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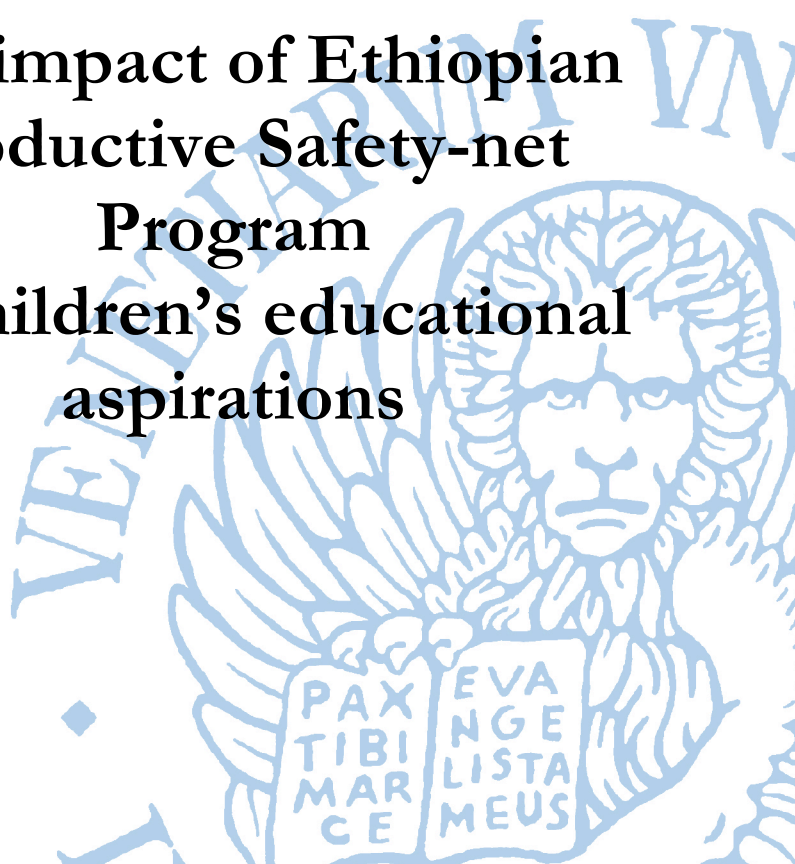
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Working Paper

**Aregawi G. Gebremariam,  
Elisabetta Lodigiani, and  
Giacomo Pasini**

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ISSN: 1827-3580  
No. 26/WP/2017





## The impact of Ethiopian Productive Safety-net Program on children's educational aspirations

**Aregawi G. Gebremariam**

*Ca' Foscari University of Venice*

**Elisabetta Lodigiani**

*University of Padua; Centro Studi Luca d'Agliano, University of Milan*

**Giacomo Pasini**

*Ca' Foscari University of Venice; NETSPAR, Le Tilburg*

### Abstract

Children's educational aspirations are important predictors of educational attainment and of occupational success. However, aspirations can be affected by whether an individual is poor or rich. This paper evaluates the impacts of Ethiopia's Productive Safety Net Program (PSNP), launched by the government of Ethiopia in 2005/06 to support food insecure rural households, on children's educational aspirations. Using longitudinal data from the Young Lives' survey in Ethiopia and applying a differences-in-differences methodology, we find that the program increases educational aspirations of children. In our preferred specification, the immediate effect of the program is to increase by 0.73 years of education aspirations of children. Furthermore, we find that aspirations are affected also in the long run, even if the point estimates are sensible to model specification. The results point to broad and long lasting positive effects of a program designed to relieve chronically poor households from food insecurity.

### Keywords

Educational aspirations, PSNP, differences-in-differences, food insecure

### JEL Codes

H43, I38, O12

*Address for correspondence:*

**Elisabetta Lodigiani**

Department of Economics and Management

University of Padua,

Via del Santo 33,

35123 Padua, Italy

e-mail: [elisabetta.lodigiani@unipd.it](mailto:elisabetta.lodigiani@unipd.it)

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# The impact of Ethiopian Productive Safety-net Program on children's educational aspirations\*

Aregawi G. Gebremariam <sup>a</sup>, Elisabetta Lodigiani <sup>†b,d</sup>, and Giacomo Pasini<sup>a,c</sup>

<sup>a</sup>Department of Economics, Ca'Foscari University of Venice, Cannaregio 821, 30121 Venice, Italy

<sup>b</sup>Department of Economics and Management, University of Padua, Via del Santo 33, 35123 Padua, Italy

<sup>c</sup> NETSPAR, Network for Studies on Pensions, Ageing and Retirement, P.O.Box 90153, 5000  
LE TILBURG, The Netherlands

<sup>d</sup> Centro Studi Luca d'Agliano, University of Milan, Via Conservatorio 7, 20122, Milan, Italy

November 1, 2017

## Abstract

Children's educational aspirations are important predictors of educational attainment and of occupational success. However, aspirations can be affected by whether an individual is poor or rich. This paper evaluates the impacts of the Ethiopia's Productive Safety Net Program (PSNP), launched by the government of Ethiopia in 2005/06 to support food insecure rural households, on children's educational aspirations. Using a longitudinal data from the Young Lives' survey in Ethiopia and applying a differences-in-differences methodology, we find that the program increases educational aspirations of children. In our preferred specification, the immediate effect of the program is to increase by 0.73 years of education aspirations of children. Furthermore, we find that aspirations are affected also in the long run, even if the point estimates are sensible to model specification. The results point to broad and long lasting positive effects of a program designed to relieve chronically poor households from food insecurity.

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\***Email addresses:** *aregawi.gebremariam@unive.it* (Aregawi G. Gebremariam), *elisabetta.lodigiani@unipd.it* (Elisabetta Lodigiani), *giacomo.pasini@unive.it* (Giacomo Pasini)

<sup>†</sup>Corresponding author: Via del Santo 33, 35123 Padua, Italy *e-mail:* *elisabetta.lodigiani@unipd.it*

# 1. Introduction

Genicot and Ray (2017) define aspirations as income or wealth reference points individuals aim to. Aspirations are important for decision making. Children’s aspirations especially may shape their labour market outcomes, and may have long-term consequences on their later life. In particular, educational aspirations are important predictors of educational attainment and occupational success (Sewell et al. 1970). Using UK longitudinal data, Schoon and Parsons (2002) find that teenage aspirations play a major role in the occupational development of the youth and in mediating social background factors. Favara (2017) documents the relationships of early aspirations with years of schooling completed in Ethiopia. From a randomized control trial conducted in Uganda, Riley (2017) finds aspirations affect exam results of students in secondary school. Moreover, Serneels and Dercon (2014) document that aspirations raise educational attainment in India. However, aspirations can be affected by whether an individual is poor or rich. Dalton et al. (2016) show that though both the rich and the poor face the same behavioral bias (internal constraints such as myopia or lack of willpower), poverty may exacerbate the behavioral bias and may lead to aspirations failure and to behavioral poverty trap. They argue that poverty is the main cause for aspirations failure in developing countries and point out that raising aspirations can break the trap. Ray (2006) states that poverty stifles individual aspirations and may cause aspirations failure which in turn lead to a self sustaining poverty trap. Moreover, Duflo (2006) also argues that poverty affects the way people think and make decisions. Due to the prevalence of chronic poverty, children in developing countries mostly fail to aspire for higher educational attainment; they simply focus on quick fix solutions and forget the bigger picture. Thus, in this paper we investigate whether the introduction of anti-poverty programs such as a safety-net program influences children’s educational aspirations in Ethiopia.

Households in developing countries not only face a labour market with excessive supply induced by the accelerating population growth, but also with limited or no social protections (Frölich and Haile, 2011). Households, therefore, become vulnerable to chronic food insecurity when they are exposed to different shocks. Safety-net programs in developing countries not only help households smooth consumption but also get households out of chronic poverty (Devereux, 2002). The change in households’ poverty status, at least psychologically, may change aspirations of their children. Kao and Tienda (1998) argue that the socio-economic status of households plays a key role not only in favouring high education aspirations in earlier grades but also in maintaining the aspired levels in later grades. Laajaj (2017) also shows that economic prospects increase the planning horizon of the poor which again pre-

dicts asset accumulations. Ethiopian government launched a social protection program in 2005, the Productive Safety-Net Program (PSNP), to provide transfers to chronically food insecure households. It is designed to supply predictable support to defined households; it is a departure from previous social protection schemes of delivering emergency food when a specific catastrophe happens. The program is expected to reach more than 10 million beneficiaries in its current phase (PSNP Phase IV - 2014/15-2019/20) and the government together with the donor community is now planning to expand it to urban areas (the first phase of urban PSNP is planned to be run from 2016/17 to 2020/21). Given the program's magnitude and the important paradigm shift from temporary relief responses to long-term preventive asset building programs, several studies have already documented the impact of the PSNP on households in different respects. [Gilligan et al. \(2009\)](#) showed the public works program of the PSNP affects individual calorie acquisition. Studies also revealed that households' food security and consumption are impacted by PSNP ([Berhane et al. 2011](#) and [Berhane et al. 2014](#)). [Sabates-Wheeler and Devereux \(2010\)](#) showed that food transfers are superior to cash transfers in affecting income growth, livestock accumulation and self-reported food security. [Andersson et al. \(2011\)](#) also evaluated the impacts of PSNP on livestock and tree holdings and find that the program increased households' tree holdings while livestock holdings are unaffected. However, studies investigating the impacts of PSNP on children are scant. [Debela et al. \(2015\)](#) and [Porter and Goyal \(2016\)](#) investigate the impacts of the program on children's health (mainly nutrition) and both studies document positive effects. Studies also investigated the impacts of PSNP on the trade-offs between education and work participation ([Hoddinott et al. 2010](#); [Woldehanna 2010](#)). However, the program is extremely expensive (in 2009, PSNP had an annual budget of 360 million USD, roughly 1.2 % of Ethiopian GDP), therefore it is important to understand whether the positive effects are limited to the immediate target of the program, namely chronic poverty and food insecurity of rural households, or it has long lasting effects on other dimensions of individual well-being, such as for example targeted children and human capital investments.

Few studies have explored how aspirations of the poor can be lifted. For instance, [Bernard et al. \(2015\)](#) studied how aspirations of poor people in remote rural Ethiopia improved after watching documentaries of people in the same status changing their life without outside intervention. [Chiapa et al. \(2012\)](#) explored the impacts of a social program and exposure to professionals on the aspirations of parents for their children in Mexico, and found a positive impact on the educational aspirations of parents for their children. They also checked the correlations of parental aspirations and educational attainment of children. The study mainly focused on households' aspirations for their children without involving children's

own educational aspirations. [Beaman et al. \(2012\)](#) also investigated the impact of female leadership on girls' aspirations and educational attainment exploiting a randomized natural experiment in India, and found a significant impact of female leadership on girls' career aspirations and educational attainment. [Ross \(2017\)](#) studied the impact of India's National Rural Employment Guarantee Scheme (NREGS) on occupational aspirations and aspirations gaps of children using the Young Lives data for India. However, it is appealing to see whether actual transfers targeted to the most disadvantaged households as in PSNP in Ethiopia, have an effect on children's own educational aspirations.

The paper is organized as follows. The next section discusses the Productive Safety-Net Program and its eligibility criteria in selecting beneficiaries. Section 3 describes the data we use in our study. Section 4 presents the methods used and the results obtained. Section 5 provides some robustness checks. Section 6 renders associations of aspirations and actual outcomes. The last section concludes.

## 2. The Productive Safety-Net Program (PSNP)

The Productive Safety-Net Program (PSNP) is a social protection program launched by the Ethiopian government in 2005 to provide transfers to chronically food insecure households. The PSNP aims to respond to food insecurity arising from shocks or natural calamities such as drought, flooding, pests, and so on, in addition to the chronic food needs of poor households. The PSNP consists of 80% public work program that provides countercyclical employment mostly on rural infrastructure and land rehabilitation projects and 20% direct support program that provides unconditional cash or food transfer to vulnerable households that have no able-bodied members to participate in public works. Once households have become food-sufficient, they will be graduated<sup>1</sup> from the program ([Wiseman et al., 2010](#)). The number of people supported by PSNP has increased from 4.5 million in 2005 to 7.6 million in 2009.

The PSNP has been designed to respect the responsibilities of each level of the federal administrative structure of the Ethiopian Government, which is composed of nine regions and two administrative cities. Each region is then divided into woredas (districts), which are administered by locally elected councils.<sup>2</sup> Each woreda is subdivided into kebeles, the lowest

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<sup>1</sup>The term 'graduation' refers to the movement of a household out of the PSNP. This occurs when a household has improved its food security status to a level that shifts it from being classified as chronically food insecure to food sufficient, and thus is no longer eligible for the PSNP.

<sup>2</sup>There are a total of 710 woredas.

administrative layers that can be understood as neighborhood associations or wards. Finally, in the rural areas, each kebele includes a number of villages or communities (Wiseman et al., 2010). The selection process into PSNP proceeds as follows. The federal government first identifies chronically food insecure woredas, i.e. districts that have been recipients of food aid for at least 3 years. Using this criterion, the government identified 262 chronically food insecure woredas in 2005 and increased to 290 woredas in 2009. Then, woredas select chronically food insecure kebeles. Finally, households within these kebeles are selected to participate in the PSNP according to a process that takes place at the community, kebele and woreda levels. First, eligibility to PSNP depends on whether a household meets the criteria set by the local administration (kebele), and whether the household is selected by the Community Food Security Task Force (CFSTF). Then, the list of eligible households, finalized at the community level, should be approved at the kebele, woreda and regional levels (Wiseman et al., 2010). The CFSTF select households on the basis of basic PSNP criteria, and supplementary local criteria. The basic PSNP eligibility criteria are: Households that faced a continuous food shortage, for 3 months in the last 3 years; those that suddenly become more vulnerable and couldn't support themselves over the last 3 to 6 months; and those without family support and other social protections (Ministry of Agriculture, 2014).

### 3. The Data

This study uses a longitudinal data from the Young Lives (YL) survey. YL is an international research project, coordinated by the University of Oxford, which follows the lives of 12,000 children in four developing countries, namely Ethiopia, India, Peru and Vietnam over 15 years. The aim of the project is to identify the main drivers of child poverty, and assist local policy makers. The sample in each country consists of two cohorts of children: a Younger-Cohort of 2000 children born in 2001-2002, and an Older Cohort of 1,000 children, born in 1994-95. To date, there are four rounds of the surveys which have been conducted in 2002, 2006, 2009 and 2013, respectively. Focusing on Ethiopia, YL samples were selected from 20 sentinel sites following a three-stage sampling process. In the first stage, 5 regions, including Oromia, Amhara, SNNP, Tigray, and Addis Ababa, an administrative city, were selected. The main criterion was national coverage, and the selected regions account for 96% of the national population. Then from these regions, 20 woredas (districts) were chosen with a pro-poor bias: the food deficit woredas were oversampled as the major goals of YL is investigating childhood poverty and its dynamics. In the last stage, at least one kebele (the smallest administrative unit) in each woreda was chosen, in order to constitute the sentinel

sites. Finally, households containing children were randomly selected within the sites.<sup>3</sup>

The YL data include questions on educational aspirations and other related issues, which were asked to the older cohort from the second round onwards (the children of the younger cohort were too young to be asked about their aspirations in the second (then aged 4 to 5 years) and third (aged 7 to 8 years) rounds of the survey). The question on educational aspirations was framed as: "Imagine you had no constraints and could study for as long as you liked, or go back to school if you have already left. What level of formal education would you like to complete?". The answer to this question is coded according to the highest grade the child aspires to achieve, 1 to 12 indicating grades 1 to 12; 13 for technical and vocational school and 14 for college degree and above. We recoded 14 to 15 (12 years of school plus 3 years of higher institution) to interpret educational aspirations in terms of years of education.

From the third round (2009) onwards households have been interviewed about their participation in PSNP as follows: (i) Was any member of household registered as a beneficiary of the PSNP – Public Works program? (ii) Was any member of household registered as beneficiary of Direct Support program (transfers of cash, food or other goods without requiring individuals to work)? If households response is 'Yes' to either one or both of the questions, then the household would be regarded as a beneficiary of the PSNP program and belongs to a 'treatment group'. Whereas if the response to both questions is 'No', then the household is considered as a 'control' or 'comparison' group.

In order to evaluate the effect of the PSNP on children's educational aspirations, we follow [Porter and Goyal \(2016\)](#) who estimate the impact of the PSNP on child nutrition using a differences-in-differences estimator (DID) at the child level. As in [Porter and Goyal \(2016\)](#), the second round of the YL survey (conducted in 2006) is considered as a baseline since the payment was delayed during the first year of the implementation of the program (2005/06) ([Gilligan et al., 2009](#)) and no impacts of the program were experienced in 2006 ([Woldehanna, 2010](#)).

The PSNP was conducted in rural areas and therefore we restrict the sample excluding the urban population. To improve the comparability of the groups of our analysis, two sites where no households participated in the program were dropped from the sample.<sup>4</sup>

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<sup>3</sup>Note one child per household is selected.

<sup>4</sup>The reason why there was no PSNP participation in these two sites is that the first site is a relatively richer rural area in the outskirts of Debrezeit town in the Oromia region and the second site is a densely populated rural area growing 'enset' (false banana) in the SNNP region. Hence, we can see the profiles of the two sites that they are relatively well off and we excluded them to have better comparison groups.



Our analysis is, therefore, based on the older cohort of children, living in 11 rural sites, and interviewed at the ages of 12, 15 and 19 in 2006, 2009 and 2013 respectively.

Table 1 depicts the descriptive statistics of observable characteristics for the individuals in the sample receiving the PSNP transfer (the treated group), and those living in the same areas but not enrolled in the program (the control group). No statistical difference between the mean of the treated and control groups is observed with respect to educational aspirations, future plan for education and work, gender, travel time to school, and wealth. However, the mean difference between the two groups seem to be significant with regard to household compositions (the treatment group has a lower proportion of males aged 6 to 60 than the control group), aid history (90% of the treatment group reported to have been receiving food aid prior to PSNP while 36% of the control group reported to have received aid before PSNP), caregiver’s aspirations (measured as children’s aspirations), cognitive outcome (based on the score obtained on a mathematical test) and climatic shocks (a dummy that takes the value of 1 if the household has experienced any natural disasters since the previous wave). One concern of our analysis is that households receiving transfers from PSNP are different from those not enrolled in PSNP for reasons that could affect our outcome of interest. However, our econometric analysis will account for observable differences of the treatment and the control groups by directly controlling for several covariates and by applying matching techniques.

## 4. Econometric strategy and results

This section describes the methodology used and the main results of our analysis. The effect of PSNP on educational aspirations of children is analyzed using the differences-in-differences (DID) estimator. Our objective of interest is to measure the average treatment effect on the treated (ATT). The ATT is given by:

$$ATT = E[A_1 - A_0|P = 1] = E[A_1|P = 1] - E[A_0|P = 1] \quad (1)$$

Where  $A_1$  is the outcome, i.e. educational aspirations, of the treated,  $A_0$  is the outcome of the untreated, and  $P$  indicates the treatment status which is equal to 1 if the individual participates in PSNP and 0 otherwise. However, the problem is that we cannot observe the untreated outcome for the treated,  $E[A_0|P = 1]$ . We use the counter-factual outcome,  $E[A_0|P = 0]$ , as an estimate for the unobserved outcome,  $E[A_0|P = 1]$ . This might give rise to the problem of selection bias, and to the concern that changes in the outcome of

interest would have been systematically different in the treatment and control groups even in the absence of the program. In our context, the PSNP was introduced to help chronically and transitory food insecure rural households and to enable them withstand shocks like droughts which are frequent in Ethiopia. Table 1 confirms that selection of households is done in a non-random way and makes it difficult to select comparison groups. In addition, we cannot test the assumption that trends in educational aspirations would be the same for the treatment and control groups in the absence of the program, the so-called common trends assumption, as children were not asked about their educational aspirations in the first round of the survey.

In order to address these concerns, we follow a similar approach to the one carried out by Porter and Goyal (2016) that analyze the impact of PSNP on child nutritional outcomes. First, we add a large set of child and household control variables to control for observable characteristics, including access to aid in previous rounds, climatic shocks, parental educational aspirations and sentinel site fixed effects. Second, by means of a propensity score matching procedure, we restrict the sample in order to improve the comparability of the treatment and control groups. Then, we compare results based on the “full sample” and the “matched sample”.<sup>5</sup>

We estimate the following model:

$$A_{ihvt} = \beta_0 + \beta_1 P_{hv} + \beta_2 Y_t + \beta_3 (P_{hv} * Y_t) + \mathbf{X}_{ihvt} \beta_4 + \lambda_v + u_{it} \quad (2)$$

Where the outcome variable  $A_{ihvt}$  denotes educational aspirations of child  $i$ , in household  $h$ , living in site  $v$  at time  $t$ ;  $P_{hv}$  is a treatment dummy that equals 1 for households participating in PSNP at baseline and 0 for non-participants;  $Y_t$  is a time dummy that equals one if year is 2009 or beyond and zero if year is 2006; and  $\mathbf{X}_{ihvt}$  is a set of child and household characteristics living in site  $v$  at time  $t$ ,<sup>6</sup>  $\lambda_v$  are sentinel site fixed effects. In our case,  $\beta_3$  can be interpreted as the effect of PSNP on educational aspirations after controlling for household

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<sup>5</sup>For robustness, Porter and Goyal (2016) also restrict the comparison group using a propensity score matching technique based on pre-program observable household characteristics. In addition, they also consider a sample restriction based on households who were shortlisted for the program but were not able to participate due to budget constraints. Unfortunately, we cannot use the shortlisted comparison group because we will retain very few observations as our sample includes only the older cohort of children.

<sup>6</sup>Control variables include: a dummy for the sex of the child, travel time to school (in minutes) for children enrolled in school, a wealth index of the household, a dummy that takes the value of 1 if the household head is a male, dummies for household composition, dummies to control for the level of education of the mother, a dummy that takes the value of 1 if the household had access to aid in previous rounds, a dummy if the household had experienced climatic shocks during the period of interest, a variable indicating the cognitive outcome of the child, educational aspirations of the caregiver.

and child characteristics, and it can be estimated using ordinary least square method (Meyer, 1995). Moreover,  $\beta_1$  is the estimated mean difference in educational aspirations of children between the treatment and control groups before the intervention; while  $\beta_2$  is the expected mean change in educational aspirations from before to after the intervention period in the control group and indicates the effect of time in the absence of the program.

Figure 1 shows aspirations of the participants and the non-participants both before and after the intervention. The descriptive evidence suggests that aspirations for college increase after the program for the participants while they are pretty stable for the non-participants. This might indicate that the program raises aspirations of children.

Table 2 presents the DID estimation results of the impact of PSNP on educational aspirations of children on the 'full sample' (Panel A) and on the 'matched sample' (Panel B) for the 2009 survey round, three years after the program's commencement. Column 1 presents the results controlling for child characteristics including a gender dummy and time taken to the nearest school; household characteristics including wealth, composition and mother's education, and site level dummies. Table 1 shows that there is a significant mean difference in receiving aid prior to PSNP between the treatment and control groups. To control for possible differences in this respect, the aid history of households prior to the program introduction is added as an additional covariate in column 2. Households' experiences of different natural calamities such as drought, flooding, pests, etc. are significant contributors for their vulnerability and food insecurity, and this may also affect educational aspirations. Then, in column 3 we control for climatic shocks. Finally, in column 4 and column 5 we additionally control for cognitive outcome of children and care-giver's aspirations for the child in question, respectively. Besides, all the regressions include site dummies to control for persistent local characteristics that could affect educational aspirations, such as local labour market characteristics.

Panel A of Table 2 presents the estimation results for the full sample. PSNP has a positive and statistically significant effect on educational aspirations across all the estimated specifications. Column (1) shows that PSNP increases educational aspirations by 0.74 school years after controlling for child and household characteristics, and site level dummies. The magnitude remains similar when we additionally control for aid history of the household (column (2)). Furthermore, the impact of PSNP on educational aspirations of children increases to 0.82 school years and 0.92 school years when we control for shocks and cognitive outcome, respectively. The results convey that the magnitude and precision still stand when

we include parental educational aspirations for the child in question.<sup>7</sup>

Panel B of Table 2 depicts the DID estimation results on the matched sample. More specifically, we construct a comparison group based on a Kernel matching with bandwidth of 0.1 on the pre-program child and household characteristics, including indicators for household wealth and vulnerability which includes animal and land ownership, the number of male and female adult members, gender and age of the household head, household's aid history, housing quality, shocks, parental aspirations and cognitive outcome. We choose the Kernel matching because it satisfies the balancing characteristics. To check for balance, a 'pstest' is used after matching. The 'pstest' indicates that the mean percent bias is below 5%.<sup>8</sup> The regressions are then conducted on observations which are on the common support. Similar to the results in Panel A, we find that the PSNP has a positive and statistically significant impact at the 1 percent level on educational aspirations. The estimation results provide very similar coefficients with respect to the full sample when all the covariates are included.

As we have information on the children's educational aspirations for three periods (the baseline, 2006, and two periods after the implementation of the program), we can estimate not only the impact of the program in the short-run (after 3 years), but also in the long-run (after 6 years). Table 3 presents the DID estimates from running regressions on the 2013 sample (6 years after the start of the program), including new entrants into the program (8 households) and incumbent beneficiaries from 2009, and excluding individuals that did not take part to the 2013 interview. The results in Panel A of Table 3 reveal that the impact of the program is not different from zero except in the last column when cognitive outcome is controlled for.<sup>9</sup> There are two possible explanations for this difference in significance in the estimates on the full sample between Table 2 and 3. First, it might be that children in the treatment group have caught up those in the control group and therefore the PSNP does not exert a differential effect on the disadvantaged in the long run. An alternative explanation is that panel A estimates are biased due to graduation from PSNP. YL asks households whether they graduated, i.e. whether they are not receiving the transfer because they are not considered poor anymore. About 36% of the respondents who were treated in the 2006 wave reported that they are no more eligible. These PSNP graduates are in the treatment group but they did not receive any benefit in 2013, as those in the control group. The effect is a bias towards zero of the coefficient. The matched sample should clean at least partly this bias. In fact, evidence from the matched sample (Panel B of Table 3) is again in favour

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<sup>7</sup>Table 2 shows only the coefficients of interest. Estimation results with the full covariates are reported in Appendix A.

<sup>8</sup>See the figure in Appendix B for the balance before and after matching.

<sup>9</sup>In this case we cannot control for care-giver's aspirations, because this variable is missing.

of a statistically significant effect of PSNP on aspirations even in the long run. Due to the reduced sample size anyway, point estimates are less precisely estimated and are more model dependent than in the short run.

In general, our results suggest that the safety-net program in Ethiopia, designed to lift out the food insecure households out of the chronic poverty, also affects the educational aspirations of children. In 2009 (three years after the program intervention), an impact on aspirations is confirmed for both the full sample and the matched sample. In 2013 (six years later), however, the effect on aspirations is positive and statistically significant when the matched sample is considered or when all the covariates are included in the full sample.

## 5. Robustness checks

PSNP transfers are delivered in two variants: the public works program and the direct support program. Participants of the public works program (PWP) are required to provide labour to pre-designed public works so as to get the transfers. The direct support program, instead, is unconditional cash or food transfers to households without able-bodied members who can contribute labour to public works. The effects of the two variants on our outcome of interest might be different. From one side, studies documented that unconditional transfers have a positive impact on the livelihoods of poor households. For instance, [Haushofer and Shapiro \(2016\)](#) documented a significant impact of unconditional cash transfers on households' economic and psychological well-being in Kenya. [Baird et al. \(2014\)](#) find that both conditional and unconditional cash transfers have an impact on schooling, but conditional transfers have a higher impact provided that the conditions are school related. Therefore, we expect a positive impact of the PSNP direct support program component on aspirations of the children. On the other hand, children from households involved in the PWP may substitute working adult members either in household chores or other household tasks. This might negatively interfere with their education and their desire for education. [Haile and Haile \(2012\)](#) find that child labour, which could include domestic chores and paid works, is associated with lower educational attainment. In our sample, only 7% of the households are part of the direct support program, however we run our DID estimation only on the sample of PWP. Table 4 presents the estimation results for the full sample and the matched sample of PWP. The results are similar to the findings in Table 2.

In our main analysis, we consider only children currently enrolled in education, because the control variable distance to school (minutes) is available only for children currently attending

school. This is an important covariate to be included in our analysis, since transportation costs may discourage educational aspirations of children. Education enrollment may have an influence on the educational aspirations of children and our results might be driven by sample selection. For robustness, we include in our sample out of school children (without controlling for distance to school) and conduct the DID estimation. Table 5 depicts the impacts on aspirations for the full sample and the matched sample. The results confirm that PSNP has a positive and significant impact at the 1 percent level on the years of educational aspirations. This suggests that the results in our main analysis are not driven by sample selection.

As an additional robustness check, we consider an alternative outcome variable, whether children would like to make plans for their future education and work, which is future oriented and related to future investments. This outcome variable is an indicator of forward-looking behaviour and shown to be correlated with future investments (Dercon and Singh, 2013). Bernard and Taffesse (2014) also stated three distinctive features of aspirations: aspirations are future oriented, aspirations are goals in which people invest their time and effort to realize them, and aspirations are perceived as ambitions to reach multidimensional life outcomes that affect the individual's future behaviour. To this end, we examine whether children's desire to plan about their future work and education is also affected by PSNP. We run the DID estimation using the same sample of households as in our main analysis. In the survey, children were asked whether they wanted to make plans for future education and work as follows: "I like to make plans for my future studies and work" and the response is categorical running from 1, indicating strongly disagree, to 5, strongly agree in round three while 1 to 4 in the second round. To normalize the question, a z-score<sup>10</sup> of each observation is computed.

Table 6 presents the results of plan for future education and work. They convey that PSNP positively impacts children's desire to plan for future education and work which is in line with our results above. This indicates that the program affects children's educational aspirations which might also be reflected somewhat on their desire to plan for future education.

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<sup>10</sup>The z-score is computed by subtracting mean from each observations and dividing it by the standard deviation.

## 6. Aspirations and years of education

The aim of our paper is to explore whether educational aspirations are affected by an anti-poverty program. We claim that educational aspirations are very important for future education and work. A few studies have documented the effects of aspirations on future education (see for instance Favara (2017) for Ethiopia). In this section, we provide evidence on the correlation between aspirations and actual educational attainment in rural Ethiopia.

In Ethiopia, primary education consists of two cycles: the first cycle includes grade 1 to 4, and the second cycle includes grade 5 to 8. Even if primary education is compulsory by law (children should start going to school at age 7), late enrollment is a common phenomenon, especially in rural areas. In addition, it is quite common that children drop out of school and come back after a certain period. These behaviors lead children to reach compulsory educational targets at later age and are a barrier for further education. At the end of second cycle primary education, students are required to sit for 8<sup>th</sup> grade regional examination so as to enter high school. Secondary education consists of two cycles: the first cycle is the general secondary education including grade 9 to 10 and the second cycle is preparatory school including grade 11 to 12. Given the system, completed primary education can be already seen as a success in rural Ethiopia. Table 7 shows that on average, at age 15 and 19, children have completed about 4.8 and 7.1 years of education, respectively. Data suggest that it is crucial to increase educational attainment of young people. In this respect, educational aspirations may be of primary importance.

Table 8 presents the difference in the mean proportion of average years of schooling between those aspiring for college and those aspiring lower than college in the previous wave. Unconditional correlations show that higher aspirations in the previous wave are positively associated with the number of years of education completed at the ages of 15 (round 3) and 19 (round 4). In particular the difference in the years of education between those aspiring for college and those aspiring lower than college in the previous wave are 0.62 and 1.92 years in 2009 and 2013 respectively, and the differences are statistically significant.

Pooling the data, Table 9 tests whether the positive correlation between aspirations (lagged) and actual years of education holds after controlling for characteristics at individual and household level. More specifically, Column (1) includes individual controls (child's sex and travel time to school in minutes) and household controls (sex of household head, wealth index, mother education dummies, household composition dummies), wave dummies and village dummies and shows a positive and statistically significant effect at 1 percent level

of (lagged) aspirations on years of education. The results are robust to the inclusion of additional covariates, such as climatic shocks, cognitive outcome, and whether the household has ever received any aid before the program (column (2)).

As we want to link aspirations to actual educational outcomes, for robustness, in column (3) and (4), we include estimations only on the non-participants of the PSNP so as to partly avoid the program’s intervention. The results convey a positive association of aspirations with actual educational outcomes even when considering only the control group. This implies that aspirations are a good predictors of future actual educational attainment as it also has been confirmed by Favara (2017) for Ethiopia and Chiapa et al. (2012) for Mexico.

## 7. Conclusions

Aspirations play a key role in the investment decisions of individuals towards their future endeavors. Children’s educational aspirations especially enhances later educational attainment. However, in developing countries, aspirations might be muffled by the extreme poverty level of individuals. In understanding how to break the cycle of poverty, it is important to examine how aspirations of the poor can be encouraged. Using Young Lives’ longitudinal data in Ethiopia, we investigate the impacts of the Ethiopian PSNP on educational aspirations of children.

We consider differences-in-differences regressions on a “full sample” and we control for several covariates. We also use matching techniques to further curb the control group. The results convey significant and positive impacts of PSNP on aspirations and suggest that the program lifts up children’s educational aspirations. As the vast majority of the population of Ethiopia depends on a small agricultural livelihood, food insecurity, caused mostly by natural calamities, is a threat to the rural households who mostly depend on rain-fed agriculture. Our results imply that small transfers may mean a lot for the food insecure rural households; they could sustain their life and affect their livelihoods in different directions: in this case we show that a financial safety-net can have important spillover effects on education.

We also look at the impacts of PSNP 6 years after its implementation, in order to assess whether the program has a long-run effect on aspirations. In a longer spell between the transfers and the observed outcome, individuals may change their aspirations for reasons that remain unknown to the econometrician. Results are therefore less robust, but still point towards a positive effect of PSNP on educational aspirations of children.

All in all, we find that PSNP affects educational aspirations, which are an important deter-



minant of actual educational attainment.

## Acknowledgments

We are grateful to Kjetil Bjorvatn, Giorgio Brunello, Rachid Laajaj, and to the audiences at conferences in St. Gallen (EALE), Bari (Economics of Global Interactions Conference), Paris (DIAL 2017 Conference on Development Economics) and Addis Ababa (2017 Ethiopian Economics Association conference) for comments and suggestions. The data used in this publication come from Young Lives, a 15-year study of the changing nature of childhood poverty in Ethiopia, India, Peru and Vietnam ([www.younglives.org.uk](http://www.younglives.org.uk)). Young Lives is funded by UK aid from the Department for International Development (DFID). The views expressed here are those of the authors. They are not necessarily those of Young Lives, the University of Oxford, DFID or other funders.

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# Tables and figures

Table 1: Descriptive statistics by treatment status at the baseline (2006)

	Control	Treated	Difference	P-value
Years of education aspirations	13.6016	13.3544	0.2472	0.2312
Future plan for education and work	-0.0017	-0.1349	0.1332	0.1500
<b>Household and Child characteristics</b>				
Child's sex	0.5073	0.5294	-0.0221	0.6254
Travel time to school (in minutes)	26.8259	29.7598	-2.9339	0.1332
Wealth index	0.2065	0.1958	0.0107	0.2650
Sex of household head	0.8650	0.7149	0.1500	0.0000
Mother's education-Adult literacy*	0.1271	0.1208	0.0063	0.8403
Mother's education-Grade 1 and above	0.3877	0.1946	0.1931	0.0000
<b>Household composition</b>				
Number of males aged 0-5	0.3759	0.3710	0.0049	0.9290
Number of males aged 6-12	0.7336	0.6063	0.1272	0.0552
Number of males aged 13-17	0.6168	0.4072	0.2095	0.0002
Number of males aged 18-60	1.6387	1.3801	0.2586	0.0070
Number of males aged 61+	0.1387	0.1765	-0.0378	0.2570
Number of females aged 0-5	0.4051	0.4163	-0.0112	0.8413
Number of females aged 6-12	0.5985	0.6199	-0.0214	0.7294
Number of females aged 13-17	0.6460	0.5882	0.0578	0.3760
Number of females aged 18-60	1.6423	1.5747	0.0677	0.3834
Number of females aged 61+	0.0985	0.0679	0.0307	0.2362
<b>Parent's years of education aspirations</b>				
Years of aspirations	13.9436	13.5760	0.3676	0.0656
<b>Aid history</b>				
Ever_aid	0.3686	0.9095	-0.5409	0.0000
<b>Cognitive outcome score</b>				
Z_raw_math	-0.3608	-0.1924	-0.1683	0.0726
<b>Shocks</b>				
Shock-drought	0.5255	0.5792	-0.0536	0.2340
Shock-flooding	0.3066	0.1131	0.1934	0.0000
Shock-erosion	0.1825	0.0679	0.1146	0.0002
Shock-frost	0.1642	0.0950	0.0692	0.0243
Shock-pests on crops	0.2080	0.0498	0.1583	0.0000
Shock-crop failure	0.3358	0.3937	-0.0579	0.1833
Shock-pests on storage	0.0730	0.0407	0.0323	0.1291
Shock-pests on livestock	0.0985	0.0407	0.0578	0.0137
Observations	276	221		

\* Mother's level of education has three categories: No education (66%), Grade one and above (22%) and Adult literacy (12%).

Table 2: Impacts of PSNP on Children’s Educational Aspirations - 2009 sample

	(1)	(2)	(3)	(4)	(5)
Panel A: Full sample					
PSNP participation	-0.464* (0.244)	-0.411 (0.255)	-0.457* (0.257)	-0.465* (0.251)	-0.407* (0.236)
Year dummy (2009)	-0.372 (0.296)	-0.363 (0.298)	-0.434 (0.290)	-0.510* (0.277)	-0.460* (0.266)
DID	0.740** (0.343)	0.739** (0.343)	0.819** (0.340)	0.920*** (0.331)	0.730** (0.312)
<i>N</i>	765	764	764	756	749
Panel B: Matched sample					
PSNP participation	-0.538** (0.255)	-0.463* (0.263)	-0.515* (0.264)	-0.497* (0.259)	-0.436* (0.242)
Year dummy (2009)	-0.537* (0.304)	-0.539* (0.303)	-0.619** (0.296)	-0.585** (0.291)	-0.502* (0.280)
DID	0.901** (0.357)	0.911** (0.355)	0.999*** (0.352)	0.997*** (0.347)	0.815** (0.326)
<i>N</i>	714	714	714	714	713
Household controls & village dummies	YES	YES	YES	YES	YES
Received aid before 2006	NO	YES	YES	YES	YES
Shocks	NO	NO	YES	YES	YES
Cognitive outcome	NO	NO	NO	YES	YES
Caregiver’s aspirations	NO	NO	NO	NO	YES

Robust standard errors in parentheses, clustered at child level

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

*Notes:* The dependent variable in all columns is years of educational aspirations. Covariates includes gender and time taken to school as child controls; household controls consisting of wealth index, household head sex, mother’s education and household composition based on age and sex; shocks include drought, flooding, erosion, frost, pests on crops, crop failure, pests on storage, and pests on livestock; cognitive outcome includes z-score of maths test scores of children where the z-score is computed on the raw scores of maths test administered for the children in question; and parental aspirations are years of education that parents are aspiring for their child to complete. Village (site) level dummies are included in all columns.

Table 3: Impacts of PSNP on Children's Educational Aspirations (2013)

	(1)	(2)	(3)	(4)
<b>Panel A: Full sample</b>				
PSNP participation	-0.366 (0.372)	-0.238 (0.383)	-0.211 (0.368)	-0.129 (0.351)
Year dummy (2013)	0.853*** (0.253)	0.850*** (0.254)	0.719*** (0.270)	0.379 (0.241)
DID	0.544 (0.402)	0.548 (0.404)	0.656 (0.412)	0.923** (0.386)
<i>N</i>	416	416	416	404
<b>Panel B: Matched sample</b>				
PSNP Participation	-0.381 (0.422)	-0.210 (0.423)	-0.211 (0.401)	-0.185 (0.379)
Time dummy (2013)	0.754*** (0.269)	0.732*** (0.269)	0.625** (0.284)	0.244 (0.251)
DID	0.758* (0.451)	0.783* (0.456)	0.948** (0.463)	1.206*** (0.426)
<i>N</i>	373	373	373	362
Household controls & village dummies	YES	YES	YES	YES
Received aid before 2006	NO	YES	YES	YES
Shocks	NO	NO	YES	YES
Cognitive outcome	NO	NO	NO	YES

Robust standard errors in parentheses, clustered at child level

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

*Notes:* The dependent variable in all columns is years of educational aspirations. Covariates includes gender and time taken to school as child controls; household controls consisting of wealth index, household head sex, mother's education and household composition based on age and sex; shocks include drought, flooding, erosion, frost, pests on crops, crop failure, pests on storage, and pests on livestock; and cognitive outcome includes z-score of maths test scores of children where the z-score is computed on the raw scores of maths test administered for the children in question. Village (site) level dummies are included in all columns.

Table 4: Impacts of PSNP on educational aspirations (2009 - only PWP)

	(1)	(2)	(3)	(4)	(5)
All					
PSNP participation	-0.476*	-0.441*	-0.481*	-0.489*	-0.425*
	(0.248)	(0.257)	(0.259)	(0.254)	(0.239)
Time dummy (2009)	-0.360	-0.351	-0.424	-0.489*	-0.431
	(0.309)	(0.310)	(0.303)	(0.289)	(0.279)
DID	0.759**	0.756**	0.840**	0.932***	0.722**
	(0.355)	(0.354)	(0.351)	(0.342)	(0.324)
<i>N</i>	745	744	744	736	729
Matched sample					
PSNP participation	-0.563**	-0.499*	-0.549**	-0.535**	-0.460*
	(0.259)	(0.266)	(0.267)	(0.262)	(0.244)
Time dummy (2009)	-0.511	-0.514	-0.592*	-0.539*	-0.459
	(0.314)	(0.313)	(0.307)	(0.303)	(0.292)
DID	0.897**	0.907**	0.994***	0.979***	0.794**
	(0.368)	(0.366)	(0.363)	(0.357)	(0.338)
<i>N</i>	697	697	697	697	696
Household controls	YES	YES	YES	YES	YES
Received aid before 2006	NO	YES	YES	YES	YES
Shocks	NO	NO	YES	YES	YES
Cognitive outcome	NO	NO	NO	YES	YES
Caregiver's aspirations	NO	NO	NO	NO	YES

Robust standard errors in parentheses, clustered at child level

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

*Notes:* The dependent variable in all columns is years of educational aspirations. Covariates includes gender and time taken to school as child controls; household controls consisting of wealth index, household head sex, mother's education and household composition based on age and sex; shocks include drought, flooding, erosion, frost, pests on crops, crop failure, pests on storage, and pests on livestock; cognitive outcome includes z-score of maths test scores of children where the z-score is computed on the raw scores of maths test administered for the children in question; and parental aspirations are years of education that parents are aspiring for their child to complete. Village (site) level dummies are included in all columns.



Table 5: Impacts of PSNP on educational aspirations (2009 - Including non-enrolled children)

	(1)	(2)	(3)	(4)	(5)
Full sample					
PSNP participation	-0.570** (0.262)	-0.450 (0.278)	-0.505* (0.276)	-0.439* (0.264)	-0.385 (0.247)
Time dummy_2009	-0.530* (0.300)	-0.494 (0.301)	-0.608** (0.297)	-0.643** (0.286)	-0.578** (0.274)
DID	1.120*** (0.374)	1.072*** (0.373)	1.210*** (0.369)	1.244*** (0.354)	0.933*** (0.328)
<i>N</i>	839	837	837	824	812
Matched sample					
PSNP participation	-0.564** (0.264)	-0.458* (0.276)	-0.519* (0.272)	-0.510* (0.267)	-0.475* (0.250)
Time dummy_2009	-0.624** (0.308)	-0.621** (0.309)	-0.725** (0.302)	-0.701** (0.299)	-0.614** (0.288)
DID	1.149*** (0.382)	1.155*** (0.381)	1.294*** (0.376)	1.285*** (0.373)	0.999*** (0.346)
<i>N</i>	767	767	767	767	761
Household controls & village dummies	YES	YES	YES	YES	YES
Received aid before 2006	NO	YES	YES	YES	YES
Shocks	NO	NO	YES	YES	YES
Cognitive outcome	NO	NO	NO	YES	YES
Caregiver's aspirations	NO	NO	NO	NO	YES

Robust standard errors in parentheses, clustered at child level

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

*Notes:* The dependent variable in all columns is years of educational aspirations. Covariates includes gender and time taken to school as child controls; household controls consisting of wealth index, household head sex, mother's education and household composition based on age and sex; shocks include drought, flooding, erosion, frost, pests on crops, crop failure, pests on storage, and pests on livestock; cognitive outcome includes z-score of maths test scores of children where the z-score is computed on the raw scores of maths test administered for the children in question; and parental aspirations are years of education that parents are aspiring for their child to complete. Village (site) level dummies are included in all columns.

Table 6: Impacts of PSNP on Children's desire to plan for the future

	(1)	(2)	(3)	(4)	(5)
Full sample					
PSNP participation	-0.296*** (0.109)	-0.218* (0.114)	-0.243** (0.116)	-0.245** (0.117)	-0.246** (0.118)
Time dummy (2009)	-0.167* (0.0962)	-0.166* (0.0966)	-0.190* (0.101)	-0.196* (0.102)	-0.193* (0.103)
DID	0.267* (0.145)	0.273* (0.145)	0.288** (0.146)	0.297** (0.147)	0.282* (0.148)
<i>N</i>	763	762	762	755	748
Matched					
PSNP participation	-0.279** (0.111)	-0.204* (0.116)	-0.229** (0.116)	-0.226* (0.116)	-0.221* (0.115)
Time dummy (2009)	-0.174* (0.101)	-0.177* (0.101)	-0.204* (0.106)	-0.200* (0.107)	-0.195* (0.107)
DID	0.313** (0.146)	0.323** (0.146)	0.340** (0.146)	0.340** (0.146)	0.319** (0.146)
<i>N</i>	713	713	713	713	712
Household controls & village dummies	YES	YES	YES	YES	YES
Received aid before 2006	NO	YES	YES	YES	YES
Shocks	NO	NO	YES	YES	YES
Cognitive outcome	NO	NO	NO	YES	YES
Caregiver's aspirations	NO	NO	NO	NO	YES

Robust standard errors in parentheses, clustered at child level

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

*Notes:* The dependent variable in all columns is children's desire to plan about their future work and education. Covariates includes gender and time taken to school as child controls; household controls consisting of wealth index, household head sex, mother's education and household composition based on age and sex; shocks include drought, flooding, erosion, frost, pests on crops, crop failure, pests on storage, and pests on livestock; cognitive outcome includes z-score of maths test scores of children where the z-score is computed on the raw scores of maths test administered for the children in question; and parental aspirations are years of education that parents are aspiring for their child to complete. Village (site) level dummies are included in all columns.

Table 7: Years of education by survey rounds

Survey rounds	Average years of education	Std. Dev	N
2006 (Age 12)	2.581	1.639	494
2009 (Age 15)	4.797	2.133	482
2013 (Age 19)	7.090	2.873	412

Table 8: Education completion by lag of aspirations

Aspirations in the previous wave	2009 (R3)		2013 (R4)	
	N	Mean	N	Mean
<College	183	4.639	153	5.954
College	258	5.244	250	7.872
Difference (College - <College)		0.605		1.918
P-value		0.002		0.000

Table 9: Lag of Aspirations and actual years of education

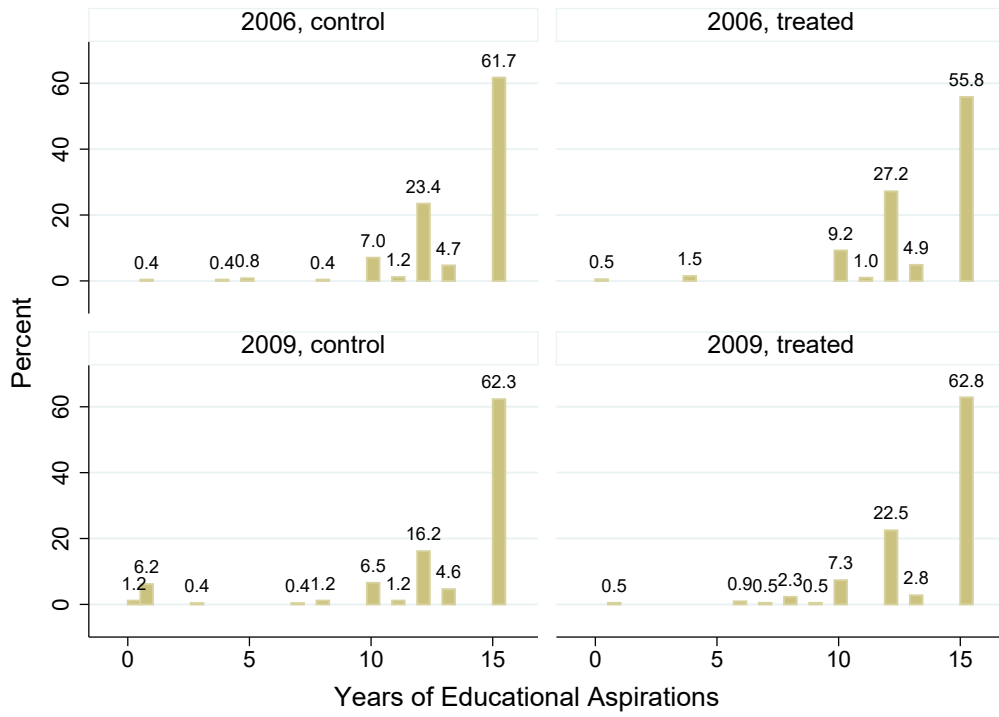
	All Sample		Non-participants of PSNP	
	(1)	(2)	(3)	(4)
Lag of years of Aspirations	0.160*** (0.0396)	0.113*** (0.0327)	0.158*** (0.0536)	0.110** (0.0429)
Constant	3.810*** (0.740)	4.556*** (0.675)	3.405*** (0.945)	3.888*** (0.865)
<i>N</i>	522	517	275	271

Robust standard errors in parentheses, clustered at child level

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

*Notes:* The dependent variable in all columns is actual years of education. Covariates include child and household controls. Columns 2 and 4 also include additional controls consisting of climatic shocks, cognitive outcome, and whether households received any aid before the program. Village (site) level dummies and year dummies are included in all the columns.

Figure 1: Years of educational aspirations by treatment status



## Appendix A    Impact of PSNP on educational aspirations (full covariates)

	(1)	(2)	(3)	(4)	(5)
PSNP participation	-0.464*	-0.411	-0.457*	-0.465*	-0.407*
	(0.244)	(0.255)	(0.257)	(0.251)	(0.236)
Time dummy_2009	-0.372	-0.363	-0.434	-0.510*	-0.460*
	(0.296)	(0.298)	(0.290)	(0.277)	(0.266)
DID	0.740**	0.739**	0.819**	0.920***	0.730**
	(0.343)	(0.343)	(0.340)	(0.331)	(0.312)
Child's sex - male	0.573***	0.574***	0.558***	0.495***	0.358**
	(0.151)	(0.152)	(0.152)	(0.148)	(0.139)
Travel time to school (in minutes)	-0.00690	-0.00712	-0.00722	-0.00617	-0.00604
	(0.00548)	(0.00547)	(0.00545)	(0.00470)	(0.00442)
Wealth index	0.0657	-0.00266	-0.0293	0.0542	-0.149
	(0.977)	(0.988)	(0.964)	(0.881)	(0.825)
Sex of household head	0.0174	0.0142	-0.134	-0.110	-0.0880
	(0.217)	(0.216)	(0.216)	(0.211)	(0.193)
momedu==Adult literacy	0.321	0.314	0.380	0.379*	0.255
	(0.233)	(0.234)	(0.231)	(0.230)	(0.208)
momedu==Religious education	1.287**	1.213*	1.787***	2.052***	1.835***
	(0.615)	(0.633)	(0.686)	(0.737)	(0.671)
mom_primary	-0.0578	-0.0731	-0.0463	-0.0459	-0.0644
	(0.251)	(0.255)	(0.259)	(0.250)	(0.243)
Number of males aged 0-5	0.184	0.182	0.167	0.283*	0.204
	(0.149)	(0.150)	(0.152)	(0.150)	(0.144)
Number of males aged 6-12	0.0751	0.0744	0.0977	0.0568	0.0187
	(0.121)	(0.121)	(0.123)	(0.120)	(0.114)
Number of males aged 13-17	-0.0588	-0.0644	-0.0193	0.0214	-0.0570
	(0.162)	(0.163)	(0.167)	(0.162)	(0.149)
Number of males aged 18-60	0.0981	0.0966	0.116	0.136*	0.102
	(0.0703)	(0.0704)	(0.0726)	(0.0711)	(0.0663)
Number of males aged 61+	0.236	0.223	0.248	0.176	0.148
	(0.194)	(0.194)	(0.192)	(0.183)	(0.166)
Number of females aged 0-5	-0.0439	-0.0415	-0.0550	-0.0492	-0.0143
	(0.136)	(0.135)	(0.134)	(0.131)	(0.123)
Number of females aged 6-12	0.176	0.173	0.174	0.0911	0.0324
	(0.127)	(0.127)	(0.128)	(0.121)	(0.112)
Number of females aged 13-17	-0.281*	-0.277*	-0.220	-0.160	-0.221
	(0.159)	(0.158)	(0.154)	(0.149)	(0.142)
Number of females aged 18-60	0.101	0.107	0.0994	0.0985	0.119
	(0.0857)	(0.0848)	(0.0842)	(0.0818)	(0.0773)
Number of females aged 61+	-0.167	-0.157	-0.158	0.0443	0.0996
	(0.310)	(0.304)	(0.304)	(0.283)	(0.273)
Sentinel site ID=5	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)
Sentinel site ID=6	-0.542	-0.522	-0.458	-0.547	-0.270
	(0.391)	(0.392)	(0.432)	(0.414)	(0.418)
Sentinel site ID=7	-0.617*	-0.621*	-0.464	-0.527	-0.413
	(0.373)	(0.373)	(0.366)	(0.339)	(0.365)
Sentinel site ID=8	-1.240***	-1.205***	-1.048***	-1.022***	-0.836**
	(0.361)	(0.361)	(0.357)	(0.334)	(0.355)
Sentinel site ID=9	-0.858**	-0.862**	-0.570	-0.540	-0.389
	(0.391)	(0.389)	(0.425)	(0.402)	(0.421)

Sentinel site ID=15	-1.089** (0.459)	-1.101** (0.460)	-0.722 (0.459)	-0.601 (0.439)	-0.873* (0.447)
Sentinel site ID=16	-0.0852 (0.398)	-0.132 (0.401)	0.00728 (0.426)	0.445 (0.403)	0.208 (0.405)
Sentinel site ID=17	0.256 (0.363)	0.272 (0.361)	0.506 (0.387)	0.296 (0.363)	0.131 (0.378)
Sentinel site ID=18	0.118 (0.378)	0.153 (0.378)	0.454 (0.414)	0.247 (0.381)	0.293 (0.389)
Sentinel site ID=20	0.361 (0.276)	0.394 (0.280)	0.440 (0.286)	0.104 (0.264)	-0.0472 (0.289)
Sentinel site ID=90	-0.189 (0.503)	-0.212 (0.503)	-0.280 (0.449)	-0.538 (0.415)	-0.803* (0.433)
ever_aid		-0.145 (0.212)	-0.0814 (0.220)	-0.0898 (0.214)	-0.0981 (0.200)
shock-drought			-0.217 (0.181)	-0.280 (0.173)	-0.300* (0.172)
shock-flooding			-0.446 (0.285)	-0.526* (0.277)	-0.495** (0.251)
shock-erosion			-0.0786 (0.355)	-0.0609 (0.346)	0.152 (0.324)
shock-frost			-0.315 (0.296)	-0.282 (0.285)	-0.234 (0.268)
shock-pests on crops			-0.237 (0.300)	-0.275 (0.294)	-0.219 (0.281)
shock-crop failure			-0.343* (0.181)	-0.242 (0.175)	-0.139 (0.163)
shock-pests on storage			0.956** (0.372)	0.885** (0.359)	0.570* (0.334)
shock-pests on livestock			1.140*** (0.226)	1.129*** (0.220)	0.882*** (0.208)
z_raw_math				0.448*** (0.0851)	0.425*** (0.0845)
Years of educational aspirations by caregiver					0.371*** (0.0786)
Constant	13.63*** (0.413)	13.71*** (0.441)	13.84*** (0.437)	13.96*** (0.406)	9.055*** (1.155)
Observations	765	764	764	756	749

Robust standard errors in parentheses, clustered at child level

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Appendix B Checking for balance after matching

