b>Work participation</b>			<b>Work participation</b>		
		<b>%</b>			<b>%</b>	
<b>10</b>	0.021	0.019	0.083	0.01	0.006	0.045
<b>11</b>	0.031	0.05	0.132	0.012	0.025	0.057
<b>12</b>	0.057	0.093	0.209	0.029	0.042	0.117
<b>13</b>	0.109	0.148	0.284	0.057	0.086	0.143
<b>14</b>	0.213	0.285	0.371	0.091	0.169	0.203
<b>N</b>	3672	4233	5022	3265	3870	4480
Notes: Work includes paid and unpaid activities and look for work as a main activity.						
N denotes the number of individuals (aged 7-14 at baseline) present in the survey listed at top						

<b>Table 2. Comparison of baseline (pre-departure) characteristics across households that do and do not experience subsequent departure</b>					
<b>Characteristic, Baseline ↓</b>		<b>Permanent absence of father (D)</b>			
		<b>D=1</b>	<b>D=0</b>	<b>p-value</b>	
Age of household head		42.88	42.21	0.182	
Age of spouse		37.81	37.14	0.110	
<i>Education of head</i>					
None		0.282	0.230	<b>0.015</b>	
Some (complete/incomplete primary)		0.535	0.638	<b>0.000</b>	
High (incomplete secondary or more)		0.181	0.132	<b>0.004</b>	
<i>Education of spouse</i>					
None		0.199	0.195	0.846	
Some (complete/incomplete primary)		0.633	0.661	0.238	
High (Incomplete secondary or more)		0.168	0.144	0.171	
<i>Household composition</i>					
Ave # of kids ≤ 6		0.388	0.467	<b>0.011</b>	
Ave # of boys 7-11		0.727	0.738	0.775	
Ave # of girls 7-11		0.718	0.684	0.366	
Ave # of boys 12-17		0.635	0.641	0.890	
Ave # of girls 12-17		0.581	0.590	0.809	
Ave # of female adults		1.232	1.244	0.708	
Ave # of male adults		1.366	1.396	0.432	
School enrolment rate of 7-14 yr olds in household		0.924	0.899	0.057	
Household monthly consumption		421286	441994	0.085	
Program area		0.700	0.682	0.453	
Altitude		574.457	601.900	0.451	
N		426	5720		
Notes: Characteristics pertain to baseline. Sample consists of households where both parents are present at baseline and there is a 7-14 year old. N = number of households at baseline.					
P-values are based on standard errors clustered at the municipality level.					



Table 3. Common Trends: Schooling and Income						
	School enrolment <sup>A</sup>					
Year = 2002	0.0343**					
	(0.005)					
Absence * Year=2002	0.0238					
	(0.0143)					
N <sup>1</sup>	11679					
	Per capita income <sup>B</sup>					
Year = 2000	0.498**					
	(0.111)					
Year = 2001	1.1019**					
	(0.1432)					
Absence * Year = 2000	-0.0845					
	(0.4641)					
Absence * Year = 2001	0.6144					
	(0.6028)					
N <sup>2</sup>	5066					
Notes:						
<sup>A</sup> Dependent variable is school enrolment. Estimates from household						
fixed effects model; also control for quadratic in child age, gender. Reference year = 2001.						
<sup>B</sup> Dependent variable is per capita household labour income. Estimates						
from household fixed effects model; also control for XXXXX. Reference year = 1999.						
N <sup>1</sup> is the number of children in the sample at baseline with non-missing school						
N <sup>2</sup> is the number of households in the sample at baseline that report income						
retrospectively for 1999, 2000 and 2001.						
Standard errors, clustered at municipality level, in parentheses.						

Table 4. Correlation between divorce and shocks in previous period						
		Divorce <sub>(t)</sub>				
Crop loss <sub>(t-1)</sub>		-0.0033				
		(0.0045)				
Business loss <sub>(t-1)</sub>		0.0205				
		(0.0181)				
Illness <sub>(t-1)</sub>		-0.0061				
		(0.0071)				
N		5796				
Notes: Dependent variable is divorce. Reference year = 2001.						
Estimates from household fixed effects model pooling first and						
second follow-ups; also control for time dummies.						
N is the number of households remaining in the sample by first follow-up.						
Standard errors, clustered at municipality level, in parentheses.						

<b>Table 5. Comparison of characteristics across households that do and do not attrit at any time after baseline</b>								
<b>Baseline Characteristics</b>		<b>Did not attrit</b>			<b>Did attrit</b>	<b>p-value difference</b>		
Age of head			42.1123		42.3617		0.5057	
Age of spouse			37.1413		37.4586		0.2987	
Head no education			0.2309		0.2497		0.2263	
Spouse no education			0.1927		0.2120		0.1889	
Head some education			0.6321		0.6208		0.5251	
Spouse some education			0.6579		0.6655		0.6668	
Head high education			0.1365		0.1260		0.4047	
Spouse high education			0.1493		0.1225		0.0398	
Treated area			0.6844		0.6756		0.6064	
Altitude			577.69		726.43		0.0000	
Crop loss at first survey			0.1339		0.1249		0.4708	
Owens house			0.6466		0.5321		0.0000	
N			5289		857			
Notes: Characteristics pertain to baseline. Sample consists of households where both parents are present at baseline and there is a 7-14 year old. N = number of households at baseline. P-values are based on standard errors clustered at the municipality level.								

Table 6. Marginal effects of the father's absence on children's schooling and work							
	School	Work	School	Work	School	Work	Work
Permanent Absence	-0.0412* (0.0172)	0.0301+ (0.0166)	-0.0422+ (0.0233)	0.036 (0.0232)	-0.0556** (0.0193)	0.0361+ (0.0183)	-0.0657** (0.0217)
Permanent Absence * Girl			0.0021 (0.0241)	-0.0122 (0.0245)			
Permanent Absence * High Educated Father (baseline)					0.0742* (0.0313)	-0.0324 (0.0296)	
Permanent Absence * Second Follow-up							0.0417 (0.0331)
							-0.0234 (0.032)
N	32186	24542	32186	24542	32186	24542	32186
Number of households	6,146	5,973	6,146	5,973	6,146	5,973	6,146
Notes: Marginal effects from a fixed effects linear probability model reported (equation (1)). Also control for absence of father for unknown reason, absence of both parents, time dummies (time 3 omitted), cubic in child age, sibling composition, inverse mills ratio.							
High Educated = 1 if incomplete secondary or more, 0 otherwise.							
N is the number of children in the sample pooled across three waves.							
Schooling observed for all children in sample, i.e. ≥7; work observed for children ≥10.							
Robust standard errors clustered at municipality level in parentheses.							
+ significant at 10%; *significant at 5%; ** significant at 1%.							

**Table 7. Marginal Effects of CCTs on Divorce**

		<b>Pr (Divorce = 1)</b>	
CCTs		-0.0066	
		(0.0080)	
Area		-0.0004	
		(0.0092)	
Time = 2		-0.0356	
		(0.0037)	
# unique hhs		5796	
N		10945	
Notes: Pools first and second follow-up surveys.			

<b>Table 8. Cushioning effects of CCTs:</b>				
<b>Marginal effects on schooling and work</b>				
	<b>Low Ed</b>		<b>All</b>	
	<b>School</b>	<b>Work</b>	<b>School</b>	<b>Work</b>
Permanent Absence	-0.103** (0.0341)	0.0786* (0.0355)	-0.0801** (0.0284)	0.0693* (0.0300)
Permanent Absence * CCTs <sup>1</sup>	0.0818* (0.0381)	-0.0691+ (0.0356)	0.0566+ (0.0330)	-0.0542+ (0.0307)
CCTs <sup>1</sup>	0.0143 (0.0123)	-0.0257** (0.0095)	0.0121 (0.0112)	-0.0252** (0.0090)
Time = 2	0.116 (0.0992)	-0.203* (0.0876)	0.0853 (0.0906)	-0.151+ (0.0800)
Time = 3	0.0344 (0.105)	-0.151 (0.0919)	0.0048 (0.0962)	-0.102 (0.0837)
N	28027	21475	32186	24542
N	5,316	5,177	6,146	5,973
Notes: Marginal effects from a fixed effects linear probability model reported (equation (1)). Also control both parents, time dummies (time 3 omitted), cubic in child age, sibling composition, inverse mills ratio.				
<sup>1</sup> CCTs indicates whether the household lives in a municipality that is receiving CCTs at the time of the survey pooled across three waves. 6146 households				
Schooling observed for all children in sample, i.e. ≥7; work observed for children ≥10.				
Robust standard errors clustered at municipality level in parentheses.				
+ significant at 10%; *significant at 5%; ** significant at 1%.				

## 9 Appendix

**Table A1. Probability of not leaving the sample, marginal effects**

	Dep vble=probability of not leaving the sample
female	0.0050 <sup>+</sup> (0.0030)
dummy variable survey 3	0.0354** (0.0068)
house	0.0564** (0.0212)
urban	0.0075 (0.0066)
_Idate_2	0.0067 (0.0151)
_Idate_3	-0.0068 (0.0197)
_Idate_4	0.0119 (0.0153)
_Idate_5	0.0299 (0.0118)
_Idate_6	0.0050 (0.0159)
_Idate_7	0.0273 <sup>+</sup> (0.0129)
_Idate_8	-0.0072 (0.0176)
_Idate_9	0.0006 (0.0158)
_Idate_10	0.0219 (0.0121)
_Idate_11	0.0221 (0.0145)
_Idate_12	-0.0196 (0.0241)
_Idate_13	-0.0104 (0.0193)
_Idate_14	-0.0060 (0.0183)
_Idate_15	-0.0018 (0.0193)
_Idate_16	-0.0233 (0.0214)
_Idate_17	0.0115 (0.0169)
_Idate_18	0.0206 (0.0143)
_Idate_19	-0.0030 (0.0205)
_Idate_20	-0.0057 (0.0227)

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_Idate_21	0.0006 (0.0216)
_Idate_22	0.0109 (0.0165)
_Idate_23	0.0030 (0.0180)
_Idate_24	0.0032 (0.0150)
_Idate_25	0.0183 (0.0135)
_Idate_26	0.0023 (0.0181)
_Idate_27	0.0021 (0.0157)
_Idate_28	0.0220 (0.0138)
_Idate_29	0.0273 <sup>+</sup> (0.0115)
_Idate_30	0.0352* (0.0102)
_Idate_31	0.0271 (0.0121)
respondent_head	0.0126 (0.0175)
respondent_spouse	0.0572** (0.0252)
Observations	23,679
p-value test of joint significance of instruments	0.0000
Robust standard errors in parentheses	
** p<0.01, * p<0.05, + p<0.1	

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**NOTES:-** Marginal effects from a probit model (see equation (2) in text). Robust standard errors clustered at municipality level in parentheses. <sup>+</sup> significant at 10%; \*significant at 5%; \*\* significant at 1%.



**Table A2 effect of father's absence estimated from Conditional Logit Model**

Table A2. Marginal effects of the father's absence on children's schooling and work						
Estimates from Conditional Logit Model						
	Schooling	Work	Schooling	Work	Schooling	Work
Permanent Absence	-0.507*	0.550+	-0.488*	0.661+	-0.555*	0.515
	(0.223)	(0.309)	(0.245)	(0.349)	(0.231)	(0.317)
Permanent Absence * Girl			-0.0423	-0.241		
			(0.267)	(0.376)		
Permanent Absence * High Educated Father (baseline)					0.555	0.471
					(0.847)	(1.007)
Permanent Absence * Second Follow-up						
# unique hhs	1829	1064	1829	1075	1829	1075
# unique indivs	4284	2536	4284	2604	4284	2604
Notes: Marginal effects from a conditional logit model reported (equation (1)).						
Additional controls include control for absence of father for unknown reason, absence of both parents, time dummies (time 3 omitted),						
cubic in child age, sibling composition, inverse mills ratio.						
High Educated is equal to 1 if incomplete secondary or more, 0 otherwise.						

**Table A3 Program interacted with departure:**

**Marginal effects on schooling and paid work, common support only**

	Low educated only		All	
	(1)	(2)	(3)	(4)
	school	paid work	school	paid work
Departure ( $\alpha_1$ )	-0.0884 (0.0421)*	0.0327 (0.0332)	-0.0625 (0.0358) <sup>+</sup>	0.0271 (0.0279)
Departure * Treated ( $\alpha_2$ )	0.1682 (0.0583)**	-0.1804 (0.0807)*	0.1199 (0.0611)*	-0.1533 (0.0724)*
Treated ( $\alpha_3$ )	0.0167 (0.0129)	-0.0179 (0.0081)*	0.0143 (0.0117)	-0.0192 (0.0075)*
First survey	0.1157 (0.1031)	-0.3362 (0.0791)**	0.0809 (0.0951)	-0.2785 (0.0742)**
Second survey	0.0320 (0.1081)	-0.2927 (0.0831)**	-0.0011 (0.1002)	-0.2369 (0.0777)**
Departure * Treatment area ( $\alpha_4$ )	-0.0944 (0.0708)	0.1573 (0.0890) <sup>+</sup>	-0.0733 (0.0711)	0.1378 (0.0789) <sup>+</sup>
Departure * First survey ( $\alpha_5$ )	-0.0147 (0.0330)	0.0037 (0.0297)	-0.0219 (0.0278)	0.0080 (0.0255)
Observations	25,428	19,693	29,294	22,581

**NOTES:-** See notes to Table 7. Note further that we match treatment and control observations using kernel-weighted propensity score matching, and impose common support by dropping 10% of the treatment observations at which the propensity score density of the control observations is the lowest.