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Abbreviations

AEP	Agricultural Extension Programme
CFW	Cash for Work Programme
DSP	Direct Support Programme
EGS	Employment Generation Scheme
FFW	Food for Work Programme
GFFD	General Free Food Distribution
GR	Gratuitous Relief
PADETES	Participatory Demonstration and Training Extension System
PASDEP	Programme for Accelerated and Sustained Development to End Poverty
PETI	*Programmea de Erradicacao do Trabalho Infantil*
PSNP	Productive Safety Net Programme
PWP	Public Work Programme
SP	Social Protection
YL	Young Lives

Abstract

Government, non-government and donor organisations have developed a social assistance programme known as the Productive Safety Net Programme (PSNP) which has two sub-programmes, namely the Public Work Programme (PWP) and Direct Support Programme (DSP). PSNP is designed to reduce the vulnerability of poor people to drought. It targets households in most cases without considering *ex ante* the issue of intra-household resource distribution. This paper assesses, using Young Lives survey data, the impacts of PSNP and Agricultural Extension Programme (AEP) on time use between work and schooling, as well as the highest grade completed by 12-year-old children in rural and urban Ethiopia. Empirically the study used propensity score matching techniques to estimate the impact of PSNP and AEP on child welfare measured by time use in various types of work, schooling and studying. We found that PWP in rural areas increases child work for pay; reduces children's time spent on child care, household chores and total hours spent on all kind of work combined; and increases girls spending on studying. The DSP in rural and urban areas reduces time children spent on paid and unpaid work, and increases the highest grade completed by boys in urban areas. On the other hand, AEP in rural areas was effective in reducing child work for pay and total work, increasing time girls spent on schooling and the highest grade completed by girls.

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1. Introduction

Child labour/work and its potential causes has become a major subject of study in the economic literature of the past decade. Theoretically, children's time allocation between work and education is the result of household decisions shaped by the availability of assets, inputs, credit and insurance, the effectiveness of labour and credit markets, and parental education levels. They call this model a household production model (Becker and Tomes 1976). Based upon this model, various hypotheses exist as to what causes the incidence and intensity of child labour in developing countries. The most frequently mentioned cause of child labour is poverty: raising parents' income would mean that sending children to the labour market was no longer a necessity (Basu and Van 1998; López-Calva 2001). Without this income, parents use child labour to trade off higher current income against lower future child income as it reduces children's human capital development.[1] However, poverty isn't the only factorleading to parents involving their children in work. It has to be associated with non-positive bequests and financial market imperfections that prevent parents from trading-off old-age income with current resources, leading them to produce too much child labour relative to the first best optimum that would hold with positive bequests or perfect financial markets (Baland and Robinson 2000).

Although the poverty hypothesis suggests that there could be a positive correlation between expenditure/wealth and child schooling, liquidity constraints and imperfect labour markets may result in the opposite relationship (Bhalotra and Heady 2003; Nielson 1998). Wealth paradox (Bhalotra and Heady 2003; Nielson 1998*)* states that in the absence of perfect access to credit and with the imperfect substitution of hired labour for family labour, livestock ownership and the cultivation of larger land holdings (or the use of more labour intensive technologies in the same land size) may in fact lead to greater demands for child labour than schooling (Coulombe 1998).

Recent literature (Guarcello et al. 2003; Duryea et al. 2003; Beegle et al. 2006; Jacoby and Skoufias 1997; Jensen 2000) points out that child labour may vary depending on households' ability to respond to unexpected income shocks. Households that lack formal credit and insurance markets can increase the intensity of child labour to buffer the effects of negative economic shocks, very much like they can with sales of assets, running down savings or using informal social networks of transfers and loans. Child labour allows households to partially offset income loss directly, through child wage income; or indirectly, by freeing up adult labour from household work or chores. According to this hypothesis, increases in child labour incidence and/or intensity should be associated with households that have experienced such negative economic shocks.

To reduce the negative impact of economic shocks on children, government and non-government organisations, including donor groups, develop social protection programmes, including social assistances like conditional and unconditional cash transfer to the poor (Farrington and Slater 2006). There are studies that evaluate whether such transfers achieve the stated objectives, especially for conditional cash transfer programmes (de Janvry et al. 2006; Cardoso, Souza and Portela 2004). For example, de Janvry et al. assess the long-term effects of economic shocks on school attendance in Mexico and evaluate the effectiveness of the conditional cash transfer (CCT) programmes which are part of Mexico's Progress

1 This is known as poverty hypothesis in child labour/education literature.

programme. Using panel data from the *Progresa* (Mexican development program) experience with randomised treatment, they show that short-term shocks that take children out of school will have long-term consequences on their educational achievements. Idiosyncratic and covariate shocks pushed parents to take children out of school and to use child labour as a risk-coping strategy. Consequently they show that the Conditional Cash Transfer helps protect children from these shocks, creating an additional benefit in that these programmes are effective safety nets with long-term benefits. However, the effect of unconditional cash transfer or social assistance (one form of protection programme) on child welfare is not clearly known.

A prime concern of governments and donor organisations in developing countries, including Ethiopia, is to mitigate poverty. To address extreme poverty, governments, in collaboration with donors and non-governmental organisations, are developing various social protection strategies. Among these, the Ethiopian government introduced a public work and direct support programme popularly known as the Productive Safety Net Programme (PSNP) in 2005 to strengthen the emergency relief-based Employment Generation Scheme (EGS) in order to better address poverty and vulnerability in both rural and urban Ethiopia.

However, all of these social protection policies target the household as a whole, without focusing on the issue of intra-household resource distribution. In particular, the child welfare effect of social protection programmes is not considered by practitioners and policy-makers (at least for the programmes considered in this paper, namely PSNP, EGS and AEP). This is partly based on the assumption that child welfare will improve when household poverty is reduced. Social protection programmes, if carefully applied, may reduce household poverty, but it may be at the expense of child welfare. For example, provision of agricultural extension support may encourage households to buy fertiliser, livestock and other purchased inputs and capital in order to intensify farming. Moreover, while Public Work Programmes (PWP) increase household income and hence improve child welfare in terms of nutrition, they may also increase the demand for labour. If this demand cannot be met via adult family and hired labour, children may be subjected to heavy work both at home and outside home, which would compete with schooling and studying time. Therefore, unintentionally, the social protection programmes, which are originally designed to improve household welfare, can be damaging to children. Children, instead of going to school and/or using their free time for studying and entertainment, may be forced to spend their time engaged in activities aimed at short-term benefit, such as earning income from child labour.

Ethiopia (as indicated in the recent poverty reduction strategy known as the Programme for Accelerated and Sustained Development to End Poverty [PASDEP]) has intensified the use of public work, credit and agricultural extension support programmes in rural Ethiopia, and of micro- and small-scale enterprises in urban areas (MoFED 2006). As argued above, such polices may have detrimental effects on child welfare. The underlying assumption behind such programmes is that labour is relatively more abundant than capital, leading to the conclusion that new livelihood opportunities should be labour-intensive and agriculture-based. However, given imperfect labour and credit markets, the demand for labour may in the short term be met by involving children in either paid or non-paid work.

The public work and agricultural extension programmes implemented in rural Ethiopia require households to supply labour in order to obtain the payment. Hence, we expect public work (PSNP) and agricultural extension support programmes to have both substitution effect and income effect. The substitution effect arises because these programmes increase the demand for labour and may create an incentive to intensively use children's time and/or substitute child time for adult time in household chores, child care and works outside home.

Because these support programmes bring additional resources to the households, they have income effects in the sense that participation in these programmes increases child schooling and reduces child work.

The Direct Support Programme (DSP) component of the PSNP (cash/food and education support) has been implemented in both rural and urban areas. These programmes do not require households to supply labour to obtain the support. Hence we expect these programmes to have only income effect, not substitution effect. Therefore their effects on child labour and education would be expected to differ from that of public work and agricultural extension programmes. If the programmes are effective we expect involvement of households in cash/food aid and education support programmes to reduce child work and increase schooling and studying time.

The hypothesis of this study, therefore, is that the provision of public work and agricultural extension support programmes via the promotion of labour-intensive activities, while augmenting aggregate economic development, could be detrimental to child well-being when pursued without precautionary management measures. In order to create a win-win situation where both national economic development and children's rights (socioeconomic, civic and cultural) are realised, it is crucial to have a deep understanding of the relationship between support programmes and children's time use.

Although studies investigate the effect of support programmes on household welfare, those that examine the child welfare effect of support programmes that target households instead of children are scarce. In particular, the effectiveness of social assistance programmes designed to improve household income is not assessed well, at least in the Ethiopian and African context. This paper therefore tries to assess the impact of social protection programmes on child welfare measured by child work and education. Specifically, the objectives of this paper are:

1. To investigate whether the participation of households in PWPs and agricultural extension programmes affects children's time use between work on the one hand and schooling and study at home on the other hand.
2. To gauge the effectiveness of direct support (cash and food aid) programmes in reducing child work and increase child schooling.
3. To assess the differential impact of the support programmes on boys and girls.

The study uses propensity score matching techniques in order to estimate the impact of support programmes. Data from the Young Lives survey for the older cohort sample collected in the last quarter of 2002 and 2006 was used for the study.

The rest of the paper is organised as follows. Section two presents a brief literature review of concepts and empirical studies. Descriptions of the support programmes considered in the paper are presented in section three. Section four outlines the theoretical framework and method of estimating programme impacts as well as a description of the data used in the paper. Section four presents the results and discussion. The summary, conclusion and policy implications are highlighted in section six.

2. Literature review in brief

Definition of child labour. The literature differentiates between 'child work' and 'child labour'. The first mainly refers to work which is not particularly harmful for the child and does not damage his or her educational opportunities. On the contrary, 'child labour' relates to work which is likely to damage children's physical and psychological health and development, as well as their chances of fulfilling other rights, mainly the right to education.

According to the International Labour Office (ILO), child labour has been defined as (a) all economic activities undertaken by children under age 11; (b) all economic activity undertaken by children aged 12 to 14, excluding permitted 'light work' in the sense of Convention 138; (c) all economic activity carried out under 'hazardous conditions' by children aged 15 to 17; and (d) 'the worst forms of child labour' carried out under age 18.

The ILO's definition of child labour does not include the activities performed by children inside the house (all forms of domestic work and family care) on the ground that these kinds of work do not harm children's education, health and physical and psychological development. However, evidences show that these kinds of activities also contribute to harm children's development and learning processes, especially in the case of girls (see Knaul 1999; Lavinas et al. 2001; Levinson et al. 2001; Sedlacek et al. 2001. Cited in Anker [2000]).

In this paper, we use the terms child work and labour interchangeably because we do not want to engage in the controversy of including children's activity at home in the definition of child labour. Furthermore, we found that it is difficult to apply ILO's definition of child labour, as we are using data from children of 5 to 17 years old and the ILO definition requires a different intensity of child work for different age groups.

Theoretical models of child labour. The analysis of children's time use between work and education is done by employing models of household behaviour. Modelling of household behaviour in mainstream economics started with Becker (1965) and is known in literature as the household production model (Becker and Tomes 1976). According to the review made by (Dar et al. 2002) there are two basic types of household model commonly used by economists: bargaining models and altruistic models. In bargaining models, household behaviour is the outcome of internal bargains and power struggles (Bourguignon and Chiapori 1994). Bargaining models may be of two distinct kinds, depending on who the agents involved in the bargaining process are. Intra-household bargaining models assume that bargaining occurs within the family between parents and the child/children. Solutions to these models usually specify that a child's labour supply depends on the adult wages and child's wage that prevail on the market. In the extra-household approach, it is assumed that children have negligible bargaining power in households, and are basically an instrument for the parents' maximisation of utility. These models usually treat employers and parents of the children as the two main factors involved in the bargaining process (Dar et al. 2002).

These models contrast sharply with altruist models of child labour, in which the parents are altruistically concerned with the child's welfare. Furthermore, the altruistic classes of model are differentiated from bargaining models, as they assume multiple equilibria (Dar et al. 2002). Foremost among the altruistic models is that presented in Basu and Van (1998), which provides a framework for investigating how child labour and adult labour are interdependent in economic activity and under what conditions child labour emerges in the labour market. The main findings in their paper are essentially derived from two axioms referred to as the 'luxury' and 'substitution' axioms, respectively. The luxury axiom states that

a family sends the children to the labour market only if the family's income from non-child labour sources drops below the subsistence level; and substitution axiom asserts that child labour and adult labour are substitutes from a firm's point of view (Dar et al. 2002).

Basu and Van (1998), in a multiple equilibria model, stress an alternative mechanism in which child labour is both a cause and a consequence of poverty: in a 'good' equilibrium, when market wages are high, parents choose not to send their children to work; whereas in a 'bad' equilibrium, when wages are low and families are poor, parents send their children into the labour force (Kruger et al. 2007). Dessy (2000) finds that there is a critical level of adult wages below which child labour is supplied. Ranjan (2001) also shows that credit constraints lead to inefficiently high levels of child labour, which, in turn, are related to greater income inequality.

Other models exploring multiple equilibria have looked at the relationship between child labour and social norms, and also at the question of income redistribution. The redistribution question is examined by Swinnerton and Rogers (1999), who stated that while the two crucial assumptions implied by Basu and Van's 'luxury' and 'substitution' axioms are related to the micro-behaviour of households and firms, in addition there also exists an essential assumption linked to the macro-behaviour. They describe a 'distribution axiom', which states that income and/or wealth from non-labour sources must be sufficiently concentrated within only a few agents to generate child labour. In particular, Swinnerton and Rogers demonstrate that with sufficient equality in the distribution of non-labour income, market equilibrium with child labour cannot exist in the Basu and Van model. This observation highlights the importance of inequality and/or bargaining power at the macro as well as the individual level as a potential important determinant of child labour (Dar et al. 2002).

Within the class of altruistic household model, Baland and Robinson (2000) have looked at dynamic consequences of child labour. They demonstrate various channels through which inefficiently high levels of child labour may persist in equilibrium, even when parents are altruistic. First, lack of access to credit markets may force parents to let their children engage in child labour to an extent that is Pareto inferior to what they would have chosen with sufficient access to credit. Second, since children cannot write credible and enforceable contracts for their parents to transfer resources to them in the future, this too may generate an inefficient level of child labour in equilibrium. Parents are unable to capture the full returns from their investment in children's education and therefore will under-invest, relative to what would otherwise be (Pareto) optimal.

Concept of social protection. Social protection is becoming a broader concept which goes beyond social policies and social welfare. According to Farrington and Slater (2006), social protection encompasses a sub-set of public actions that address risk, vulnerability and chronic poverty. Meanwhile, the World Bank describes a social protection programme with social risk management, and goes beyond the traditional area of social protection (labour market interventions, social insurance and social safety nets) to redefine its strategies to deal with risk (Holzmann and Jorgensen 2000). The three strategies of the World Bank's Social Risk Management are prevention, mitigation and coping, which can be provided via informal mechanisms (storing in the form wealth, trees, and transfer of cash within the household), market-based (insurance) and publicly mandated (such as social insurance, transferred payment of various kinds and public work). Canway and Norton (2002) argue that social protection includes the link between social assistance and wider economic objectives, such as growth, by assisting the poor so as to make them contribute towards growth, which closely resembles the World Bank's social risk management. The idea is to link social protection with the productive sector by making the market work better for the poor. As a result, provision of

credit and subsidised or free input are considered as components of social protection (Farrington, Slater and Holmes 2004). The UNICEF view of social protection focuses on vulnerable group such children and views social protection as a basic human right, in that the government are under obligation to provide both economic and social support to the most vulnerable segment of the population (Kamerman and Gabel 2006). The most inclusive definition is that developed by Devereux and Sabates-Wheeler (2004), which goes beyond raising income and reducing poverty. They state that social protection must enhance the social equity and social rights of poor, vulnerable and marginalised populations:

> Social protection is the set of all initiatives, both formal and informal that provide: social assistance to extremely poor individuals and households; social services to groups who need special care or would otherwise be denied access to basic services; social insurance to protect people against the risks and consequences of livelihood shocks; and social equity to protect people against social risks such as discrimination or abuse. (Devereux and Sabates-Wheeler 2004)

In general, there exists a broad range of social protection programmes. One form of social protection is s*ocial assistance* which involves non-contributory transfers to those deemed eligible by society on the basis of their vulnerability or poverty (Farrington and Slater 2006). It includes food transfers (food stamps, food rations, food price subsidies), cash transfers (grants, non-contributory pensions, family allowance programmes), service subsidies (social housing programmes, utility subsidies and childcare centres), and conditional cash transfers (conditional on child and maternal health care practices, school attendance, and nutritional standards, or on the use of welfare programmes). Social assistance may also include livelihood support payments targeted at households below the poverty line, which they are free to spend as they wish; 'cash for work'-type payments, i.e. made to those belonging to targeted categories who carry out public works under supervision; 'matching funds' which supplement the contributions that people themselves make to, for example, savings schemes, health and life insurance, and so on; and payments made as part of emergency relief, or to facilitate post-emergency transitions.

Another form of social protection is *social insurance* which involves individuals pooling resources by paying contributions to the state or a private provider so that, if they suffer a shock or a permanent change in their circumstances, they are able to receive financial support. Social insurance is, in general, more appropriate for better-off individuals, although it can have an important role in preventing them from dropping into poverty (Farrington and Slater 2006).

This paper follows the concept of social protection as defined by Devereux and Sabates-Wheeler (2004) because it is broader, inclusive of all providers of social protection (formal and informal) and all dimensions of poverty including all initiatives that helps protect the rights of children. Although social protection encompasses both public and private initiatives that addresses household vulnerability to shocks, what we consider in this paper is social assistance programmes provided by government and non-governmental organisations, namely safety net programmes (public work and cash/food aid) designed to help poor, vulnerable and drought stricken people and agricultural extension support programme designed for farmers to get subsidised inputs, credit and market information.

Social protection and its relation with child work and education. There is sufficient evidence that conditional cash transfer programmes help households to send their children school and to some extent reduce child labour (Tabatabai 2006; Rawlings 2005), while evidence on the effectiveness of unconditional cash transfers on child schooling is weak. Adapting a model

proposed by Hyslop (1999) that represents labour market participation decisions when there are search costs, de Janvry et al. (2006) develop a simple dynamic model of school enrolment decision under uncertainty, in which re-entry to school after a period of absence requires additional effort and cost on the part of the student. This model generates an enrolment decision that depends on the past enrolment state and current level of human capital. Using panel data for villages from the Mexican *Progresa* programme with randomised treatment, they have shown that shocks are highly prevalent, that many children have irregular periods of school enrolment, and that child labour is very frequent. They also showed that there is strong state dependence in the enrolment decision. In other words, children taken out of school are less likely to return subsequently, implying long-term consequences from short-term decisions.

From observing control villages incorporated in the treatment, de Janvry et al. (2006) note that children that who do not benefit from transfers during the experiment are harder to bring back to school, implying as well that short-term actions are difficult to reverse. Shocks have strong effects in taking children out of school. This applies to unemployment of the household head, illness of the household head and natural disasters in the community. In poor rural communities, children are indeed used as risk-coping instruments in response to these shocks. Strong state dependence implies that short-run consumption smoothing gains for the household result in long-term losses in human capital for children. The *Progresa* transfers, however, largely or completely compensate for these shocks. CCT thus have an important safety net role to play, protecting child education from a range of idiosyncratic and covariate shocks. Shocks also induce children to work, particularly girls and children of farm workers when their parents are affected by unemployment. *Progresa* transfers also fully shelter them from being sent to work. The conditionality on school attendance is thus effective in preventing use of their time as a risk-coping instrument.

Dubois et al. (2003) study the effects of a conditional transfer programme on school enrolment and performance using the Mexican social programme *Progresa*. They estimate empirically the different incentive effects and average treatment effects on enrolment and performance at school and find that *Progresa* always had a positive impact on school continuation whereas for performance it had a positive impact at primary school but negative at secondary school, due to the programme termination after the third year of secondary school.

Applying propensity score matching methods to household-level data from the 2000 Census of Brazil, Cardoso and Souza (2004) estimate the impact of income transfers on child labour and school attendance. They find that income transfer programmes have no significant effect on child labour, but do have a positive and significant impact on school attendance. This implies that the programmes are not effective in fighting child labour in Brazil because of the preference for combining school and labour, and that the transfers are considered too small to provide an incentive to forgo the labour income (Cardoso and Souza 2004).

Attanasio et al. (2006) studied the effects of a conditional cash transfer programme implemented in rural areas in Colombia in 2002 (*Familias en Acción*), on school enrolment and child labour. Using a quasi-experimental approach, their results show that the programme increased school participation of 14- to 17-year-old children quite substantially, by between 5 and 7 percentage points, and had lower, but not negligible, effects on the enrolment of younger children of between around 1.5 and 2.5 percentage points. In terms of work, the effects are generally largest for younger children, whose participation in domestic work decreased by around 10 to 12 percentage points after the programme but whose participation in income-generating work remained largely unaffected by the programme. The authors also

found evidence of school and work time not being fully substitutable, suggesting that some, but not all, of the increased time at school may be drawn from children's leisure time.

Schady and Araujo (2006) used a randomised study design to analyse the impact of the *Bono de Desarrollo Humano*, a cash transfer programme, on enrolment and child work among poor children in Ecuador. The objective was to determine whether or not programme effects are larger when transfers are 'conditioned' on certain behaviours, such as a requirement that households enrol their children in school. The authors found out that the cash transfer programme had a large, positive impact on school enrolment - about 10 percentage points - and a large, negative impact on child work - about 17 percentage points. The fact that some households believed that there was a school enrolment requirement attached to the transfers, even though such a requirement was never enforced or monitored in Ecuador, helps explain the magnitude of programme effects.

The study conducted by Edmonds (2006) found out that an anticipated large cash transfer to the elderly in South Africa appears to be associated with increases in schooling and declines in hours worked. The average rural South African child living with an elder who is not yet pension-eligible spends almost 3 hour per day working. In the data, pension income to an elder male is associated with over an hour less work per day. These declines in hours worked occur simultaneously with increases in school attendance. In turn, these declines in time spent working and increases in school attendance are also associated with increasing schooling attainment and primary school completion rates, especially for boys, in the length of time that the child has lived with a pension-eligible male. These changes in hours worked and schooling in relation to male pension eligibility lead to levels of work and schooling that are similar to what the data report for nearly-eligible elder women. Hence, the results herein would follow from a model where men are credit-constrained to a greater degree than are women. There is some suggestive evidence that these credit constraints influence schooling because of an inability to afford schooling.

Baland and Robinson (2000) show that if a family faces liquidity constraints, then child labour is inefficiently high (from the family's perspective), because child labour supply is determined by the marginal utility of consumption rather than the relative return to educational investments. The inability to borrow against future income forces households to under-invest in education. Therefore, receiving large cash transfers weaken this cash constraint, and hence children work less and attend school more.

Cash transfers may enable households to make previously unattainable investments in income generating activities. Gertler et al. (2004) used a controlled randomised experiment to identify the extent to which beneficiary households from Mexico's *OPORTUNIDADES* programme (an education, health and nutrition support programme), invested cash transfers and the extent to which those investments increased long-term household consumption. They found that transfers from the programme result in increased investments in micro-enterprises and agricultural production, which have a lasting effect on the household's ability to generate income and thereby increase living standards.

Yap, Sedlacek and Orazem (2002) evaluated the impact of a programme in Brazil known as the *Programmea de Erradicacao do Trabalho Infantil* (PETI) which was implemented in poor rural states of Northeast Brazil in 1996. The PETI provided income transfers to poor households in exchange for an agreement that the child would attend school at least 80 per cent of the time. In addition, the child had to attend an after-school programme that effectively doubled the length of the school day. The study used experimental approach on a cross-section of 3564 households with 6772 children between ages 7-14. It assessed the

impact PETI had on child schooling, labour supply, academic performance and hazardous work. The treatment group was composed of three municipalities which were in the PETI programme. The control group included three municipalities of like socioeconomic status that were not in the PETI programme. The study found that PETI increased time spent at school, reduced labour force participation and hazardous work, and increased academic success for children who had participated in the programme.

This review of literature reveals that while cash transfers conditional on children school attendance are effective in ensuring child schooling and reducing child work/labour, the evidence for the child welfare effect (schooling and labour) of unconditional assistance programmes such as public employment and food aid is not yet sufficiently available. Moreover, many of the studies that assessed the impact of conditional cash transfers on child welfare, especially on child labour, are conducted in Latin American and Caribbean countries where child labour is less extensive than in Africa (Tabatabai 2006). Therefore, this paper contributes towards filling the information gap on the relationship between child welfare (measured by education and work) and social assistance programmes that target households only.

3. Description of employment support programmes

The Food for Work programme in Ethiopia started in 1980 under the agenda of Rehabilitation and Development of Rural Lands and Infrastructure. The programme is divided into several phases. The first and the second were implanted from 1980 to 1994, while the third phase was conducted from 1995 to 1998 and the forth from 1999 to 2003. In 1997, similar programmes - namely the EGS -started as temporary employment schemes designed to combine relief efforts with development activities. EGS was considered as a direct contribution to the rebuilding of household assets, contributing to reduce Ethiopia's chronic food insecurity. This programme passed through three phases. The first phase (May 1997 to December 1998) was a pilot programme conducted in two drought-prone areas in Amhara Regional State, Belesa *Woreda* and Tigray Regional State, Saesi Tsaeda Emba *Woreda*. In this programme, part of the relief effort is given to conducting development activities in the area such as soil and water conservation, rural road building and other efforts that build community assets. Those who are not able to work are given free food aid, but those who are able to work are given 2.5 kg of grain per working day.[2] The second and third phases started in September 2001 and ran up until the launching of the PSNP in 2005.

Gratuitous relief (GR) distribution and General Free Food Distribution (GFFD) were other programmes (before PSNP) designed to support people who are not able to work, including pregnant, lactating mothers, disabled people and children. The principle was that GR distribution should not be given to those able to work in order to discourage dependency. If a person is able to work, he has to participate in EGS in order to get food aid. If, however, there are no available projects that can be undertaken through EGS and the area is affected by a sudden onset disaster, free food can be distributed to those able to work temporarily

2 The original plan was to provide 3 kg of grain per person, but because there is a shortage of relief resources, beneficiaries actually obtain 2.5 kg of grain per person.

until an EGS is implemented. This type of food aid is known as General Free Food Distribution (GFFD).[3]

Geographical and household level targets were used to select the beneficiaries of the above-mentioned PWPs (EGS and FFW). First geographical areas that are drought prone (sites) are selected. Then from each site, households are selected using vulnerability-ranking criteria, such as household assets and level of poverty. According to the National Food Aid Targeting Guidelines (DPPC 2000), the household level targeting criteria for FFW and EGS programmes were of two types, namely self-targeting and individual-targeting. Cash or in-kind payment below the market wage rate was made to participants in the programme. Everybody living in the village was able to join the programme providing there were sufficient resources. If there were not sufficient resources for all participants, individual level targeting was applied. The major individual criteria for inclusion in the EGS and FFW were ownership of productive (land, and livestock holding) and personal assets (such as jewellery and food stock), production failure, level of income from non-agricultural activities, family size and number of dependents.

After the severe droughts of 2002/03 (which brought extreme hunger upon almost one-quarter of the population), it became clear that a well-planned EGS with more resources was needed to make people's livelihoods more secure, in case disaster struck again. As a result of successive discussions between donors and government bodies, the PSNP was launched by the Ethiopian Government in 2005 and backed by donors including DFID, the World Bank, Ireland, Canada, Sweden and the USA. The PSNP has two components: the PWP and DSP. The PWP was planned to provide public works which are labour intensive community-based activities designed in order to provide employment for chronically food-insecure people who have 'able-bodied' labour. The programme pays daily wages for unskilled labour (either in cash or in kind) for the able-bodied, chronically food-insecure beneficiaries of the Safety Net. People get money and food in exchange for work which focuses on improving public facilities, such as roads, water points, and health and education posts. With the money received, those who are most susceptible to food shortages can buy assets that may turn into lasting sources of income. By providing enough food to meet participants' needs, the programme is expected to make households less likely to resort to desperate measures when famine threatens.

According to the revised PSNP programme implementation manual (FDRE 2006), a combination of administrative and community targeting is used to identify able-bodied food-insecure households who can participate in the programme. The Food Security Task Force established in each community is responsible for selecting the beneficiaries (households) of the programme. In principle, the task force pre-identifies beneficiaries (MoARD 2006: 23) who (1) are chronically food-insecure;[4] (2) who have suddenly become more food-insecure over the last 1 to 2 years as a result of a severe loss of assets and are unable to support themselves; and (3) who do not have any family support or other means of social protection or support. The task force has to further refine the selection by looking at (1) status of household assets such as land holding, quality of land and food stock; (2) income from non-

3 GFFD requires special authorisation whereby the district/*Woreda* Disaster and Preparedness Committee (WDPPC) raises the idea and RDPPC approves. The emergency operation was provided by WFP, EU and other non-governmental organisations, such as SCUK.

4 Defined as households which have faced continuous food shortages in the last 3 years and have received food assistance prior to the commencement of the PSNP programme.

agricultural activities and alternative employment; and (3) support/remittances from relatives or community. According to a baseline line survey of the Ethiopian food security programme (Gilligan et. al. 2007), the actual selection criteria used by communities is not fully consistent with the guidelines. For example, beneficiary selection criteria used in Tigray, Amahara, Oromia and SNNP in 2006 were based on poverty, ownership of a small area of land and small number of livestock holdings and poor health. In these regions, nearly 78 per cent of the communities put poverty in the top five eligibility criteria for public work. Contrary to the guideline, household food insecurity is used only by 7 per cent of the communities because (1) it was found difficult to judge the food insecurity of households and (2) poverty is considered a good proxy for food insecurity. Moreover, about 12-17 per cent of the communities used disability as a criteria for eligibility for public work in Tigray, Oromia and SNNP regions, while people with a disability should have been covered by DSP.

The PSNP programme also has a Direct Support (DSP) component which delivers assistance to households who are labour-poor and do not have reliable support. Specifically, the Direct Support component targets only two groups of individuals: the first group is individuals who (1) do not have labour to participate in public works; (2) do not have sufficient and reliable support from sons/daughters, or remittances from relatives away from the village; and (3) cannot participate or contribute to other community-based activities/initiatives, which includes disabled people. The second group includes individuals who do not have labour to participate in public works, but can participate or contribute in other community activities (e.g. managing day-care facilities). Such individuals include lactating mothers (in the first ten months after birth), pregnant women and orphaned teenagers. The actual main eligibility criteria used by the community for DSP in 2006 were age and disability in Tigray, Amhara, Oromia and SNNP (Gilligan et. al. 2007).

Basically, the PSNP and Food and Cash for Work are similar in nature in that beneficiaries have to provide labour in order to get support in cash or in kind. The only difference between the previous (EGS) and the current (PSNP) is in resource availability, institutional arrangement and planning. While EGS is based on the resources obtained from the annual emergency relief aid, PSNP is based on external resources provided on a multi-annual basis through the Safety Net Budget line of the government. This ensures availability of resources from the start of the year and allows public works to be undertaken at the most appropriate time. The capital input and administrative costs were very limited for EGS while, in the case of PSNP, districts are given appropriate budgets for capital inputs into public works and other supporting activities, which improve the quality of public work, assets created and, where appropriate, allow for more technically complex projects. In the Safety Net Programme, PWPs are overseen by the Food Security line offices and are designed in line with districts' development plans. On the other hand, there was no clear institutional responsibility to plan and follow up EGS activities. Therefore, we expect PSNP to be more effective than EGS in protecting households from shocks and falling into poverty as it has more resources, better planning and an institutional setup for implementation and monitoring.

All Young Lives sample sites are located within the food security *districts* and hence all our sites are beneficiaries of PSNP, EGS or GFFD. The PSNP started in 2005. Our Young Lives survey captured involvement of households in the PSNP and the amount of income beneficiary households obtained in the 12 months prior to the survey. Since we have asked households about their involvement in Food and Cash for Work as well as other support programmes since 2002 via our programme support module, we were able to assess not only the impact of the PSNP, but also the other programmes that existed under the EGSs and agricultural extension programme.

In addition to the PSNP and EGS, farmers in rural areas receive agricultural extension support programmes which enable farmers to obtain technical advice on the use of modern cultural practices (such as ploughing, drainage, weeding and harvesting); access better marketing information and outlets; purchase capital inputs (such as fertiliser and improved seeds); and to use credit to purchase farm inputs and livestock for animal husbandry. The agricultural extension support programme has been in place since the Imperial Era, and went through successive reforms during the *Derg* and post *Derg* Regime. In 1995/6, the Participatory Demonstration and Training Extension System (PADETES) started to remedy the drawback of the previous systems. According to the review made by Kassa (2008), the stated objectives of the this new agricultural extension system are increasing the supply of food, industrial crops (i.e., those which can be used as raw materials for manufacturing such as cotton, and oil) and export crops, improving productivity and income, ensuring rehabilitation and conservation of natural resources base, and empowering farmers. To achieve these objectives the extension system used a package approach including distribution of farm input to farmers on credit. In short, the main three elements of PADETES are providing package of technologies, complementing the delivery of the packages by credit, and sufficient communication between actors in the extension system to ensure participation of beneficiaries.

Although initially the programme focused on food crops, it later implemented a package of technologies for high value crops (oil crops and vegetables), livestock (dairy poultry, beekeeping and fattening) and natural resources (forestry, and soil and water conservation). As a result, credit availability improved, as did distribution of fertiliser, and improved varieties of crops and livestock were developed (Kassa 2008). Recently, the extension system was linked to food security in certain regions (for example, in Amhara and Tigray regions) in order to provide subsidised credit via microfinance for the purchase of farm inputs such as fertiliser, improved seeds and oxen and other farming activities such as fattening, bee keeping, and water pumps (Borchgrevink et al. 2005).

All farmers are free to take part in this programme. Even farmers who do not own land may participate in livestock programmes such as fattening, beekeeping and poultry. The main occupation of the Young Lives sample households in rural areas is farming, and hence all sample households are free to be beneficiaries of the agricultural extension support programme.

4. Theoretical framework, method of estimating impact and data set description

4.1. Theoretical framework

Households' participation in EGS may affect the time children spend on working, schooling and study as a result of substitution and income effects. Employment generation programmes may reduce or increase child work (and the time children spent on schooling and study) depending on whether substitution effect dominates the income effect. The relative strength of substitution and income effects depends on the preference of households (indifference curve) for other good and schooling given their budget constraints; the opportunity cost of children and other household members' time; and substitutability of adult labour by child labour or vice versa. If substitution effect dominates the income effect, involvement in EGS will increase child work and reduce schooling (including study time). If the income effect is large enough to be dominated by the substitution effect, EGS will reduce child work and increase the time for schooling and study.

To see how the income and substitution effects of EGS operates, let us consider Figure 1 and Figure 2, with the vertical axis representing the quantity of other goods (denoted by *X*) available for consumption in the household and the horizontal axis representing time spent on schooling, study and leisure (S). Assume that *M* is the total amount of budget available to the household for spending on *X* and *S* given by

$$P_x X + P_s S = M$$

where P_x is the price of other goods and P_s is the cost of children's time, including direct cost of schooling, and P_s/P_x the slope of the line. The total time available to children is line OT which can be used for working (*W*) and schooling, study and leisure (S). Child work is measured by *T-S*. Line *NN*' is the original budget line given by

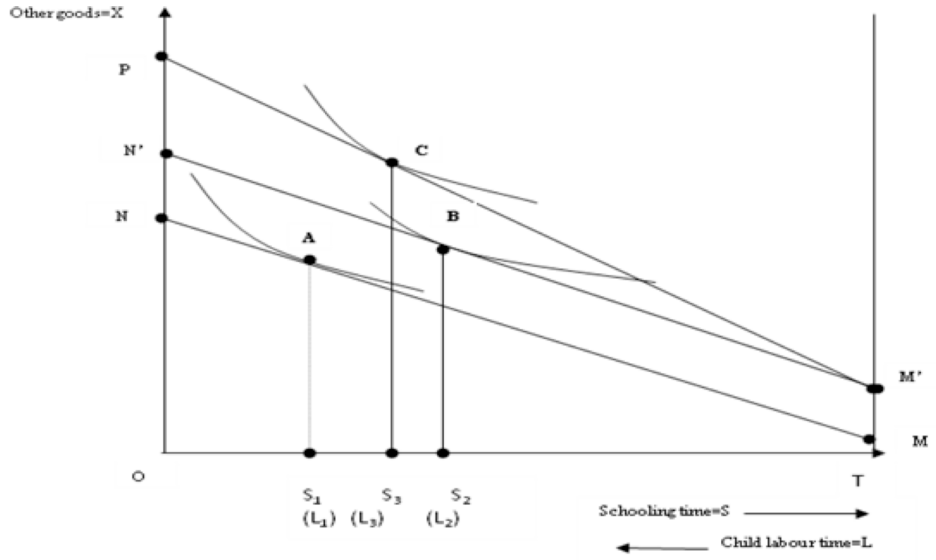
$$XS = \frac{M}{P_X} - \frac{P_s}{P_X}$$

At a point where S=T, the child devotes his full time to schooling (including studying at home). When a child spends his time both working and schooling, the household faces a budget line with a negative slope representing children's wage which equals P_s/P_x indicating a trade-off between consumption of other goods and schooling (or work). The initial optimal allocation of children's time between work and schooling will be determined by the tangency of the indifference curve and budget line, that is, at point A, where OS_1 units of time are allocated to schooling and studying and TL_1 units of time are allocated to work.

To demonstrate a case where income effect dominates the substitution effect, let us consider Figure 1. Initially the household is at point A, where the indifference curve is tangent to the budget line. When a household participates in EGS, the budget available to the household increases from M to M'. Assuming the opportunity cost of time does not change, the equilibrium point moves from point A to point B, where child work declines from TL_1 to TL_2.and schooling time increases from OL_1 to OL_2 due to income effect. However, the

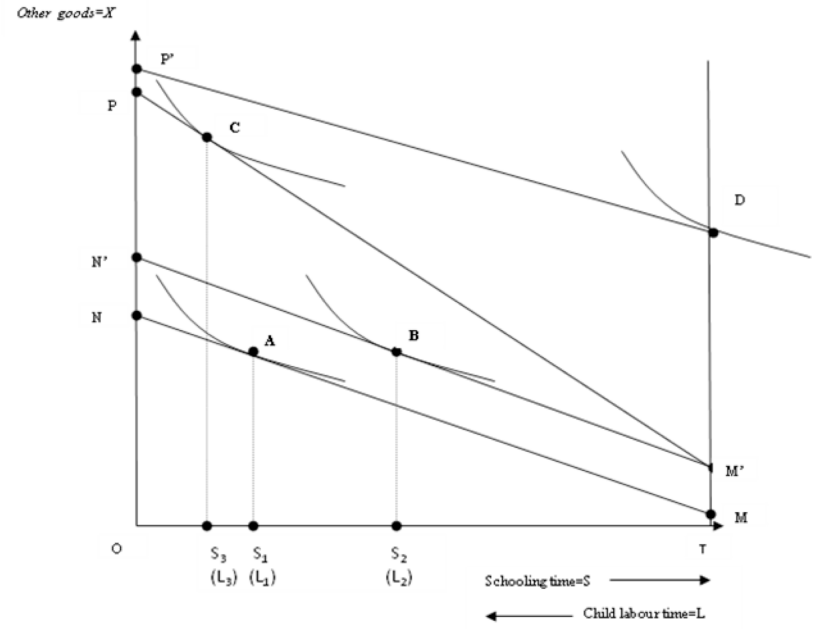
household faces a steeper budget line (line M'P), indicating an increase in the opportunity cost of using child time for schooling. As a result, the final optimal allocation of a child's time is at point C, where child work increases to TL_3 and schooling time decreases to OS_1 due to substitution effect. Since the income effect dominates the substitution effect, child work declines from TL_1 to TL_3 and schooling time increases from OS_1 to OS_2.

Figure 1. *Effects of EGS on child work and schooling time (income effect dominates substitution effect)*



Another scenario is a case where substitution effect dominates income effect (Figure 2). Assuming the household budget constraint before participation in EGS is line *MN*, the initial equilibrium will be at point A, where the indifference curve is tangent to the budget line. When a household is involved in EGS, the household's budget constraint tilts upward and the new budget constraint is line *PP'*. Following the same argument as above, due to income effect, child work declines from OL_1 to OL_2, and schooling increases from OS_1 to OS_2. Due to the substitution effect, child work increases from OL_2 to OL_3, and schooling time declines from OS_2 to OS_3. Since the substitution effect dominates the income effect, the net effect is that child work increases from OL_1 to OL_3, and schooling time declines from OS_1 to OS_3 at the final optimal point, C.

Figure 2. *Effect of employment generation programmes on child work and schooling time (substitution effect outweighs income effect) Point D shows the level of transfer required for households to voluntarily allocate child's full time to schooling and studying.*



4.2. Estimating the impact of EGS on child work and schooling and study time

One possible way to measure the impact of safety nets on child welfare is to compare child welfare outcome (measured by child work) between those households which participate in EGS and those which do not. Let $\boldsymbol{y_1}$ denote the child labour outcome with treatment and $\boldsymbol{y_0}$ the child labour outcome without treatment. Let the variable $\boldsymbol{w}$ be a binary treatment (participation in safety net programmes) indicator where w=1 denotes participation in the programmes and w=0 denotes non-participation.

Let us assume that treatment w, is independent of the outcomes (y_0 and y_1) after conditioning with x: $y_1, y_0 \perp w \mid x$. We can also deal with the weaker version of conditional independence of participation and y_0: $y_0 \perp D \mid x$. This assumption is called ignorability assumption (Rubin 1978; Wooldridge 2001).

Assuming that $E(y \mid x, w)$ is linear, the outcome-participation equation is given by

$$y = x'\beta + \alpha w + u, \qquad (4.1)$$

where $E[u \mid w] = E[y - x'\beta - \alpha w \mid w] = 0$. In this case w is treated as exogenous. In order to identify some population measure of impact, overlap or matching assumption is required. Matching assumption is stated as

$$0 < \Pr[w = 1 \mid x] < 1) \qquad (4.2)$$

This assumption ensures that for each treated individual, there is another matched untreated individual with a similar x. When treatment participation depends stochastically on a vector of observables x, the concept of propensity score is useful. Propensity score is a conditional probability measure of treatment participation given x, denoted as

$$p(x) = \Pr[w = 1 \mid X = x] \quad (4.3)$$

Another condition that plays an important role in treatment evaluation is the balancing condition which states that $w \perp x \mid p(x)$. This means that for individuals with the same propensity score, the assignment of treatment is random and should look identical in terms of *x* vector. This balancing condition is a testable hypothesis. Conditional mean independent assumption states that

$$E(y_0 \mid w = 1, x) = E(y_0 \mid w = 0, x) = E(y_0 \mid x).$$

This implies that y_0 does not determine participation. According to Rosenbaum and Rubin (1983), the conditional independent assumption given *x* implies conditional independent assumption given p(x). That is

$$y_1, y_0 \perp w \mid x \Rightarrow y_1, y_0 \perp w \mid p(x).$$

Often *p(x)* is a particular function of *x* and is computed given the data (w_i,x_i) by logit or probit regression.

From the assumptions above, the outcome-participation equation can be written as

$$y = x\beta + \alpha p(x) + u = x'\beta + \alpha p(x) + [u + \alpha(p(x) - p(x))] \quad (4.4)$$

Since the unknown *p(x)* is replaced by a sample estimate, the error term, $u + \alpha(p(x) - p(x))$, includes additional sampling error, $\alpha(p(x) - p(x))$.

Selection bias can arise when the treatment is correlated with the error term in the outcome equation. Selection bias can arise due to two reasons: selection on observables and selection on unobservables. Selection on observables arises when there are incorrectly omitted variables that partly determine *w* and *y.* In this case, the error term will be correlated with the participation variable, *w*. This can be easily corrected by including all relevant variables in the outcome equation. The second source of selection (selection on unobservables) arises when there are unobservable factors that partly determine both *w* and *y*, which makes the error term in the outcome equation to be correlated with the participation variable, *w*. In this case we have to deal with endogenous treatment effect or use IV estimation method.

4.3. Description of data

This paper uses Young Lives survey data from the older cohort, using a time-use module for the index children (12 years old). Specifically we used information collected using section 1A (page 3) and 1B (page 13) of the 'Child Questionnaire' of the older cohort. The outcome variables are hours spent on various activities in a typical day and the highest grade completed by the children. The activities include paid work outside home, unpaid work outside home, child care and household chores, schooling and studying at home. For the economic shock variables, we use data obtained via question 6.3 (question 6.3.5). Information regarding households' involvement in social assistance programmes is obtained from question 3.17 of the household questionnaire, while information regarding household income from (and also involvement in) PSNP (PWP and DSP) is obtained from the income module (Section 3D, p. 39 and Section 3E, p. 43, respectively).

Location and gender. The total number of observations used in this paper is of 980 households, of which 584 (60 per cent) reside in rural areas while 396 (40 per cent) are urban dwellers. Overall, 51 per cent of the children are boys while the remaining 49 are girls. The average age of household heads (76 per cent of whom are male) is 43, with a range of 15 to 85 years of age. The average mothers' education level is grade two during both rounds

of the survey, while that of fathers is grade two in the first round and grade four during the second round (see Table A4.1 in the appendix).

Household composition. The descriptive statistics in Tables A4.1 document a wide range of household compositions that include the number of household members disaggregated by age and sex, the birth order of index children, and the number of economically-dependent household members. The Young Lives older cohort sample children are on average the fourth children of their families, having an average of three older siblings. Each household also has at least 1.2 economically dependent members, with some households having up to five. An average household has a fairly similar number of male and female members (1.2 and 1.3 respectively, on average) whose age range qualifies them for the labour force (17 to 65).

Household wealth. Household wealth measured by wealth and asset indices increased substantially between 2002 and 2006: the wealth index grew by 31 per cent and the asset index by 17 per cent (Table 4.5). In both rounds the wealth index is higher in urban areas than in rural areas, while the asset index is higher in rural areas than in urban areas. This is partly because the wealth index better measures urban wealth while the asset index is better suited to measuring rural wealth, since the asset index is composed of farm-related assets while the wealth index is mainly composed of household durables and access to services. As a result, the rural wealth index starting from a lower value has higher growth, while the urban asset index starting from a very low base registered higher growth.

Shocks. In terms of shocks, 46 per cent of the households have suffered from either illness or death of a household member during the last four years (Table 4.6). Another 14 per cent have encountered theft. 30 per cent were affected by increased input prices, while 32 per cent were hurt by reduced output prices during the same period. Death of livestock (26 per cent), drought, crop failure or pests (48 per cent), and natural disaster (43 per cent) are also some of the major shocks having adverse impacts on households. The most common type of shock suffered by rural households is drought, crop failure and pests, which affects 72 per cent of households. This is followed by natural disasters (65 per cent), death or illness of household members (46 per cent) and adverse prices (40 per cent). In urban areas, on the other hand, it is death or illness of a household member that affects most of the survey subjects (46 per cent), followed by adverse prices and loss of jobs or shutdown of places of employment, with each shock affecting close to 20 per cent of the total households.

Support programmes. From the information we obtained from the support programme module, we compared the distribution of support programmes provided since 2002 by location. We found out that those in rural areas benefit more from support than those in urban areas. Ninety-nine per cent of agricultural extension support, 85 per cent of Cash for Work and 90 per cent of Food for Work were provided to rural areas. Similarly, 83 per cent of health extension services, 77 per cent of credit support and 61 per cent of family planning services are rendered to rural households. Water well development support, cash/food aid (unconditional transfers) and irrigation development support, although small, are all biased towards rural areas. On the other hand, 97 per cent of education support and 88 per cent of support programmes for the prevention of mother to child HIV/AIDS transmission were offered to urban areas.

The perceived impact of participation in support programmes since 2002 on the well-being of their children was assessed in the survey (Tables 4.9 to 4.11). Beneficiaries perceived that agricultural support allowed households to have more food of a better quality at their disposal, thereby benefiting children. Conditional transfers (both Cash for Work and Food for Work and credit support) were perceived as instrumental to having better quality food as well

as more food. Educational support programmes were considered to facilitate more resources for educational purposes.

Information on households' participation in PSNP comes from the income module of the household questionnaire. While PSNP started in 2005, how much income each household obtained over the last 12 months from PSNP was recorded in the income module of the survey data collected in the last quarter of 2006. PWP is one of the components of PSNP that is specifically designed for rural areas.[5] About 46 per cent of the sample households in rural areas were involved in PWP (see Table 4.7 above). The average income a rural household obtained from the public work was found to be 368 Birr (£41.72) per year. When we consider the participants of PWP only, the average income a rural household obtained from PWP was about 795 Birr (£90.14) per year, which about 11 per cent of the total consumption expenditure.

The second component of PSNP is the DSP, which provides cash/food handouts to households who cannot supply labour. In our sample about 24 per cent of the sample households (with 33 per cent from urban areas and 19 per cent from rural areas) received cash/food aid support for 12 months. The average income per household from the cash/food handout was 147 Birr (£16.67) per year. In urban areas, the average income from cash/food aid was 130 Birr, while it was 158 Birr for rural households. When considering the cash/food aid recipients only, the average income from direct support is 848 Birr per year, which is about 11 per cent of the total household consumption expenditure. In rural areas, the income households obtained from cash/food aid programme is slightly higher than the income obtained from PWP. In our survey data, about 18 per cent of the households are also involved in the agricultural extension programme.

Child schooling and work. The enrolment and average grade completed by the 12-year-old children is presented in Tables 4.1 and 4.2. About 95 per cent of the children are enrolled in school and the mean highest grade completed by the children is grade four, with urban figures (4.9) slightly higher than rural (3.4). The school enrolment rate of the index children during Round 1 of the survey was 66 per cent; this increased to 95 per cent by Round 2. Disaggregating by rural/urban categories, the rural enrolment rate was 55 per cent and grew to 93 per cent in Round 2; while the enrolment rate in urban areas grew from 83 per cent in Round 1 to 96 per cent in Round 2. Looking at enrolment by gender indicates that girls have a slightly higher enrolment rate than boys, the mean grade in Round 2 being slightly higher for females in rural areas. In general, boys showed a lower enrolment rate and fewer average years of schooling than girls.

The dropout rate of children from school between Round 1 and Round 2 surveys was very low: about 3 per cent for rural and 2 per cent for urban children (Table A4.2). The index children were asked during Round 2 if they have missed class for whole week over the last 12 months. Only 14.3 per cent responded yes, with the urban figure (14.7 per cent) slightly higher than the rural (13.8 per cent). Missing classes for a whole week mainly occurred from October to January, when agricultural work (such as harvesting) is very intensive and children have to go to school (see Tables A4.2 and A4.3 in the Appendix). The main reasons for missing classes were that children had to do paid work (58 per cent) or were required for

5 Although PSNP is designed officially for rural areas only, about 63 per cent of the household in one of our urban site (Fereweini, Senkata Town, Tigray) were found to be beneficiary of PWP component of the PSNP. No meaningful participation in PWP is reported in all other urban sites.

domestic or agricultural work (18 per cent) (see Table A4.4). In urban areas, 74 per cent of children missed school for a whole week due the need to work for pay.

Only a very small proportion of the 12-year-old children (9.6 per cent) responded that they did not have enough time to study, with a slightly higher figure for rural areas (11 per cent). The main reasons given for this was that they were responsible for too many chores (49.4 per cent overall and 53 per cent for rural areas) and lack of adequate lighting (15.2 per cent with 17.3 per cent for rural children). In order to allow more time for studying, children wish to reduce their work load (61.5 per cent with 63 per cent for rural children), have adequate lighting (24.4 per cent with 27.5 per cent for rural children) and allow study time at school (12.8 per cent with 10 per cent for rural children). However, a large proportion of children (about 20 per cent overall, and 17 per cent for rural children) responded that their home environment is not a convenient place to study. Of these, 73 per cent (12 per cent for rural children) have enough time. Hence for urban areas, it is not workload only that prohibits children, but inconvenient home environment. For rural areas, heavy work load and lack of proper lighting are the main reasons for not having enough time to study.

The amount of time and participation rate of children in different activities are summarised in Tables 4.1 and 4.2. The number of hours children spend doing domestic chores (including child care) and paid and unpaid work outside the home amount to an average of 4.5 hours engaged in work activities during a typical day. The rural figures (5.2 hours) are higher than the urban figures (3.3 hours). The average time students need to travel to get to their respective schools is around half an hour (23 minutes for urban dwellers and almost 36 minutes for rural students).

Table 4.1. *Time spent working on various activities in hours in a typical day in the previous week by children of 12 years old*

Type of child outcome variables	Rural	Urban	Girls	Boys	Total
Highest grade completed	3.44	4.86	4.10	3.92	4.01
Hours index child spent on child care	0.62	0.60	0.77	0.46	0.61
Hours index child spent on domestic work	2.28	2.16	2.83	1.66	2.23
Hours index child spent on unpaid work outside home	2.33	0.57	1.03	2.18	1.62
Hours index child spent on paid work outside home	2.17	0.42	0.90	2.01	1.47
Hours index child worked outside home, paid and unpaid	0.16	0.15	0.13	0.17	0.15
Hours child spent on child care and domestic activities	2.90	2.76	3.59	2.12	2.84
Total hours index child spent all types of work	5.23	3.33	4.63	4.31	4.46
Total hours child spent on schooling	5.12	5.87	5.49	5.36	5.42
Total hours child spent on studying at home	1.59	1.94	1.71	1.75	1.73

Table 4.2. *Participation rate (%) of children (12 years old) in various activities in a typical day in the previous week*

Participation (%)	Rural			Urban			All
	Girls	*Boys*	*Total*	*Girls*	*Boys*	*Total*	*Total*
Enrolment in school	94.3	91.4	92.8	98.0	97.0	97.5	94.7
Child care	44.5	29.6	36.8	39.1	29.1	34.1	35.7
Domestic work	96.1	76.7	86.1	94.4	83.4	88.9	87.2
Unpaid work outside home	47.3	81.7	65.1	9.6	21.1	15.4	45.0
Paid work outside home	4.9	5.6	5.3	2.0	4.5	3.3	4.5
Child work outside home paid and unpaid	50.2	83.7	67.5	11.7	23.6	17.7	47.3
Child care and domestic activities	96.5	80.4	88.2	95.9	87.9	91.9	89.7
All types of activities	100.0	99.7	99.8	97.0	91.5	94.2	97.6

Table 4.3. *Enrolment rate of index children (12 years old) by gender*

Sex of child	Rural		Urban		Total	
	Round 1	*Round 2*	*Round 1*	*Round 2*	*Round 1*	*Round 2*
Girls	54.1	94.3	82.7	98.0	65.8	95.8
Boys	56.1	91.4	82.4	97.0	66.6	93.6
Total	55.1	92.8	82.6	97.5	66.2	94.7

Table 4.4. *Average grade completed of 12-year-old children in Round 1 (R1) and Round 2 (R2)*

Sex of child	Rural		Urban		Total		Change between rounds		
	R1	*R2*	*R1*	*R2*	*R1*	*R2*	*Rural*	*Urban*	*Total*
Girls	0.5	3.6	0.9	4.9	0.7	4.1	3.1	4.0	3.4
Boys	0.5	3.3	0.9	4.9	0.6	3.9	2.8	4.0	3.3
Total	0.5	3.4	0.9	4.9	0.6	4.0	2.9	4.0	3.4

Table 4.5. *Level of wealth and asset indices and change in indices between Round 1 and Round 2*

	Urban	Rural	Total
Round 2 wealth index	0.379	0.137	0.235
Round 1 wealth index	0.319	0.084	0.179
Change in wealth index (%)	0.187	0.635	0.312
Round 2 asset index	0.161	0.280	0.232
Round 1 asset index	0.129	0.245	0.198
Change in asset index (%)	0.255	0.141	0.171

Table 4.6. *Percentage of households affected by various shocks in the last 4 years: older cohort*

Type of shock	Urban	Rural	Total
Dummy for illness of household members	35.10	37.16	36.33
Dummy for death or illness of household members	46.46	45.89	46.12
Dummy for theft	13.13	13.87	13.57
Dummy for increase in input price	19.19	37.67	30.20
Dummy for decrease in output price	20.45	39.90	32.04
Dummy for death of livestock dummy	8.08	37.67	25.71
Dummy for place of employment shutdown or job loss	17.93	5.31	10.41
Dummy for drought	6.57	46.92	30.61
Dummy for drought, crop failure and pests and diseases	12.37	72.26	48.06
Dummy for divorce or separation of family	3.03	1.71	2.24
Dummy for any dispute	3.79	5.31	4.69
Dummy for confiscation of asset and abandoned credit sources	1.77	2.40	2.14
Dummy for having to pay for school	10.10	9.59	9.80
Dummy for new HH member or birth	8.84	21.23	16.22
Dummy for migration	0.51	0.34	0.41
Dummy for natural disaster and drought combined	10.35	65.07	42.96

Table 4.7 *Involvement in and income (Birr per year) from PSNP: Public work and direct support in the last 12 months from the survey time*

	Rural	Urban	Total
% participating in PSNP: pubic work programme	46.2	9.1	31.2
% received direct support from PSNP	18.7	32.8	24.4
Mean income from public work, PSNP	367.76	48.30	238.67
Mean income direct support , PSNP	158.34	130.35	147.03

Table 4.8. *Percentage of households who have had support from various programmes since 2002: older cohort*

Support type	Variable name	Urban	Rural	Total
Agricultural extension	agextr2	0.3	17.8	10.7
Cash for Work	cfwr2	5.1	13.4	10.0
Food for Work	ffwr2	3.5	14.6	10.1
Cash and Food for Work combined	cffwr2	8.6	27.9	20.1
Credit support	creditr2	6.6	9.9	8.6
Support from health extension agent	hlthextr2	0.5	2.9	1.9
Health support	hlthr2	2.0	2.9	2.6
Education support	edur2	14.4	0.2	5.9
Food aid	faidr2	7.8	11.3	9.9

Table 4.9. *Perceived benefits YL child obtains from the programmes (%) in rural areas*

	Agricultural extension	Cash for Work	Food for Work	Credit	Food aid
Better quality food	26.85	21.64	49.51	27.56	44.03
More food	55.7	61.99	46.6	51.24	46.27
More resources for educational purposes	4.7	9.36	1.46	8.83	3.73
More time to study	-	-	-	0.35	-
Less time on work activities	2.68	1.17	0.49	1.06	1.49
Less time on household chores		1.75			1.49
Other	0.67	1.17	0.49	6.01	

Table 4.10: *Perceived benefits YL child obtains from the programmes (%) in urban areas*

	Food aid	Education support
Better quality food	30	4.29
More food	52.5	8.57
More advice on caring practices	0	0
More resources for educational purposes	12.5	81.43
More health care treatment	0	1.43
More time to study	0	0
Less time on work activities	0	0
Less time on household chores	5	2.86
Other	0	1.43

5. Estimation results and discussions

Following Wooldridge (2001) and Cameron and Trivedi (2005), we implemented an exercise estimating the impact of support programmes on children's allocation of time to work and schooling/studying. First we estimated a logit model of propensity score (i.e. logit model of *w* on a set of *x* variables). The *x* variables chosen were Round 1 household composition, wealth index and asset index, dummy variables for a household affected by crop failure, death of cattle, death and illness of family members within the 5 years prior to the survey, as well as the square and interaction of the variables. These variables are consistent with the selection criteria used by the communities to select beneficiaries of EGS and PSNP programmes (see section 3 of the paper). We used the Ramsey Reset test to see if there were any omitted variables in the model and found no omitted variable bias. We use stata '*psmatch2'* command (Leuven and Sianesi 2003) and kernel smoothing to match treatment and comparison observations and to estimate the treatment effect on the treated group. Standard errors are computed using the bootstrap method. Unlike nearest neighbourhood matching, using the bootstrap method to estimate standard errors after kernel matching gives valid estimators (Gilligan and Hoddinott 2007).

We used different specifications of logit models to estimate propensity scores (Dehejia and Wahba 1999, 2002) in order to ensure balancing condition. When we got many unbalanced strata (after testing the balancing property), the logit model was re-estimated with an

improved specification that included interactions and higher order terms among the regressors, *x*.

Since the AEP and Cash/Food for Work for both PWP and EGS are specifically designed for rural areas, we limited the sample to rural areas when we assessed the impact of PWP, EGS and AEP. The impact of food aid was estimated for both rural and urban areas. In urban areas, we found many of the cash/food handouts are provided not only as food aid, but also as education support.

5.1 Propensity score matching regression

The logit model of propensity score was estimated for three kinds of programme: (1) rural PWP, such as Cash and Food for Work support programmes; (2) the agricultural extension support programme in rural areas; and (3) DSP, including cash and food handouts as aid and education support for both rural and urban areas. Since the first two support programmes have differences between rural and urban areas, we ran separate logistic regression (propensity score) for rural and urban areas. Public work (Cash/Food for Work) and agricultural extension support programmes (AEP) are observed only in rural areas and are not captured in urban areas in our survey data. The DSP component of the PSNP (cash/food and education support) has been implemented in both rural and urban areas. Therefore, for rural areas, we estimated the impact of public work and agricultural extension programmes on hours spent by children on various activities and education, while we estimated the impact of direct support (cash/food aid and education support programmes) for both rural and urban areas.

The results of the first stage regression and descriptive statistics of the variables used for the three programmes are provided in Tables A5.1 to A5.5. As there are no guidelines on how to choose conditioning variables, *x* (Smith and Todd 2005), we selected *x* variables that affect both the outcome and the participation in programmes intuitively. We mainly used initial conditions (household composition, human capital and physical wealth) and shocks observed before the first round survey and shocks observed between the first and second round survey period. We also included site dummies in the set of conditioning variables, which we found very helpful in meeting the balancing property. Standard errors were computed using the bootstrap method.

Although the model used to estimate propensity score need not be perfectly accurate for estimating a program impact (Cameroon and Trivedi 2005), it might be good to revaluate the models of the propensity score or first stage regressions. The propensity score models fit quite well. The Pseudo R^2 is 36.5 per cent for PWP in rural areas (Table A5.1) and 22 per cent for DSP (cash/food aid and education support) in rural and urban areas combined (Table A5.3). The Pseudo R^2 for logistic regression of participation in the agricultural extension programme in rural areas is 40.6 per cent (Table A5.2). Balancing conditions for all three propensity score models was obtained. In total we have 955 observations, with 352 from urban areas and 584 from rural areas. We also estimated the treatment effect for boys and girls separately for all the support programmes considered above.

5.2 Treatment effect of support programmes in rural and urban areas

We analysed treatment of the support programmes on the highest grade completed and hours per day children spent on various activities including work, schooling and studying at home. The types of child work and other activities we considered were (1) paid and unpaid work outside home; (2) unpaid work outside home; (3) paid work outside home; (4) child care

and domestic work; (5) all types of work including paid and unpaid, as well as at home and outside home; (6) schooling; and (7) studying at home. We analysed the treatment effect separately for rural and urban areas as well as for boys and girls.

PWP (a component of PSNP) in rural areas. As pointed out above, the PWP in Ethiopia requires households to supply labour in return for a daily unskilled wage. Hence, PWP has both substitution and income effects on children's time use for various activities - namely paid and unpaid work, schooling and studying at home, as well as on the highest grade completed. Depending on the net effect of the substitution and income effects, PWP may increase or decrease children's time spent on work, schooling and study, and grade completed. The treatment effect estimated provides the net effects.

The treatment effects of PWP on the schooling, work and other activities of rural children are provided in Table 5.1a. We found that PWP has a positive effect on paid work and paid and unpaid work combined, and a negative effect on childcare and household chores and total work. However, the treatment effect is statistically significant for the hours spent on paid work (which is positive) and childcare and household chores (which is negative). On the other hand, PWP has a positive effect on the time children spend on schooling, studying and on the highest grade completed, although these effects are not statistically significant. Consequently, we found that PWP increases paid work outside the home by 0.13 hours per day and reduces child care and household chores by 0.57 hours per day, implying that the income effect dominates the substitution effect for child care and household chores, and that substitution effect dominates the income effect for paid work. The increase in paid work outside the home could be due to the direct involvement of children in public work, or the substitution of child for adults when adults go into public work. Although further investigation is required, our qualitative assessment in 2008 indicated that children are involved to some extent in paid work around their community and in PWPs, despite the regulation that officially stipulates that boys are not allowed to participate in PWP.

When we analysed the effect of PWP by gender, for girls we found a statistically significant effect of PWP on paid work outside the home, childcare and household chores, studying at home only for girls. The effect is positive for paid work (0.25 hours more per day), negative for child care and household chores (0.50 hours less per day) and positive for studying time, with a net effect of reducing child work and increasing studying time as a whole. For boys, a positive and statistically significant effect was found only for childcare and household chores (0.57 hours less per day). No significant effect on grade completed was found for either girls or boys.

There were 75 observations/households which participated in both the PWP and agricultural extension programmes. To check the sensitivity of the result, we estimated the impact of PWP on all households excluding these 75. There was no change in the estimated impact of PWP on girls' use of time for work or schooling. However, the effect of PWP on child care and household chores for boys turned out to be insignificant.

We also estimated the impact of the EGS that existed before 2005 (Table 5.1b). As with PWP, we found the impact of EGS on girls' and boys' use of time on paid work and girls' use of time on studying are positive. However, unlike PWP (PSNP), the impact of EGS on boys' and girls' hours of work per day on child care and household chores is not statistical significant. Moreover, the positive impact of EGS on child work for pay (0.26 hours per day) is twice that of the PWP of the PSNP (0.13 hours per day). These results imply that in terms of the child welfare outcome, the PWP of the PSNP is much better than that of its predecessor, EGS.

Agricultural Extension Programme (AEP) in rural areas. Many farmers are part of the agricultural extension support programme, through which they are encouraged to adopt labour- and land-augmenting technologies like fertiliser, improved seeds and new cultural practices. In our survey data, about 18 per cent of households are involved in the agricultural extension programme. The programme may have both substitution and income effects with regard to the use of children's time for work and education. What we found is that the income effect is large enough to be dominated by the substitution effect and the net effect of agricultural extension support programmes is negative for child work and positive for schooling and study time. This is stronger than the effect of PWP on child work and schooling and study time. Among the activities, statistically significant negative impacts are found on time spent on paid work and total work (Table 5.2). The impact of the agricultural extension support programme is -0.50 hours for total work and -0.23 hours for paid work in a typical day. However, we could find no statistically significant effect on unpaid work in terms of farm work and cattle herding. This might be due to the fact that working on the farm and herding cattle are traditionally the duties of children. Regarding education, we found a positive and statistically significant effect on schooling and studying time. Although not statistically significant at 10 per cent, the effect on grades completed by children is positive and statistically significant at the 15 per cent level.

When disaggregated by gender, we obtained a slightly different result in favour of girls. While the result remains the same for boys, for girls we found the agricultural extension programme significantly reduces girls' time spent on paid work, childcare and household chores and total work. The agricultural extension programme has a positive and statistically significant effect on hours per day which girls spend on studying (0.92 more hours per day) and on girls' highest grade completed (0.53 years more), implying that AEP is more favourable for girls than boys. The difference in the magnitude of the effect on child work between girls and boys is also remarkable. While the effect of AEP on paid work, childcare and household chores, and total work for girls are -0.26, -0.42, and -0.61 hours per day respectively, for boys these figures are -0.22, -0.61, and -0.32 hours per day. Moreover, the effect on studying time is an increase of 0.93 hours (55 minutes) per day, whilst the highest grade completed is increased by 0.53 year.

To sum up, the income effect dominates the substitution effect for AEP. The main reasons the agricultural extension programme performs better than PWP in terms of child welfare is that the return from the agricultural support programme is very high and farmers can hire labour for farming activities, while it is difficult to hire labour to substitute child labour in case of EGS. As a result, the agricultural support programme does not encourage households to use child time for work.

Although the PWP is not found to be effective in increasing children's attainment of grades and the time boys spend on studying at home, it does not encourage children to be more highly involved in work. Compared to EGS (its predecessor), PWP is more effective in reducing child work. Specifically, it helps households to reduce the amount of time children spend on child care and household chores. However, compared to AEP, the performance of PWP is lower in terms of increasing the time children spend on schooling, studying time and girls' highest grade completed. The possible reasons for the lower performance of PWP in reducing child labour and improving studying and attainment in school are that the return people get from PWP is very low and as a result it does not have a significant income effect on the household. The total amount of income households obtained from PSNP was around 11 per cent of the total consumption expenditure. Hence possible action to reduce the negative welfare impact of PWP are (1) to increase the wage rate households receive when

participating in PWP so as to make the income effect sufficiently higher than the substitution effect; (2) to make sending children to school a conditionality for households to be beneficiaries of PWP; and (3) to design a special programme that targets children instead of the household head only, for example, schooling feeding programmes. Putting an effective control system in place to enforce the government regulation banning child work in PWP might also be a possible way of reducing children' involvement in paid work.

DSP in rural and urban areas. DSP is one component of PSNP in Ethiopia. We have observed cash/food aid in both rural and urban areas and the cash handouts in urban areas which are also given to support children's education. For both rural and urban areas we have assessed the impact of the direct support component of the safety net programme, including the effects of cash/food aid and education support programmes on child work, time spent on schooling and studying, and highest grade completed by 12-year-old children. The results are provided in Table 5.3. Since the DSP does not require households to supply labour as condition of obtaining payment from the programme, we expected an income effect only, in the sense that if the programme is effective it should reduce child work and increase schooling and studying time and highest grade completed by children.

Our findings suggest that the DSP is effective in reducing child work and increasing children's schooling and studying at home. It also has a limited effect on the highest grade completed by children.

It seems that child total work declines by 0.65 hours per typical day (0.54 and 0.77 hours less per day for girls and boys respectively) as a result of households' participation in the DSPs, which is statistically significant for both boys and girls. The direct support is also found to have a negative and statistically significant effect on child work for paid and unpaid work outside the home and a positive effect on schooling and the highest grade completed by children. However, the effect of direct support on schooling and the highest grade completed is limited for urban boys.

The result seems not contrary to households' perception regarding the impact of these programmes on household and child welfare. Many households reported that the food aid and education support programmes have helped them to access a greater quantity and quality of food, but do not increase the time children spend on schooling and studying or reduce time spent working.

Table 5.1a. *Impact of the PWP of the PSNP on hours spent in a typical day on work, schooling and studying and on grade completed by children of 12 years old in rural areas (kernel matching)*

Outcome	ATTk	S.E.	T-stat
All children (N=584)			
Paid and unpaid work outside home	0.325	0.207	1.570
Unpaid work outside home	0.191	0.200	0.960
Paid work outside home	0.134	0.070	**1.920**
Child care and household chores	-0.567	0.172	**-3.300**
Total work	-0.269	0.199	-1.350
Schooling	0.146	0.163	0.900
Studying	0.133	0.089	1.490
Grade completed	0.249	0.166	1.500
Girls (N=283)			
Paid and unpaid work outside home	0.400	0.254	1.570
Unpaid work outside home	0.146	0.239	0.610
Paid work outside home	0.254	0.092	**2.760**
Child care and household chores	-0.501	0.235	**-2.140**
Total work	-0.115	0.271	-0.420
Schooling	0.250	0.230	1.090
Studying	0.255	0.123	**2.070**
Grade completed	0.184	0.233	0.790
Boys (N=301)			
Paid and unpaid work outside home	0.194	0.284	0.680
Unpaid work outside home	0.173	0.278	0.620
Paid work outside home	0.021	0.105	0.200
Child care and household chores	-0.571	0.205	**-2.780**
Total work	-0.416	0.290	-1.430
Schooling	0.056	0.231	0.240
Studying	0.020	0.129	0.160
Grade completed	0.323	0.233	1.390

For two tail test and for n>120, T values for 1%, 5%, and 10% levels of significance are 2.576, 1.96, and 1.645 respectively;
ATTk=average treatment effect of the treated using kernel matching

Table 5.1b. *Impact of EGS on hours spent in a typical day on work, schooling and studying and on grade completed by children of 12 years old in rural areas (kernel matching)*

Outcome	ATTk	S.E.	T-stat
All children (N=538)			
Paid and unpaid work outside home	0.309	0.200	1.540
Unpaid work outside home	0.043	0.192	0.230
Paid work outside home	0.266	0.078	**3.400**
Child care and household chores	-0.310	0.160	**-1.940**
Total work	-0.009	0.190	-0.050
Schooling	-0.355	0.158	**-2.250**
Studying	-0.018	0.086	-0.210
Grade completed	0.042	0.160	0.260
Girls (N=255)			
Paid and unpaid work outside home	-0.004	0.254	-0.020
Unpaid work outside home	-0.263	0.239	-1.100
Paid work outside home	0.259	0.115	**2.250**
Child care and household chores	-0.149	0.224	-0.670
Total work	-0.136	0.243	-0.560
Schooling	-0.246	0.228	-1.080
Studying	0.208	0.127	**1.630**
Grade completed	0.198	0.232	0.850
Boys (N=277)			
Paid and unpaid work outside home	0.055	0.269	0.210
Unpaid work outside home	-0.120	0.261	-0.460
Paid work outside home	0.176	0.100	**1.760**
Child care and household chores	-0.013	0.196	-0.070
Total work	0.012	0.275	0.040
Schooling	-0.360	0.221	**-1.630**
Studying	-0.182	0.123	-1.480
Grade completed	0.017	0.225	0.070

For two tail test and for n>120, T values for 1%, 5%, and 10% levels of significance are 2.576, 1.96, and 1.645 respectively;
ATTk=average treatment effect of the treated using kernel matching

Table 5.2. *Impact of agricultural extension support programme on hours spent in a typical day on work, schooling and studying and on grade completed 12-year-old children in rural areas (kernel matching)*

Outcome	ATTk	S.E.	T-stat
All children (N=584)			
Paid and unpaid work outside home	-0.294	0.245	-1.200
Unpaid work outside home	-0.056	0.242	-0.230
Paid work outside home	-0.238	0.053	**-4.480**
Child care and household chores	-0.190	0.195	-0.980
Total work	-0.503	0.218	**-2.310**
Schooling	0.717	0.180	**3.970**
Studying	0.202	0.111	**1.810**
Grade completed	0.314	0.200	1.570
Girls (N=283)		**Girls**	
Paid and unpaid work outside home	-0.186	0.276	-0.670
Unpaid work outside home	0.078	0.266	0.290
Paid work outside home	-0.264	0.079	**-3.320**
Child care and household chores	-0.418	0.224	**-1.860**
Total work	-0.614	0.285	**-2.150**
Schooling	0.927	0.217	**4.270**
Studying	0.134	0.138	0.970
Grade completed	0.534	0.241	**2.220**
Boys (N=301)		**Boys**	
Paid and unpaid work outside home	0.317	0.363	0.870
Unpaid work outside home	0.535	0.361	1.480
Paid work outside home	-0.218	0.072	**-3.040**
Child care and household chores	-0.618	0.290	**-2.130**
Total work	-0.326	0.334	-0.980
Schooling	0.321	0.319	1.000
Studying	0.290	0.196	1.480
Grade completed	-0.095	0.346	-0.270

For two tail test and for n>120, T values for 1%, 5%, and 10% levels of significance are 2.576, 1.96, and 1.645 respectively;
ATTk=average treatment effect of the treated using kernel matching

Table 5.3. *Impact of DSP on children's time use in hours per typical day in on work, schooling and studying and on grade completed by children of 12 years old in rural and urban areas (kernel matching)*

Outcome	Rural+Urban			Rural			Urban		
	ATTk (n=955)	S.E.	T-stat	ATTk (N=565)	S.E.	T-stat	ATTk (N=390)	S.E.	T-stat
All children									
Paid and unpaid work outside home	-0.796	0.139	**-5.71**	-0.643	0.223	**-2.88**	-0.316	0.144	**-2.19**
Unpaid work outside home	-0.697	0.128	**-5.45**	-0.59	0.2	**-2.95**	-0.164	0.12	-1.36
Paid work outside home	-0.1	0.052	**-1.93**	-0.053	0.084	-0.63	-0.152	0.079	**-1.93**
Child care and household chores	0.129	0.146	0.88	0.587	0.202	**2.9**	-0.259	0.208	-1.24
Total work	-0.652	0.181	**-3.59**	-0.018	0.24	-0.07	-0.577	0.236	**-2.44**
Schooling	-0.063	0.139	-0.45	-0.544	0.197	**-2.76**	0.119	0.184	0.65
Studying	0.049	0.081	0.61	-0.126	0.104	-1.21	0.099	0.12	0.82
Grade completed	0.492	0.14	**3.5**	0.178	0.206	0.86	0.276	0.167	**1.66**
Girls		**(N=464)**			**(N=271)**			**(N=194)**	
Paid and unpaid work outside home	-0.531	0.151	**-3.53**	-0.536	0.247	**-2.17**	-0.042	0.15	-0.28
Unpaid work outside home	-0.373	0.143	**-2.61**	-0.379	0.24	-1.58	0.107	0.122	0.88
Paid work outside home	-0.159	0.047	**-3.34**	-0.157	0.056	**-2.8**	-0.149	0.09	**-1.65**
Child care and household chores	-0.001	0.212	0	0.343	0.287	1.2	-0.183	0.314	-0.58
Total work	-0.538	0.241	**-2.23**	-0.2	0.332	-0.6	-0.229	0.329	-0.7
Schooling	-0.265	0.211	-1.26	-1.013	0.298	**-3.4**	0.132	0.277	0.48
Studying	-0.034	0.106	-0.32	-0.215	0.151	-1.43	0.017	0.15	0.12
Grade completed	0.316	0.2	1.58	-0.047	0.3	-0.16	0.094	0.244	0.38
Boys		**(N=490)**			**(N=294)**			**(N=196)**	
Paid and unpaid work outside home	-0.972	0.227	**-4.28**	-0.737	0.335	**-2.2**	-0.539	0.241	**-2.24**
Unpaid work outside home	-0.936	0.204	**-4.6**	-0.78	0.286	**-2.73**	-0.399	0.202	**-1.97**
Paid work outside home	-0.036	0.094	-0.38	0.044	0.154	0.29	-0.14	0.131	-1.07
Child care and household chores	0.163	0.169	0.96	0.806	0.248	**3.25**	-0.536	0.218	**-2.46**
Total work	-0.77	0.27	**-2.85**	0.151	0.349	0.43	-1.075	0.308	**-3.49**
Schooling	0.114	0.18	0.63	-0.11	0.255	-0.43	0.101	0.239	0.42
Studying	0.136	0.123	1.1	-0.044	0.145	-0.3	0.209	0.194	1.08
Grade completed	0.665	0.198	**3.35**	0.385	0.287	1.34	0.484	0.222	**2.18**

6. Conclusion and policy implications

Ethiopia's public employment programme started in the 1980s and was associated with the rehabilitation programme known as the Food for Work programme. From 1997 to 2004, the government introduced relief-based Cash and Food for Work programmes known as EGS. Associated with these, there were Free Food Aid Programmes that provided food aid to people affected by drought. In 2005, a new public employment programme popularly known as the Productive Safety Net Programme (PSNP) was established in order to support households in absolute poverty and to protect households from falling into poverty. The PSNP has two components, namely the Public Work Programme (PWP) and Direct Support Programme (DSP). While beneficiaries have to supply labour in return for a daily unskilled wage to be part of the PWP, poor people unable to supply labour are entitled to be part of the DSP in order to get free cash and/or food aid. Complementary to PSNP is an agricultural extension support programme designed to help households involved in agriculture proper. This paper tries to identify the effect of households' involvement in PWP, DSP and the agricultural extension programme on the time allocation of children to work, schooling and studying at home. Children's work is considered as total work, and paid work and unpaid work separately. The effect on time allocation is also disaggregated by the gender of the children.

Although the PWP component of PSNP increased the amount of time both girls and boys spent on paid work by 0.13 hours per day, it reduced the amount of time girls spent on child care and household chores by half an hour per day. The net effect is that children's total hours spent on work are reduced. Moreover, PWP also increased the time girls spent on studying by 0.25 hours per day. In terms of child welfare outcome, the effect of the PWP of the PSNP is much better than that of its predecessor, EGS. The positive impact of the PWP of the PSNP on paid child work (0.13 hours per day) is half of that of EGS (0.26 hours per day). Moreover, EGS did not reduce the amount of time boys and girls spent on childcare and household chores. Rather, it reduced boys' time spent on schooling (0.36 hours less per day).

Direct support (the second component of PSNP) was found to be effective in reducing child work in paid and unpaid activities and in increasing grades completed by boys in both rural and urban areas. In rural areas, boys' hours of unpaid work outside home and girls' hours of childcare and household chores declined. For urban areas, girls' hours of paid work and boys' hours of paid and unpaid work and total work declined significantly. We also found that the grade boys completed in urban areas increased by half a year.

Substantial number of households have participated in the agricultural extension programme in order to get expert advice on the use of modern inputs and improved cultural practices, such as modern hoeing, weeding, harvesting and irrigation techniques. Such practices have the potential to increase farm income and labour use, and hence children from households which obtained agricultural extension support may work less and spend more time in schooling and studying at home if households get richer as a result of the support programme. On the other hand, if households cannot meet the increased demand for labour by using adult family and/or hired labour, children may spend increased time working and less on schooling and studying at home. In our Young Lives sample households, we found the latter effect (substitution effect) is dominated by the former (income effect) and as a

result, participation of households in the agricultural support programme reduced hours spent on paid work (0.23 hour less per day) and childcare and household chores for girls and boys (0.41 and 0.61 hours less per day, respectively) and increases hours of schooling time spent by 0.92 hours per day.

To conclude, although PSNP targets households, it has been instrumental in improving child well-being in terms of reducing total time spent on working, childcare and household chores and increasing girls' time spent on studying, which has a strong implication for the quality of education. However, the PWP part of the PSNP is still not effective enough to reduce children's involvement in paid work, or to increase the highest grade completed and time children spent on studying at home. Since the programme started only 12 months prior to survey, it is too early to capture the full impact of the programme.

The implications of the study are, therefore, that programmes have to be designed in such a way as to be compatible with household behaviour in order to reduce the negative effects of PWP on children. Consideration should be given to shifting the support programme from PWP to conditional on school attendance; and to supporting households through activities that have a higher income effect than substitution effect, such as extension support. Moreover, the design of the PSNP should consider the substitution effect on children and hence target children instead of households. In this regard, perhaps considering changing part of the PWP into school feeding would be important. Moreover, the gender impacts of labour requirements need further attention to ensure that programmes do not have negative impacts for women/men and girls/boys. Households unable to provide adult labour should receive direct support. The payment made to beneficiaries of PWP was not high enough to discourage children from engaging in paid and unpaid work. It would therefore be desirable to increase the payment for public work to make it more beneficial to children. In particular, payment in real terms should be set reasonably high by indexing the wage rate to inflation.

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Appendix A4

Descriptive statistics

Table A4.1. *Mean values of variables at household level for rural and urban areas*

Variables	Rural mean	Urban mean	Total mean
Age of household head	43	41.9	42.7
Sex of household head	0.813	0.672	0.756
Mother's educational level (Round 1)	0.723	3.44	1.821
Father's educational level (Round 1)	1.414	3.74	2.353
Father's education level (Round 2)	2.808	5.31	3.82
Mother's education level (Round 2)	1.334	4.28	2.524
Distance to school	35.822	22.59	30.477
Birth order	4.014	3.55	3.827
Asset index for 8-year-olds (Round 1)	0.245	0.13	0.198
Wealth index for 8-year-olds (Round 1)	0.084	0.32	0.179
Asset index square (ai182)	0.067	0.03	0.052
Wealth index square (wi182)	0.013	0.12	0.057
Number of dependants in the household	1.459	0.93	1.246
Number of 17-65 male fam. members	1.204	1.17	1.189
Number of 17-65 female fam. members	1.238	1.4	1.303
Death or illness dummy (Round 2)	0.459	0.46	0.461
Theft dummy (Round 2)	0.139	0.13	0.136
Increase in input price dummy (Round 2)	0.377	0.19	0.302
Increase in input price or decrease in output price dummy (Round 2)	0.399	0.2	0.32
Death of livestock dummy (Round 2)	0.377	0.08	0.257
Dummy for place employment shutdown or job lose (Round 2)	0.053	0.18	0.104
Drought dummy (Round 2)	0.469	0.07	0.306
Dummy for drought crop failure and pests and diseases (Round 2)	0.723	0.12	0.481
Having to pay for school dummy (Round 2)	0.096	0.1	0.098
New HH member or birth dummy (Round 2)	0.212	0.09	0.162
Natural disaster including drought (Round 2)	0.651	0.1	0.43
Death or illness dummy (Round 1)	0.265	0.34	0.294
Theft dummy (Round 1)	0.12	0.07	0.101
Death of livestock dummy (Round 1)	0.399	0.1	0.278
Dummy for place employment shutdown or job lose (Round 1)	0.122	0.23	0.164
Dummy for drought crop failure and pests and diseases (Round 1)	0.661	0.08	0.424
Having to pay for school dummy (Round 1)	0.111	0.16	0.132
New HH member or birth dummy (Round 1)	0.116	0.1	0.11
Natural disaster including drought (Round 1)	0.396	0.05	0.256
Dummy for Addis Ababa	0	0.36	0.146
Dummy for Amhara	0.245	0.12	0.196
Dummy for Oromia	0.247	0.14	0.204
Dummy for SNNP	0.252	0.24	0.249
Dummy for Tigray	0.257	0.13	0.205
Urban dummy			0.4

Table A4.2. *Percentage of children who missed class and dropouts*

	Rural	Urban	Total
Per cent of 12-year-old children who dropped out from school	3.04	2.03	2.30%
Percentage of children who missed classes for more than one whole week in the last 12 months	13.8	14.7	14.3
Number of days missed in the last 12 months	6	4.4	5.3
Time (in minutes) it takes children to reach school	35.8	22.6	30.5

Table A4.3. *Time of the year (months) when children are most absent from school*

	Rural	Urban	Total
September	2.9	1.92	2.48
October	**23.19**	9.62	17.36
November	**24.64**	23.08	23.97
December	**18.84**	11.54	15.7
January	**13.04**	17.31	14.88
February	1.45	11.54	5.79
March	5.8	3.85	4.96
April	1.45	7.69	4.13
May	5.8	7.69	6.61
June	2.9	5.77	4.13

Table A4.4. *Reasons for missing schooling over the last 12 months*

	Rural	Urban	Total
Need for domestic work and/or agricultural work at home	31.1	1.8	18.3
Had to do paid work	46.0	73.7	58.0
Others reasons	23.0	24.6	23.7

Appendix A5

Results of propensity score regression

Table A5.1a. *First stage logistic regression (propensity score) of public work part of the PSNP in rural areas and descriptive statics*

Explanatory variables	First stage logistic regression				Before matching			After matching		
					untreated (n=303)	treated (n=270)	all (n=584)	untreated (n=159)	treated (n=262)	all (n=421)
	Coef.	*S.E*	*z*	*P>z*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
maxedur1	-0.075	0.048	-1.590	0.113	5.122	4.458	4.814	4.805	4.458	4.589
ai18	8.702	8.537	1.020	0.308	0.268	0.218	0.245	0.256	0.218	0.233
wi18	-32.514	10.859	-2.990	0.003	0.076	0.093	0.084	0.065	0.092	0.082
ai182	-51.567	20.968	-2.460	0.014	0.076	0.056	0.067	0.070	0.056	0.061
wi182	23.064	22.797	1.010	0.312	0.011	0.014	0.013	0.008	0.014	0.012
asaw	-16.212	26.867	-0.600	0.546	0.021	0.020	0.020	0.017	0.019	0.018
depen	0.054	0.654	0.080	0.935	1.510	1.400	1.459	1.421	1.405	1.411
wdepn	0.656	1.933	0.340	0.734	0.112	0.132	0.121	0.088	0.131	0.115
asdepn	-0.069	2.398	-0.030	0.977	0.417	0.326	0.375	0.377	0.326	0.345
w7to17	5.388	2.385	2.260	0.024	0.140	0.172	0.155	0.115	0.172	0.151
w17to65m	3.821	2.497	1.530	0.126	0.095	0.110	0.102	0.076	0.111	0.097
w17to65f	3.950	3.946	1.000	0.317	0.091	0.121	0.105	0.081	0.120	0.105
wdcropfr2	7.294	4.950	1.470	0.141	0.045	0.068	0.055	0.049	0.066	0.060
wdcattler2	2.373	3.998	0.590	0.553	0.025	0.040	0.032	0.027	0.039	0.034
wddillnesr2	-2.824	3.869	-0.730	0.465	0.032	0.038	0.035	0.033	0.036	0.035
a7to17	-0.320	2.722	-0.120	0.906	0.513	0.405	0.463	0.468	0.410	0.432
a17to65m	1.298	2.658	0.490	0.625	0.347	0.277	0.315	0.318	0.279	0.294
a17to65f	-0.266	3.971	-0.070	0.947	0.328	0.274	0.303	0.319	0.275	0.292
adcattler2	4.823	4.136	1.170	0.244	0.101	0.095	0.098	0.104	0.094	0.097
addillnesr2	2.200	3.644	0.600	0.546	0.130	0.097	0.114	0.132	0.097	0.110
ch7to17	-0.273	0.730	-0.370	0.708	1.873	1.819	1.848	1.799	1.840	1.824
nbn17_65mr1	-0.323	0.747	-0.430	0.665	1.223	1.181	1.204	1.164	1.195	1.183
nbn17_65fr1	-0.055	1.141	-0.050	0.961	1.217	1.263	1.238	1.233	1.267	1.254
dcropfr2	0.610	0.670	0.910	0.363	0.672	0.781	0.723	0.786	0.779	0.781
ddillnesr2	-0.566	0.987	-0.570	0.567	0.481	0.433	0.459	0.516	0.431	0.463
dtheftr2	0.505	0.384	1.310	0.189	0.137	0.141	0.139	0.157	0.141	0.147
dinputpr2	0.691	0.984	0.700	0.483	0.446	0.296	0.377	0.447	0.305	0.359
dpricer2	-0.491	0.967	-0.510	0.612	0.471	0.315	0.399	0.459	0.321	0.373
dcattler2	-1.459	1.130	-1.290	0.197	0.357	0.400	0.377	0.384	0.397	0.392
dnewhhr2	-0.239	0.330	-0.720	0.470	0.185	0.244	0.212	0.220	0.248	0.238
dndisr2	-0.949	0.552	-1.720	0.086	0.631	0.674	0.651	0.736	0.672	0.696
comm_7	0.291	0.629	0.460	0.643	0.080	0.078	0.079	0.138	0.076	0.100
comm_8	0.490	0.647	0.760	0.449	0.099	0.067	0.084	0.164	0.061	0.100
comm_9	2.432	0.699	3.480	0.001	0.022	0.159	0.086	0.044	0.164	0.119
comm_10	0.051	0.635	0.080	0.935	0.108	0.056	0.084	0.145	0.057	0.090
comm_18	-0.350	0.668	-0.520	0.600	0.121	0.041	0.084	0.157	0.042	0.086
comm_19	-1.571	0.674	-2.330	0.020	0.134	0.026	0.084	0.126	0.027	0.064
comm_20	2.884	0.723	3.990	0.000	0.029	0.148	0.084	0.057	0.145	0.112
comm_21	3.149	0.789	3.990	0.000	0.013	0.170	0.086	0.025	0.172	0.116
comm_23	4.002	0.884	4.530	0.000	0.019	0.163	0.086	0.031	0.160	0.112
comm_24	-1.582	1.028	-1.540	0.124	0.025	0.007	0.017	0.013	0.008	0.010
_cons	2.454	1.860	1.320	0.187						
Number of obs	484									
LR chi2(41)	243.4									
Prob > chi2	0.000									
Pseudo R2	0.365									
Log likelihood =	-212									

See Table A5.5 below for description of variables abbreviated

Table A5.1b. *Impact of PSNP on child welfare whose parents participate in public work component of PSNP*

	All			**All**		
Variable	***TTk***	***S.E.***	***T-stat***	***ATTn***	***S.E.***	***T-stat***
work	0.325	0.207	1.570	0.968	0.436	2.220
cnpaywrk	0.191	0.200	0.960	0.853	0.423	2.020
cpaywork	0.134	0.070	**1.920**	0.115	0.121	0.950
chcaredom	-0.567	0.172	**-3.300**	-0.078	0.435	-0.180
cpayunpaidw	-0.269	0.199	-1.350	0.887	0.461	1.920
cschool	0.146	0.163	0.900	-0.185	0.421	-0.440
cstudy	0.133	0.089	1.490	-0.121	0.218	-0.550
gradnow	0.249	0.166	1.500	-0.660	0.373	-1.770
	girls					
work	0.400	0.254	1.570	-0.584	0.507	-1.150
cnpaywrk	0.146	0.239	0.610	-0.541	0.481	-1.120
cpaywork	0.254	0.092	**2.760**	-0.043	0.116	-0.370
chcaredom	-0.501	0.235	**-2.140**	0.473	0.600	0.790
cpayunpaidw	-0.115	0.271	-0.420	-0.112	0.625	-0.180
cschool	0.250	0.230	1.090	0.293	0.558	0.520
cstudy	0.255	0.123	2.070	-0.210	0.273	-0.770
gradnow	0.184	0.233	0.790	-0.237	0.546	-0.430
	boys					
work	0.194	0.284	0.680	1.251	0.512	2.450
cnpaywrk	0.173	0.278	0.620	1.297	0.501	2.590
cpaywork	0.021	0.105	0.200	-0.046	0.269	-0.170
chcaredom	-0.571	0.205	**-2.780**	-0.261	0.452	-0.580
cpayunpaidw	-0.416	0.290	-1.430	0.980	0.564	1.740
cschool	0.056	0.231	0.240	-0.218	0.465	-0.470
cstudy	0.020	0.129	0.160	-0.163	0.262	-0.620
gradnow	0.323	0.233	1.390	-0.370	0.450	-0.820

note: For two tail test and for n>120, T values for 1%, 5%, and 10% levels of significance are 2.576, 1.96, and 1.645, respectively
ATTk=average treatment effect of the treated using kernel matching
ATTn=average treatment effect of the treated using nearest neighbourhood matching

Table A5.2a. *First stage logistic regression (propensity score) for EGS in rural areas and descriptive statics*

Explanatory variables	First stage logistic regression				Before matching			After matching		
					Untreated (n=362)	Treated (n=222)	Total (n=584)	Untreated (n=309)	Treated n=222)	Total (n=531)
	Coef.	*S.E*	*Z*	*P>Z*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
ai18	-1.083	6.871	-0.160	0.875	0.255	0.228	0.245	0.250	0.228	0.241
wi18	-5.122	8.574	-0.600	0.550	0.087	0.078	0.084	0.092	0.078	0.086
ai182	-36.710	15.716	-2.340	0.020	0.071	0.060	0.067	0.069	0.060	0.065
wi182	9.625	17.546	0.550	0.583	0.013	0.011	0.013	0.014	0.011	0.013
asaw	-5.825	19.190	-0.300	0.761	0.022	0.017	0.020	0.022	0.017	0.020
depen	-0.430	0.467	-0.920	0.358	1.541	1.324	1.459	1.456	1.324	1.401
wdepn	-2.489	1.648	-1.510	0.131	0.134	0.100	0.121	0.132	0.100	0.119
asdepn	2.237	1.642	1.360	0.173	0.404	0.327	0.375	0.372	0.327	0.353
w7to17	-0.195	1.648	-0.120	0.906	0.162	0.143	0.155	0.169	0.143	0.158
w17to65m	3.144	1.919	1.640	0.101	0.107	0.095	0.102	0.112	0.095	0.105
w17to65f	0.698	3.132	0.220	0.824	0.108	0.099	0.105	0.115	0.099	0.109
wdcropfr2	0.887	3.457	0.260	0.798	0.057	0.052	0.055	0.060	0.052	0.057
wdcattler2	-5.386	3.324	-1.620	0.105	0.032	0.032	0.032	0.031	0.032	0.032
wddillnesr2	4.802	3.185	1.510	0.132	0.034	0.036	0.035	0.034	0.036	0.035
a7to17	4.028	1.915	2.100	0.035	0.477	0.441	0.463	0.466	0.441	0.456
a17to65m	1.938	1.824	1.060	0.288	0.325	0.297	0.315	0.316	0.297	0.308
a17to65f	-0.041	2.569	-0.020	0.987	0.313	0.286	0.303	0.312	0.286	0.301
adcropfr2	1.268	2.865	0.440	0.658	0.186	0.174	0.182	0.181	0.174	0.178
adcattler2	0.734	3.112	0.240	0.814	0.094	0.105	0.098	0.083	0.105	0.092
addillnesr2	0.333	2.656	0.130	0.900	0.117	0.111	0.114	0.110	0.111	0.110
ch7to17	-1.000	0.514	-1.950	0.052	1.843	1.856	1.848	1.848	1.856	1.851
nbn17_65mr1	-0.493	0.512	-0.960	0.336	1.215	1.185	1.204	1.204	1.185	1.196
nbn17_65fr1	-0.195	0.764	-0.250	0.799	1.235	1.243	1.238	1.256	1.243	1.250
ddillnesr2	-0.366	0.738	-0.500	0.620	0.450	0.473	0.459	0.430	0.473	0.448
dtheftr2	-0.218	0.342	-0.640	0.524	0.133	0.149	0.139	0.126	0.149	0.136
dinputpr2	0.972	0.773	1.260	0.209	0.401	0.338	0.377	0.359	0.338	0.350
dpricer2	-0.832	0.772	-1.080	0.281	0.425	0.356	0.399	0.379	0.356	0.369
dcattler2	0.585	0.878	0.670	0.506	0.351	0.419	0.377	0.320	0.419	0.362
dcropfr2	-0.111	0.846	-0.130	0.896	0.715	0.734	0.723	0.712	0.734	0.721
dnewhhr2	0.065	0.291	0.220	0.822	0.210	0.216	0.212	0.201	0.216	0.207
dndisr2	-0.844	0.460	-1.840	0.066	0.663	0.631	0.651	0.660	0.631	0.648
comm_6	0.849	0.595	1.430	0.154	0.039	0.135	0.075	0.045	0.135	0.083
comm_7	1.013	0.533	1.900	0.057	0.050	0.126	0.079	0.058	0.126	0.087
comm_8	1.479	0.478	3.090	0.002	0.047	0.144	0.084	0.055	0.144	0.092
comm_9	2.604	0.582	4.470	0.000	0.019	0.194	0.086	0.023	0.194	0.094
comm_10	-1.219	0.586	-2.080	0.037	0.116	0.032	0.084	0.123	0.032	0.085
comm_12	-1.108	0.628	-1.760	0.078	0.094	0.041	0.074	0.110	0.041	0.081
comm_18	-1.096	0.594	-1.840	0.065	0.113	0.036	0.084	0.126	0.036	0.089
comm_19	-0.951	0.592	-1.610	0.108	0.108	0.045	0.084	0.123	0.045	0.090
comm_21	0.257	0.497	0.520	0.604	0.088	0.081	0.086	0.104	0.081	0.094
comm_23	-0.431	0.572	-0.750	0.452	0.091	0.077	0.086	0.107	0.077	0.094
comm_24	0.250	0.850	0.290	0.769	0.014	0.023	0.017	0.016	0.023	0.019
_cons	2.717	1.628	1.670	0.095						
Number of obs	538									
LR chi2(42)	167.24									
Prob > chi2	0.000									
Pseudo R2	0.229									
Log likelihood =	-281.04									

For two tail test and for n>120, T values for 1%, 5%, and 10% levels of significance are 2.576, 1.96, and 1.645 respectively;
ATTk=average treatment effect of the treated using kernel matching
ATTn=nearest neighborhood

Table A5.2b. *Impact of EGS on child welfare*

Variable	ATTk	S.E.	T-stat	ATTn	S.E.	T-stat
All children (N=538)						
Paid and unpaid work outside home	0.309	0.200	1.540	0.497	0.339	1.470
Unpaid work outside home	0.043	0.192	0.230	0.287	0.328	0.870
Paid work outside home	0.266	0.078	3.400	0.210	0.113	1.860
Child care and household chores	-0.310	0.160	-1.940	-0.250	0.285	-0.880
Total work	-0.009	0.190	-0.050	0.247	0.326	0.760
Schooling	-0.355	0.158	-2.250	-0.127	0.251	-0.500
Studying	-0.018	0.086	-0.210	-0.286	0.153	-1.870
Grade completed	0.042	0.160	0.260	-0.078	0.264	-0.300
Girls (N=255)						
Paid and unpaid work outside home	-0.004	0.254	-0.020	0.328	0.447	0.730
Unpaid work outside home	-0.263	0.239	-1.100	0.066	0.428	0.150
Paid work outside home	0.259	0.115	2.250	0.263	0.139	1.900
Child care and household chores	-0.149	0.224	-0.670	-0.726	0.405	-1.790
Total work	-0.136	0.243	-0.560	-0.380	0.505	-0.750
Schooling	-0.246	0.228	-1.080	-0.115	0.408	-0.280
Studying	0.208	0.127	1.630	0.160	0.210	0.760
Grade completed	0.198	0.232	0.850	-0.043	0.392	-0.110
Boys (N=277)						
Paid and unpaid work outside home	0.055	0.269	0.210	0.255	0.404	0.630
Unpaid work outside home	-0.120	0.261	-0.460	0.176	0.401	0.440
Paid work outside home	0.176	0.100	1.760	0.079	0.155	0.510
Child care and household chores	-0.013	0.196	-0.070	0.043	0.297	0.140
Total work	0.012	0.275	0.040	0.264	0.380	0.690
Schooling	-0.360	0.221	-1.630	-0.172	0.308	-0.560
Studying	-0.182	0.123	-1.480	-0.316	0.192	-1.650
Grade completed	0.017	0.225	0.070	0.015	0.327	0.050

Table A5.3a. *First stage logistic regression (propensity score) of agricultural extension support programme for rural areas*

Explanatory variable	First stage logistic regression				Before matching			After matching		
					Untreated (n=480)	Treated (n=104)	Total (n=584)	Untreated (n=242)	Treated (n=100)	Total (n=342)
	Coef.	*S.E*	*z*	*P>z*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
maxedur1	0.15	0.06	2.64	0.008	4.778	4.980	4.814	4.851	4.980	4.889
ai18	8.17	12.50	0.65	0.513	0.249	0.229	0.245	0.248	0.228	0.242
wi18	-18.17	16.16	-1.12	0.261	0.077	0.116	0.084	0.082	0.115	0.092
ai182	28.87	30.51	0.95	0.344	0.068	0.060	0.067	0.068	0.060	0.065
wi182	-10.12	30.66	-0.33	0.741	0.011	0.018	0.013	0.012	0.017	0.014
Asaw	36.65	33.62	1.09	0.276	0.019	0.027	0.020	0.020	0.026	0.022
Depen	1.47	0.73	2	0.045	1.440	1.548	1.459	1.393	1.540	1.436
Wdepn	0.12	2.74	0.04	0.966	0.109	0.179	0.121	0.107	0.174	0.127
Asdepn	-4.95	2.52	-1.96	0.05	0.377	0.364	0.375	0.358	0.359	0.359
w7to17	-1.85	2.63	-0.7	0.482	0.141	0.217	0.155	0.155	0.217	0.173
w17to65m	1.65	3.56	0.46	0.644	0.094	0.139	0.102	0.098	0.139	0.110
w17to65f	2.80	4.78	0.59	0.557	0.094	0.153	0.105	0.104	0.151	0.118
wdcropfr2	5.00	5.38	0.93	0.353	0.047	0.095	0.055	0.051	0.095	0.064
wdcattler2	14.20	5.47	2.6	0.009	0.027	0.055	0.032	0.033	0.054	0.039
wddillnesr2	2.89	5.34	0.54	0.589	0.032	0.050	0.035	0.029	0.046	0.034
a7to17	-4.59	2.82	-1.63	0.104	0.471	0.425	0.463	0.475	0.426	0.460
a17to65m	-3.34	2.70	-1.24	0.215	0.324	0.269	0.315	0.305	0.271	0.295
a17to65f	0.19	3.42	0.06	0.955	0.306	0.287	0.303	0.307	0.285	0.301
adcropfr2	-5.28	5.39	-0.98	0.327	0.179	0.193	0.182	0.183	0.195	0.186
adcattler2	1.41	4.55	0.31	0.757	0.097	0.101	0.098	0.097	0.099	0.098
addillnesr2	-4.13	4.73	-0.87	0.382	0.117	0.102	0.114	0.104	0.098	0.102
ch7to17	1.31	0.80	1.63	0.103	1.842	1.875	1.848	1.872	1.890	1.877
nbn17_65mr1	0.09	0.77	0.12	0.906	1.213	1.163	1.204	1.161	1.180	1.167
nbn17_65fr1	-0.31	1.07	-0.29	0.769	1.227	1.288	1.238	1.227	1.290	1.246
ddillnesr2	0.92	1.33	0.69	0.489	0.465	0.433	0.459	0.426	0.420	0.424
dtheftr2	0.33	0.56	0.59	0.558	0.148	0.096	0.139	0.116	0.100	0.111
dinputpr2	-2.03	0.93	-2.17	0.03	0.415	0.202	0.377	0.368	0.200	0.319
dpricer2	1.46	0.92	1.59	0.113	0.433	0.240	0.399	0.393	0.240	0.348
dcattler2	-1.55	1.36	-1.14	0.256	0.367	0.423	0.377	0.372	0.420	0.386
dcropfr2	1.36	1.56	0.87	0.384	0.698	0.837	0.723	0.711	0.850	0.751
dnewhhr2	-0.56	0.45	-1.26	0.207	0.206	0.240	0.212	0.190	0.240	0.205
dndisr2	0.56	0.69	0.81	0.419	0.627	0.760	0.651	0.661	0.770	0.693
comm_7	-1.15	1.40	-0.82	0.412	0.090	0.029	0.079	0.149	0.030	0.114
comm_8	-2.62	1.61	-1.62	0.105	0.100	0.010	0.084	0.087	0.010	0.064
comm_9	-2.88	1.68	-1.72	0.086	0.102	0.010	0.086	0.045	0.010	0.035
comm_10	-1.07	1.41	-0.76	0.447	0.096	0.029	0.084	0.165	0.030	0.126
comm_12	-0.64	1.49	-0.43	0.665	0.083	0.029	0.074	0.112	0.020	0.085
comm_19	0.40	1.33	0.3	0.766	0.081	0.096	0.084	0.161	0.100	0.143
comm_20	2.51	1.31	1.92	0.055	0.035	0.308	0.084	0.062	0.310	0.135
comm_21	1.85	1.32	1.41	0.16	0.048	0.260	0.086	0.091	0.270	0.143
comm_23	2.36	1.33	1.77	0.077	0.056	0.221	0.086	0.103	0.210	0.135
_cons	-5.82	2.72	-2.13	0.033						
Number of obs	426									
LR chi2(41)	188.42									
Prob > chi2	0.000									
Pseudo R2	0.4058									
Log likelihood =	-137.935									

See Table A5.5 below for the description of variables abbreviated

Table A5.3b. *Impact of agricultural extension programme*

Outcome	Kernel matching			Nearest neighbourhood method		
	Att	***S.E.***	***T-stat***	***Att***	***S.E.***	***T-stat***
All children						
work	-0.294	0.245	-1.200	-0.635	0.431	-1.470
cnpaywrk	-0.056	0.242	-0.230	-0.379	0.428	-0.880
cpaywork	-0.238	0.053	**-4.480**	-0.257	0.099	-2.600
chcaredom	-0.190	0.195	-0.980	0.614	0.328	1.870
cpayunpaidw	-0.503	0.218	**-2.310**	-0.067	0.403	-0.170
cschool	0.717	0.180	**3.970**	0.432	0.335	1.290
cstudy	0.202	0.111	**1.810**	-0.027	0.195	-0.140
gradnow	0.314	0.200	1.570	0.007	0.364	0.020
Girls						
work	-0.186	0.276	-0.670	-0.415	0.594	-0.700
cnpaywrk	0.078	0.266	0.290	-0.141	0.572	-0.250
cpaywork	-0.264	0.079	**-3.320**	-0.274	0.091	-3.030
chcaredom	-0.418	0.224	**-1.860**	0.685	0.536	1.280
cpayunpaidw	-0.614	0.285	**-2.150**	0.262	0.638	0.410
cschool	0.927	0.217	**4.270**	0.297	0.566	0.530
cstudy	0.134	0.138	0.970	-0.340	0.334	-1.020
gradnow	0.534	0.241	**2.220**	-0.011	0.589	-0.020
Boys						
work	0.317	0.363	0.870	-0.049	0.545	-0.090
cnpaywrk	0.535	0.361	1.480	0.195	0.553	0.350
cpaywork	-0.218	0.072	**-3.040**	-0.243	0.163	-1.500
chcaredom	-0.618	0.290	**-2.130**	0.135	0.398	0.340
cpayunpaidw	-0.326	0.334	-0.980	0.006	0.546	0.010
cschool	0.321	0.319	1.000	0.350	0.481	0.730
cstudy	0.290	0.196	1.480	0.170	0.282	0.600
gradnow	-0.095	0.346	-0.270	-0.081	0.494	-0.160

Table A5.4. *First stage logistic regression (propensity score) of direct support (part of the PSNP) for rural and urban areas*

Explanatory variables	First stage logistic regression of dummy for receiving direct support				Before matching			After matching		
					Untreated N=719	Treated N=236	All N=955	Untreated N=693	Treated N=236	All N=929
	Coef.	*S. E*	*Z*	*P>z*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
maxedur1	-0.027	0.031	-0.880	0.380	6.143	6.386	6.203	6.150	6.386	6.210
ai18	5.622	4.139	1.360	0.174	0.205	0.177	0.198	0.202	0.176	0.195
wi18	0.529	3.338	0.160	0.874	0.176	0.188	0.179	0.179	0.190	0.181
ai182	-26.180	11.436	-2.290	0.022	0.054	0.044	0.052	0.053	0.044	0.051
wi182	-3.424	3.929	-0.870	0.383	0.055	0.062	0.057	0.057	0.062	0.058
asaw	8.629	6.818	1.270	0.206	0.031	0.028	0.030	0.031	0.028	0.030
depen	0.269	0.270	1.000	0.318	1.270	1.172	1.246	1.255	1.165	1.233
wdepn	-0.906	0.641	-1.410	0.157	0.195	0.178	0.191	0.196	0.180	0.192
asdepn	-0.627	0.958	-0.650	0.513	0.291	0.243	0.279	0.283	0.240	0.272
w7to17	1.495	0.752	1.990	0.047	0.319	0.356	0.328	0.325	0.360	0.334
w17to65m	0.100	0.602	0.170	0.868	0.227	0.219	0.225	0.232	0.222	0.229
w17to65f	-1.768	0.947	-1.870	0.062	0.244	0.259	0.248	0.247	0.262	0.251
wdcropfr2	-2.913	2.008	-1.450	0.147	0.048	0.038	0.046	0.045	0.038	0.043
wdcattler2	-2.674	2.010	-1.330	0.183	0.032	0.016	0.028	0.031	0.016	0.027
wddillnesr2	2.353	1.209	1.950	0.052	0.071	0.113	0.081	0.071	0.114	0.082
a7to17	0.412	1.007	0.410	0.683	0.391	0.325	0.375	0.389	0.324	0.373
a17to65m	0.377	0.970	0.390	0.697	0.266	0.214	0.253	0.263	0.215	0.251
a17to65f	-1.326	1.486	-0.890	0.372	0.263	0.232	0.255	0.259	0.232	0.252
adcattler2	1.003	2.593	0.390	0.699	0.069	0.044	0.063	0.067	0.042	0.061
addillnesr2	-2.578	1.732	-1.490	0.137	0.094	0.093	0.094	0.094	0.094	0.094
ch7to17	-0.307	0.296	-1.040	0.301	1.864	1.812	1.851	1.882	1.818	1.865
nbn17_65mr1	-0.054	0.275	-0.200	0.845	1.216	1.105	1.189	1.229	1.110	1.199
nbn17_65fr1	0.672	0.419	1.600	0.109	1.296	1.326	1.303	1.300	1.331	1.308
dcropfr2	0.936	0.488	1.920	0.055	0.491	0.448	0.481	0.479	0.441	0.469
ddillnesr2	0.634	0.480	1.320	0.186	0.433	0.548	0.461	0.436	0.555	0.466
dtheftr2	-0.291	0.281	-1.030	0.301	0.142	0.117	0.136	0.144	0.110	0.136
dinputpr2	-1.149	0.639	-1.800	0.072	0.302	0.301	0.302	0.313	0.305	0.311
dpricer2	1.007	0.632	1.590	0.111	0.316	0.335	0.320	0.328	0.335	0.329
dcattler2	-0.232	0.728	-0.320	0.750	0.281	0.184	0.257	0.274	0.178	0.250
dnewhhr2	-0.286	0.277	-1.030	0.301	0.174	0.126	0.162	0.160	0.127	0.152
dndisr2	-0.620	0.405	-1.530	0.126	0.447	0.377	0.430	0.433	0.369	0.417
demplr2	0.298	0.275	1.080	0.279	0.085	0.163	0.104	0.087	0.165	0.107
dedupr2	0.466	0.296	1.570	0.116	0.090	0.121	0.098	0.097	0.123	0.103
comm_2	-1.688	0.535	-3.150	0.002	0.058	0.025	0.050	0.061	0.025	0.052
comm_3	-1.707	0.852	-2.000	0.045	0.019	0.008	0.016	0.020	0.008	0.017
comm_4	-0.706	0.578	-1.220	0.222	0.031	0.029	0.031	0.033	0.030	0.032
comm_5	0.839	0.414	2.030	0.043	0.028	0.117	0.050	0.029	0.119	0.052
comm_7	-0.955	0.557	-1.720	0.086	0.054	0.025	0.047	0.058	0.021	0.048
comm_8	-0.177	0.479	-0.370	0.712	0.051	0.046	0.050	0.052	0.038	0.048
comm_9	-1.473	0.599	-2.460	0.014	0.062	0.017	0.051	0.066	0.017	0.054
comm_10	1.750	0.436	4.010	0.000	0.030	0.113	0.050	0.032	0.114	0.053
comm_11	0.658	0.452	1.460	0.145	0.038	0.088	0.050	0.040	0.089	0.053
comm_12	-2.208	1.056	-2.090	0.037	0.057	0.004	0.044	0.045	0.004	0.034
comm_13	0.124	0.451	0.270	0.783	0.047	0.046	0.047	0.051	0.047	0.050
comm_14	-1.867	0.567	-3.290	0.001	0.059	0.021	0.050	0.062	0.021	0.052
comm_15	-1.474	0.606	-2.430	0.015	0.039	0.021	0.035	0.040	0.021	0.036
comm_16	-0.064	1.243	-0.050	0.959	0.004	0.004	0.004	0.004	0.004	0.004
comm_17	-0.774	0.924	-0.840	0.402	0.011	0.008	0.010	0.012	0.008	0.011
comm_18	0.987	0.430	2.290	0.022	0.043	0.071	0.050	0.046	0.072	0.053
comm_20	-2.691	1.064	-2.530	0.011	0.065	0.004	0.050	0.036	0.004	0.028
comm_21	-1.945	0.677	-2.870	0.004	0.063	0.013	0.051	0.066	0.013	0.053
comm_22	1.194	0.454	2.630	0.009	0.034	0.096	0.049	0.032	0.097	0.048
comm_23	-1.102	0.539	-2.050	0.041	0.059	0.025	0.051	0.059	0.025	0.051
comm_24	-1.174	0.795	-1.480	0.140	0.027	0.008	0.022	0.027	0.008	0.023
_cons	-1.150	0.867	-1.330	0.185						
No. of obs	955									
LR chi2(54)	234.8									
Prob > chi2	0.000									
Pseudo R2	0.220									
Log likelihood	-416.6									

Table A5.5. *Description of variables used in Table A5.1 to A5.5*

Variable name	Description
maxedur1	Maximum years of schooling in the household
border	Birth order in ascending order
dmale	Dummy for boys (1 if boy and 0 if girl)
ai18	Asset index for 8-year-olds (Round 1)
wi18	Wealth index for 8-year-olds (Round 1)
depen	Number of family members below 7 and above 65 years old
ch7to17	Number of children between the age of 7 and 17 years
nbn17_65mr1	Number of male family members >17 and less than 65 years
nbn17_65fr1	Number of female family members >17 and less than 65 years
ddillnesr2	Dummy for death or illness since 2002
dtheftr2	Dummy for being attacked by theft since 2002
dinputpr2	Dummy for increase in input price since 2002
dpricer2	Dummy for increase in input price since 2002
dcattler2	Dummy for death of owned livestock since 2002
dcropfr2	Dummy for drought crop failure and pests and diseases since 2002
dnewhhr2	Dummy for addition of new household member or birth since 2002
dndisr2	Dummy for natural disaster including drought since 2002
	Square and interaction variables
ai182	square of ai18
wi182	square of wi18
Asaw	ai18 X wi18
Wdepn	wi18 X depn
Asdepn	as18 X depen
w7to17	wi18 X ch7to17
w17to65m	wi18 X nbn17_65mr1
w17to65f	wi18 X nbn17_65fr1
wdcropfr2	wi18 X dcropfr2
wdcattler2	wi18 X dcattler2
wddillnesr2	wi18 X ddillnesr2
a7to17	ai182 X ch7to17
a17to65m	ai182 X nbn17_65mr1
a17to65f	ai182 X nbn17_65fr1
adcropfr2	ai182 X dcropfr2
adcattler2	ai182 X dcattler2
addillnesr2	ai182 X ddillnesr2
Comm._1 to Comm_24	Community dummies
_Cons	Constant

Young Lives is an innovative long-term international research project investigating the changing nature of childhood poverty.

The project seeks to:

- improve understanding of the causes and consequences of childhood poverty and to examine how policies affect children's well-being
- inform the development and implementation of future policies and practices that will reduce childhood poverty.

Young Lives is tracking the development of 12,000 children in Ethiopia, India (Andhra Pradesh), Peru and Vietnam through quantitative and qualitative research over a 15-year period.

Young Lives Partners

Young Lives is coordinated by a small team based at the University of Oxford, led by Jo Boyden.

Ethiopian Development Research Institute, Ethiopia

Centre for Economic and Social Sciences, Andhra Pradesh, India

Save the Children – Bal Raksha Bharat, India

Sri Padmavathi Mahila Visvavidyalayam (Women's University), Andhra Pradesh, India

Grupo de Análisis para el Desarollo (Group for the Analysis of Development), Peru

Instituto de Investigación Nutricional (Institute for Nutritional Research), Peru

Centre for Analysis and Forecast, Vietnamese Academy of Social Sciences, Vietnam

General Statistics Office, Vietnam

The Institute of Education, University of London, UK

Child and Youth Studies Group (CREET), The Open University, UK

Department of International Development University of Oxford, UK

Statistical Services Centre, University of Reading, UK

Save the Children UK (staff from the Rights and Economic Justice team in London as well as staff in India, Ethiopia and Vietnam).

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