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# EVALUATING PUBLIC WORKS PROGRAMS' IMPACT ON CHILDREN'S OUTCOMES

Further evidence from the PSNP in Ethiopia

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## ABSTRACT

Ethiopia is one of the fastest growing economies in Africa, but poverty in the country is still widespread. Food crisis and acute malnutrition are among Ethiopia's most pressing issues. This paper deals with the most recent food policy program in the country and the second largest of its kind in Africa: the Productive Safety Net Programme (PSNP). The PSNP aims to improve the livelihoods of the poor by offering pay for work to the poorest households in rural areas. This paper explores the mechanisms through which the PSNP affects children's development and provides new evidence on the program's impact in the medium term on child nutrition, schooling and unpaid labour. To that end, I exploit data from the four rounds of the Young Lives Surveys spanning 2002-2013 and use a difference-in-differences estimation strategy to establish a causal nexus between the program and the outcomes observed. The resulting estimates are statistically insignificant, which suggests that even if the PSNP has a positive effect at the household level, these gains are not translating into improved child nutrition nor are they altering children's time allocation. The analysis here presented is limited by the fulfilment of the parallel trend assumption between treatment and control groups and by the comparability of the proposed control group.

**Key words:** social protection, safety nets, PSNP, Ethiopia, impact evaluation, child development

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## ABBREVIATIONS AND ACRONYMS

|         |   |
|---------|---|
| BDH     | Bono de Desarrollo Humano                                 |
| CCT     | Conditional Cash Transfers                                |
| CSA     | Ethiopia's Central Statistical Agency                     |
| CT      | Cash Transfer   |
| CTP     | Cash Transfer Program                                     |
| DID     | Difference-in-differences                                 |
| DS      | Direct Support  |
| DSP     | Direct Support Program                                    |
| FSP     | Food Security Program                                     |
| GDFRE   | Government of the Federal Democratic Republic of Ethiopia |
| HABP    | Household Asset Building Programme                        |
| HAZ     | Height-for-age z-scores                                   |
| HH      | Household   |
| LEAP    | Livelihood Empowerment Against Poverty                    |
| MGNREGA | Mahatma Gandhi National Rural Employment Act              |
| MOARD   | Ministry of Agriculture and Rural Development             |
| NCFSE   | National Coalition for Food Security                      |
| OFSP    | Other Food Security Programme                             |
| PSNP    | Productive Safety Net Programme                           |
| PW      | Public Works  |
| PWP     | Public Works Program                                      |
| SNNP    | Southern Nations, Nationalities and Peoples               |
| TLU     | Tropical Livestock Units                                  |
| TOC     | Theory of Change  |
| UCT     | Unconditional Cash Transfers                              |
| UN      | United Nations  |
| UNICEF  | United Nations International Children's Emergency Fund    |
| YL      | Young Lives   |
| YLPD    | Young Lives Panel Dataset                                 |

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# 1 INTRODUCTION

Social protection programs have been at the centre of the policy development agenda for more than a decade now. Worldwide, international organizations have taken the lead actively promoting their adoption: in 2009, the UN launched its Social Protection Initiative and that same year, the African Union established a Social Protection Framework, which calls on members to endorse a social protection strategy. Social protection is seen as an economic tool, as it is believed to contribute to the attainment of sustainable inclusive growth and to the eradication of poverty, but most importantly, it is also seen as a basic human right (Dessalegn, Pankhurst, & van Uffelen, 2013; UNICEF, 2009).

Social safety nets are a popular form of social protection. Their goal is to redistribute resources to alleviate shortages or transitory deficiencies among the most vulnerable. They have been widely implemented across Latin America, Africa and Asia, following the change in mentality in the development discourse whereby focus was shifted away from economic well-being to social well-being. A vast amount of resources has been invested in these social protection schemes, motivating evaluators to try to find scientific evidence of their effectiveness. As a result, extensive studies have been carried out – with overall positive results - by Baird, McIntosh and Özler (2011) who study Cash Transfer Programs (CTPs), by Subbarao, del Ninno and Milazzo (2009), who focus on Public Works Programs (PWPs), by Fiszbein and Schady (2009), who review Conditional Cash Transfers (CCT) for the World Bank and by UNICEF-ESARO (2015) who study social programs implemented in Africa. These reports look at the programs' impact on a broad range of matters such as food security, household consumption, education, targeting efficiency, sexual behaviour or network effects. Some of the relevant examples of programs reviewed include the Progresa program in Mexico, the Bolsa Familia program in Brazil, the Juntos program in Peru, the Livelihood Empowerment against poverty (LEAP) program in Ghana or the Productive Safety Net Programme (PSNP) in Ethiopia. This paper concerns over the latter, the PSNP, which is the second largest safety net program implemented in Sub Saharan African.

The PSNP was implemented in Ethiopia back in 2005 with the main goal of addressing its food insecurity problem. Africa is a region that has historically been

famine-prone, but Ethiopia stands out among the rest of its counterparts for being one of the most food-insecure countries. The reasons behind this phenomenon can be traced back to its harsh climate conditions and to its authoritarian regime (Sen, 1999). The PSNP was devised after 2003, when a terrible drought devastated the country. It was designed to be embedded in a longer term development strategy, replacing previous short-term food aid programs and introducing new elements such as the predictability and timeliness of the transfer payments. Since 2005, the PSNP has reached almost 10M people in 8 out of the 10 regions of Ethiopia. The program incorporates two distinctive components: the Public Works (PW) component, which offers public employment to households with able-bodied members and the Direct Support (DS) component which targets the poorest and most vulnerable households, with no able-bodied members.

Given its size and importance, the PSNP has already attracted the attention of some scientific evaluations. Authors have found that the PSNP has had an overall positive effect in the country (see for example, Filipski et al. (2017) or Berhane et al. (2014)). However, evidence of the impact of the program on children is mostly mixed. This is not a problem specific to Ethiopia: in general, PWPs have been criticized for its possible negative consequences on children. According to these critics, PWPs are designed to benefit the population at the household level, which means that their effect on intrahousehold dynamics is not incorporated as a concern in their policy design. Moreover, it is often assumed that if households are benefited as a whole, so will be every member of the family. Authors who disagree with this assumption have called on the need for further evidence on this respect, as they underline that there exist some pathways through which the program can negatively affect individuals within the family (mostly females and children). For instance, Streuli (2012) argues that girls, as parents leave to work in PWs, are required to spend more time at home taking responsibility for care-giving activities such as overseeing their siblings or cooking for the family.

I contribute to this body of literature by assessing the impact of the PW component of the PSNP on children's nutrition (as measured by height-for-age z-scores<sup>1</sup>), schooling (as measured by time spent doing school-related activities) and labour outcomes (as measured by time spent doing unpaid labour). Impact on height-for-age z-scores has been

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<sup>1</sup> Height-for-age z-scores is a widely used proxy of stock child health in health research literature

previously studied by Berhane, Hoddinott, & Kumar (2017) and by Porter and Goyal (2015), but both studies have arrived to contradicting conclusions. Impact on time spent in school or studying was also assessed by Tafere and Woldehanna (2012), but their analysis only follows PSNP participants four years after the implementation of the program. Impact on child unpaid labour was evaluated by Tafere and Woldehanna (2012) and by Berhane et al. (2017), but their analysis again provides opposite results. This paper aims to shed light on these issues by providing new evidence, hence contributing to this gap in the literature about the PSNP's impact on children. To that end, I use the Young Lives Panel Dataset (YLPD), part of the Young Lives Initiative - an international study of the determinants and consequences of childhood poverty -, which covers a study of children in Ethiopia in four different phases (2002, 2006, 2009 and 2013). The first roll out of the PSNP falls nicely in between the first two phases. I leverage on this circumstance to evaluate the impact of the program following a difference-in-difference strategy, as has been done similarly by Escobal and Benites (2012) and Hossain (2015) to evaluate safety nets in Peru and India respectively. I find that impact estimators are statistically insignificant, which suggests that participation in the program might not be having an effect on children's nutrition, schooling or child unpaid labour. However, the validity of these results relies on the assumption of the parallel trends and the appropriate construction of the control group.

The rest of the paper is organized as follows. Next, I expand further on the motives and relevance of this paper. Then, I present the main existing evidence on CCTs and PWP's impact on children outcomes and on the impact of the PSNP. Section four lays out the Theory of Change and discusses the pathways under which the program might have an effect on children. Section five presents the research question and the goals of this paper. Section six discusses the data and the empirical strategy used for the analysis. Section seven presents the main analysis and the interpretation of the results that this paper arrives to. Finally, section eight concludes and ends the paper with some proposals for further research.



## 2 INTRODUCTION TO SAFETY NETS AND MOTIVES OF THE STUDY

### 2.1. What is social protection and why should governments pursue it?

In order to establish common ground on what social protection constitutes, I use the definition introduced by Devereux and Sabates-Wheeler (2004, p. 9), which has been frequently used by other authors. They define social protection as “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”. The main elements obtained from this definition are the following: (1) both institutional arrangements and those which are provided by non-governmental bodies can be considered to be social protection; (2) some kind of assistance has to be transferred to the poorest individuals; (3) the main objective must be to improve their livelihood and social well-being (note how it is not economic but *social* protection) and to reduce their vulnerability.

But, why should governments implement social protection programs? Social protection is one of the tools governments can use to protect the well-being of the vulnerable from the inefficiencies of the market, from economic inequalities or from the instabilities of the economic cycle. The most solid theory addressing this question is that of “development as freedom”, proposed by Nobel Prize winner, Amartya Sen. In his renowned book, Sen (1999) claims that there are six instrumental freedoms that allow people to live more freely. Development policies, he argues, should work towards the expansion of these freedoms, and not towards other objectives such as economic growth. The last of these freedoms is the *protective security*, which “is needed to provide a social safety net for preventing the affected population from being reduced to abject misery, and in some cases even starvation or death” (p. 40). Sen reasons that these institutional arrangements are essential in preventing the poor from extreme deprivation and as such, they become an instrumental freedom that guards the “protective security” of the most vulnerable. Additionally, social protection programs can also be used by governments to

boost the resilience of those who have fallen into poverty in times of hardship and help poor households in their investment and risk management decisions (Grosh, del Ninno, Tesliuc, & Ouerghi, 2008).

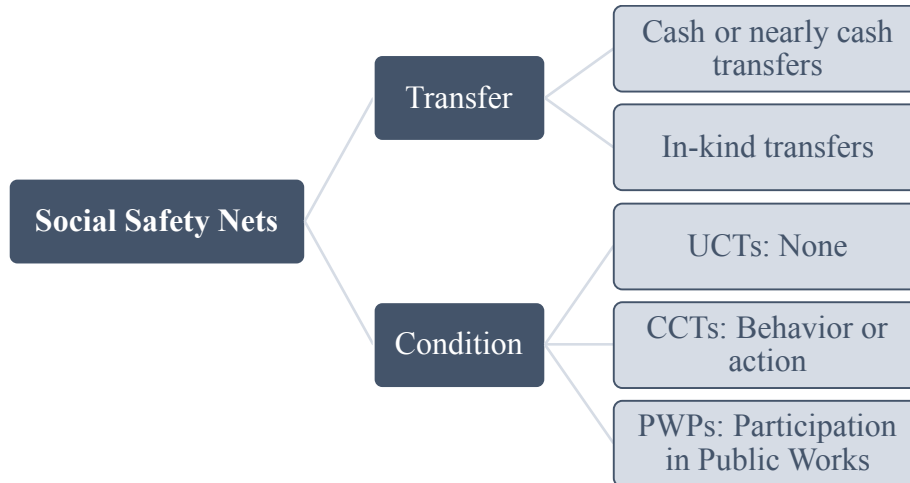
## 2.2. What types of social protection programs exist?

According to Gentilini and Omamo (2011), social protection includes three different components: labour policy and insurance, social sector policy and social safety nets (see figure A.1. in Appendix). It is the last of these components, the safety nets, that are seen as a crucial element of today's poverty alleviation strategy and that I will expand further on presently. "Social safety nets" or "social assistance", as seen elsewhere, are "non-contributory transfer programs targeted in some manner to the poor or vulnerable" (Grosh et al., 2008, p. 463). Labour, insurance and social sector policies will not be further studied in this paper.

There are a broad range of social safety net programs. Based on Grosh et al. (2008), in figure 1, I propose a typology for grouping them. First, programs can be catalogued based on the type of transfer provided, be it cash or near cash benefits such as vouchers or stamps (e.g. Progresa in Mexico) or be it in-kind transfers such as food or general subsidies (e.g. some of the beneficiaries of the PNSP in Ethiopia). In addition, the programs can also be categorized according to the conditions incorporated in the transfer. As such, we can find Unconditional Cash Transfers (UCTs), where the transfer is subject to no conditions (e.g. Bono de Desarrollo Humano in Ecuador); Conditional Cash Transfers (CCTs), where the beneficiary has to behave in a desired manner - such as receiving medical check ups or sending kids to school regularly - in order to receive the payment (e.g. Progresa in Mexico); and Public Work Programs (PWPs), income generating programs in which beneficiaries are provided with public employment in exchange of a predetermined wage for a given period of time (e.g. Mahatma Gandhi National Rural Employment Act in India). Following this framework, the PSNP is categorized as a social safety net that transfers cash, food or a combination of both; with two different modalities regarding the conditions implied. For the great majority, transfers require beneficiaries to be employed at public works (PW component) and for a small minority, the transfer is directly delivered with no conditions attached (DS component).

For the purpose of this study, and given that PWPs have been much less studied, I will focus on the first component of the PSNP.

Figure 1. Social Safety Nets Typology



Source: author's own elaboration based on Grosh et al. (2008)

### 2.3. Is more evidence really needed?

Evidence-based policy has become the mainstream discourse in policy design. But, why should public policies be evaluated? The answer is not as obvious as it seems, given that for decades, public policies have been implemented with no evaluation mechanism in place. Despite the vast amount of resources invested in poverty alleviation programs, extreme poverty, low productivity and labor activities in the primary sector are still widespread throughout Africa. This is because policy-making has been for years guided by inertia, ideology and ignorance (Banerjee & Duflo, 2011), but also because even good-intentioned policies can fail. The main benefit of evaluating is that well-done and rigorous evaluations allow researchers and policy-makers to know if a program has had a positive effect on the targeted population and if it has reached its stated goals. If it has indeed worked, they can either continue to implement it, scale it to a larger population or replicate it elsewhere. As a consequence, it is expected that only efficient programs will remain and that the fight against poverty will be more successful than it has been to date.

The main challenge of evaluating social programs is that assessing their impact is not straightforward. An ideal impact evaluation would compare what happened to the

targeted population after the program was implemented to what would have happened to that same targeted population in that same moment, but in an “imaginary case” in which they wouldn’t have received the program (i.e. the counterfactual). Obviously, data for this latter situation (which never occurs) cannot be gathered. This is what is called the fundamental problem of causal inference (furthered explained in Section 6.2.). Other challenges include the improvement of data collection and strict monitoring systems (Monchuk, 2014).

As introduced in the first section, many studies gather the existing evidence on safety nets’ effectiveness. However, PWPs have been far less studied than CCTs, with particularly few studies focusing on their impact on children. Because PWPs are usually designed to have a positive impact at the household level, there are good reasons to believe that they may have unintended consequences on children. This is alarming given that vulnerability is more acute among children because the long-term consequences of economic shocks may hamper their ability to catch up in older ages. PWPs seem to contribute to sustainable growth and to act as a cushion in times of emergency; but, are they hurting children? This study aims to shed some light on the issue, to contribute to the mixed existing evidence and to disentangle the pathways through which the PSNP affects children’s outcomes. Hence, I believe my conclusions can be useful to understand current programs and to redesign future similar programs to protect children’s well-being.

## 3 RELEVANT RESEARCH AND LITERATURE REVIEW

### 3.1. The Productive Safety Net Programme

#### 3.1.1. Context

Ethiopia is one of the most food-insecure countries in the world. It is prone to suffering from devastating famines and chronic food shortages and still today, food crisis and acute malnutrition are among the country's most pressing problems. Since 2015, Ethiopia experiences its worst drought in recent history and more than 10 million people, or almost 10% of the country's population, are estimated to be in need of some kind of emergency food assistance (World Food Programme, 2016).

In spite of its history of food crisis, the Ethiopian government did not establish food security as a policy concern until the 1970s, when the food security problem started to attract the attention of the public policy discourse. Since then, a series of initiatives have been set up to respond to these food crisis (Dessalegn et al., 2013), but all of them were introduced on an ad-hoc basis, addressing the problem in a reactive and short-sighted manner.

The beginning of the 21<sup>st</sup> century brought about the recognition that previous interventions had failed to tackle Ethiopia's food security problem. Moreover, the literature started to recognize that poverty in Ethiopia was deeply entrenched in its food insecurity problem, hence calling for a more sustainable answer that would also contribute to the national poverty reduction effort. Specifically, it was after the drought of 2002/2003, that it finally became clear that Ethiopia was trapped in a cycle of recurrent food emergency crisis and that public interventions needed to be reoriented into a new long-term strategy (Kebede, 2006). In 2003, the National Coalition for Food Security (NCFSE) and its Food Security Program (FSP) were formed. The PSNP was devised as part of this comprehensive framework and was the key intervention established by the FSP, along with the Other Food Security Programme (OFSP), later redesigned into the Household Asset Building Programme (HABP)<sup>2</sup> (Dessalegn et al., 2013).

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<sup>2</sup> The HABP aims to maximize income generation given household current capacities through the provision of access to credit and agricultural technical assistance among others.

### 3.1.2. How does the PSNP work?

The PSNP is the largest social protection scheme implemented in sub-Saharan Africa outside of South Africa. It was first launched in April 2005 and has since been rolled out in four different phases.<sup>3</sup> The program has reached to date almost 10M people in more than 300 chronically insecure *woredas* (Ethiopian districts) mostly in rural areas in 8 out of 10 regions (see figure A.2. in Appendix)<sup>4</sup>. The program's cost is estimated to be at around US\$500 million per year (Berhane, Gilligan, Hoddinot, Kumar, & Teffesse, 2014).

The PSNP is configured mainly as a Public Works Programs, following previous patterns that show that emergency employment programs have been commonly used to address famines (Sen 1999, p. 169). To understand why this type of social programs has been widely used in food insecurity contexts it is useful to look at why do famines happen and what their consequences are. Famines may occur due to a number of factors: increases in food prices, high and persistent unemployment or declines in food production as a result of natural disasters (i.e. floods or rainfalls) or of failed harvests. Their consequences are usually severe, ranging from acute under nutrition, premature death, increased incidence of preventable illnesses, decreased productive capacity or asset depletion. PWPs rely on the assumption that a resource transfer will help poor households build resilience and cope with these adverse shocks.

Specifically, a major problem occurring during food deficit periods in Ethiopia is that ultra-poor households, to meet their basic nutritional needs during these crisis, are forced to sell their productive assets in order to earn extra income. Therefore, these recurrent shocks act as poverty traps and prevent these families from escaping extreme poverty<sup>5</sup>. The PSNP tries to prevent this by providing “transfers to the food insecure population in chronically food insecure *woredas* in a way that prevents asset depletion at the household level and creates assets at the community level” (GFDRE, 2004).

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<sup>3</sup> Phases 1 and 2 were implemented from 2005 to 2010, Phase 3 was implemented from 2010 to 2015 and Phase 4 is currently undergoing (from 2015 to 2020).

<sup>4</sup> The regions where the PSNP operates are Afar, Amhara, Dire Dawa, Harare, Oromiya, Southern Nations, Nationalities and Peoples (SNNP), Somali and Tigray.

<sup>5</sup> See Banerjee & Duflo (2011, p. 9) for more detailed information on poverty traps.

To illustrate this mechanism through a simple example, we may imagine a poor household that has finally managed to accumulate enough savings to buy a goat. This investment, they expect, will allow them to generate additional income, mainly through milk production. However, during the last summer, there were heavy rainfalls which led to many farmers losing much of their harvest. As a result, staple food at the market is now very expensive and the household finds itself in an urgent need of cash. With sorrow, they resort to selling their recently bought goat as a coping mechanism. And that is, in brief, how asset depletion works. The testimony of a woman in the *woreda* of Chiro found in Devereux et al. (2008) explains how the PSNP can prevent this type of situations. She argued that “because of the safety net programme, you don’t sell the goat that is in front of you. Instead you are eating with help from the government”.

According to the Ministry of Agriculture (2004)<sup>6</sup>, a *woreda* will be considered chronically insecure if it is in one of the 8 chosen regions and has received food aid for at least each of the previous three years. Back in 2005, this resulted in the election of 262 *woredas*<sup>7</sup> across the country. Similarly, a household is considered chronically insecure if it is in a chronically food insecure *woreda*, has faced continuous food shortages (as evaluated by a mix of administrative guidelines and community knowledge) and has previously received food assistance or has no other kind of social support and protection. An interesting feature of the PSNP is that decisions on who the beneficiaries of the program are (this is, which households are considered food insecure) is done by existing *woreda* public institutions, with the support of the *kebeles* (Ethiopian equivalent to a sub-district): community rankings of the households that are most in need are drafted and thereafter discussed during public meetings. With this selection system, combined together with the distribution of targeting and implementations manuals, the PSNP places a strong emphasis on transparency and accountability.

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<sup>6</sup> See the Programme Implementation Manual (Ministry of Agriculture, 2014) for a detailed description of the targeting principles of the PSNP.

<sup>7</sup> The number of *woredas* participating in the program has increased over the different phases, and is now at over 300.

Table 1. Characteristics of the PSNP

|                                     |  |
|-------------------------------------|--|
| <b>Start Date</b>                   | April 2005   |
| <b>Geography covered in Phase I</b> | 262 <i>woredas</i> across the regions of Afar, Amhara, Dire Dawa, Harare, Oromiya, Southern Nations, Nationalities and Peoples (SNNP), Somali and Tigray |
| <b>Structure</b>                    | HH with adult labour: food or cash for participating in Public Works<br>HH with no adult labour: food or cash as Direct Support                          |
| <b>Objective</b>                    | Preventing asset depletion at the household level and creating assets at the community level, in chronically food insecure <i>woredas</i>                |

Source: author's own elaboration

### 3.1.3. PSNP Features

The PSNP is configured in an innovative way that gathers and implements the learnings on the design of safety nets found in the literature. The following three elements, aside from its size, make it a particularly interesting case of study.

First, the PSNP avoids creating dependency among beneficiaries. To do so, it combines two basic modalities (see table 2 for details):

- (1) For households with able-bodied adults (older than 18 years), resource transfer is conditional on them participating in Public Works. Resource transfers can either be in the form of cash, food or a combination of both (see figure 2). This modality aims to contribute to the building of assets at the community level, with participants working in projects such as those related to soil and water conservation, to prevent the negative consequences of adverse climate conditions, and those related to the construction of community infrastructure like rural roads, schools or clinics. The value of PSNP transfers has increased throughout time to respond to the global increase in food prices. Wage rate was fixed at the beginning of the program at 6 Birr per day or 3 kilograms of grain, increased to 8 birr in 2008 and to 10 birr in 2010. This compensation is intentionally below the market wage rate, in the hope that less needy households will be discouraged from applying to the program (Berhane et al., 2014). Finally, most Public Works are done during peak farming periods between the



months of May and August. This is also called the “lean period”, or the time between the harvesting and the planting seasons, when food shortages take place.

- (2) For the households with no able-bodied members (for example, those headed only by elders, pregnant or nursing women or people with some kind of handicap that prevents them from undertaking heavy work), direct support with no conditionality is granted. The latter only accounts for around 15% of all PSNP resource transfers (Favara, Porter, & Woldehanna, 2017).

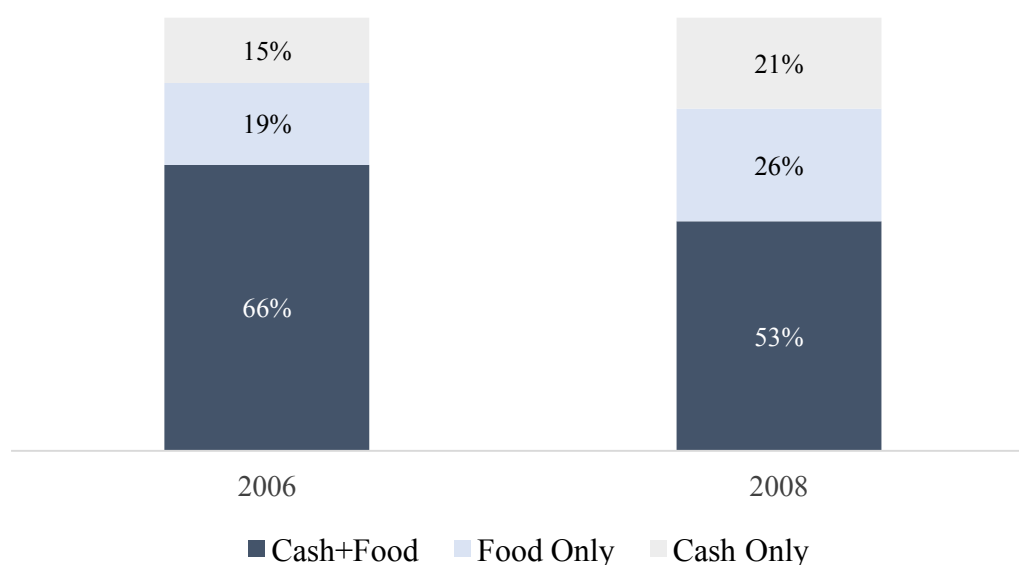
*Table 2. Characteristics of PSNP HH participants and non-participants (Phase 1)*

|                                    | Direct Support | Public Works | Non PSNP Households |
|------------------------------------|----------------|--------------|---------------------|
| <b>Annual HH income (in birr)</b>  | 690            | 1,597        | 1,949               |
| <b>Total Asset Value (in birr)</b> | 320            | 846          | 1,471               |
| <b>HH owing land (in %)</b>        | 75.4           | 88.8         | 88.2                |

Source: Devereux, Sabates-Wheeler, Tefera and Taye (2006)

Note: HH stands for household

*Figure 2. Breakdown of the type of resource transferred to PSNP participants (2006 -08)*



Source: Ethiopian Ministry of Agriculture (2014)

Second, the PSNP places a strong emphasis on predictability and timeliness. As such, it is an example of the evolution in policy making from a humanitarian to a development approach, this is, from a short-term reactive approach, to a long-term preventive one<sup>8</sup>. This relates to two main findings in recent literature. First, that social protection is expected to be embedded in a long-term strategy in order to be an effective contribution to the economic development and the poverty reduction efforts of the country (Dessalegn et al., 2013). Second, that in Ethiopia, there are not only people “at risk” of famines, as it was considered in previous policies, but people who are impoverished as a result of their constant struggle to meet their food needs (Devereux et al., 2008). To account for these findings, the PSNP features predictable transfers for 6 months every year, for a period of 5 years.

Third, the PSNP addresses some of the underlying causes of food insecurity. As its name indicates, the PSNP is a *productive* safety net. On one hand, the government seeks to improve the livelihood of its population by improving the productive context in which their economic activities unfold. It hopes to tackle the food insecurity problem not only by providing transfers, but also by indirectly contributing to asset protection and income generation. To that end, its PW element is also expected to contribute to the economic growth of the region (for example, by building roads which can make it safe for children to go to school) and to further create a multiplier effect on its resource transfer. On the other hand, and unlike previous food-for-work programs, the PSNP sees graduation from the program as a core objective. Households graduate from the program when food sufficiency is attained, this is, when they are able to meet its food needs for 12 months without the support of PSNP transfers. By 2012, 500,000 households had already graduated from the program (Berhane et al., 2014).

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<sup>8</sup> For a good paper on this shift of mentality in the issue of food security, see Kebede (2006)

## 3.2. Literature review

### 3.2.1. Impact of social safety nets on children's outcomes

The impact of social safety nets on children has been central to many evaluations across the globe, with mixed evidence of their impact. Authors study impact on indicators that range across health outcomes (e.g. immunization rates, incidence of preventable diseases, nutritional status), schooling outcomes (e.g. mean years of schooling, school enrolment), cognitive outcomes (e.g. vocabulary test, long-term memory) and labour outcomes. Most of the impact evaluations have been carried out of Conditional Cash Transfers, which, with a few differences, have been considered akin to Public Works Programs in many ways. That is why I will first review the existing evidence of the most relevant CCTs and I will thereafter review that specific to PWPs.

#### *The impact of CCTs on children's outcomes*

Latin American was the first region to widely incorporate CCTs into its development agenda (Fernald, Gertler, & Neufeld, 2008). The most well-known social protection programme is an intervention called Oportunidades (formerly Progresá), first implemented in Mexico in 1998 with the objective of breaking intergenerational transmission of poverty. The program is a CCT that targets 506 randomly selected Mexican low-income communities and that includes two types of transfers: a monthly stipend conditional on receiving preventive medical care and an educational scholarship conditional on children attending school a minimum of 85% of the school year (Fernald et al., 2008). Given its success, the model has been widely replicated elsewhere.

Rivera, Sotres-Alvarez, Habicht, Shamah and Villalpando (2004) focus on the nutritional component of Oportunidades and find evidence that the program improved child height by 1.1cm but only for those children who were 6 months when the intervention started and who came from the poorest families. This study contributes to the body of literature that argues that programs have a different effect on children of different age groups and that in order to avoid the long-term consequences of childhood poverty, it is crucial that programs target children in their very early ages. Fernald et al. (2008) study the program's impact on children well-being, isolating the cash component

and excluding the conditional element. They show that Oportunidades had a positive impact on children's health outcomes (as measured by height-for-age z-scores, haemoglobin concentration, prevalence of stunting and prevalence of overweight) and cognitive outcomes (as measured by vocabulary, abilities tests and working memory). To assess this impact, they exploit the time-lag of incorporation of a second badge of households, for whom participation in the program was delayed 18 months due to budgetary constraints.

Similar evaluations have been carried out for programs implemented in Peru and Ecuador. In Peru, the government introduced in 2005 the program JUNTOS, a CCT that transfers monthly payments to household beneficiaries, subject to three conditions: children younger than 5 years have to undergo several medical check ups that provide vaccinations or vitamins supplements; children between the ages of 6 and 14 have to attend school at least 85% of the school year; and finally pregnant or nursing women also have to undergo medical check ups (Gahlaut, 2011). As can be seen, with some minor variations, JUNTOS was conceived to closely replicate Oportunidades.

Escobal and Benites (2012) use the YLPD, which is also implemented in Peru, to assess the impact of the program in children's schooling and nutritional outcomes. The only significant impact they find (results are significant at 1% level) is a decrease in paid labour. However, they also detect an increase among children of time spent doing unpaid labour (i.e. household chores), which translates into an unchanged amount of time dedicated to school. Gahlaut (2011) finds similar results: a reduction in child labour but virtually no effect on school enrolment. He also finds no significant impact on the studied health outcomes. Streuli (2012) uses a qualitative study of children between the ages of 6 and 14, based on the collection of primary data through different methodologies ranging from social mapping to interviews. The author presents further evidence on the effectiveness of such programs on children's school attendance, but also draws attention on the unintended consequences of the program for women. Specifically, she presents evidence that the program is reinforcing the role of female-heads as care-givers (as opposed to male-heads being income earners), and that children participating in JUNTOS feel a stronger pressure to do well in school.

In Ecuador, a different type of social safety net was implemented by the government back in 2003. The Bono de Desarrollo Humano (BDH) was a Cash Transfer Program that differed from Oportunidades and JUNTOS in two essential ways. First, transfers were made with no strings attached (this is, conditionality was removed from the program), giving rise to an opportunity to discern if the conditionality element is effective in such programs. Second, transfers were channelled explicitly through the female-head in the household. This is interesting because many studies have discovered that the gender of the recipient matters and that women have different preferences to those of men, hence spending the cash received in a different manner (supposedly, more on their children and on “family-friendly” matters). They claim that these differences will lead to an increase in efficiency and to better outcomes<sup>9</sup>.

According to Paxson and Schady (2007), the BDH had a positive effect on health (as measured by fine motor control, which they predict to be 16% of a standard deviation higher among program participants) and development (as measured by long-term memory, which they predict to be 19.2% of a standard deviation higher among program participants) of rural children aged 3 and 7. They find that these effects are significantly larger for children coming from the poorest families. The authors suggest that the mechanisms underlying these gains are better nutrition, rather than improvements in health care or better parenting. They draw these conclusions from surveys in which women receiving the transfers reported spending the cash mostly on food, and indicated that it was them and not their husbands making the decisions on how cash should be spent.

### *The impact of PWP on children's outcomes*

PWPs differ from CCTs in that beneficiaries are employed in public works and in turn receive a cash or food transfer. Thus, participants are made active agents in the improvement of their social and economic status, instead of being mere recipients of public support. Given that I will be evaluating the PW component of the PSNP, it is relevant to understand the evidence that has been found in similar programs abroad.

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<sup>9</sup> A new body of literature is being built around the issue of Cash Transfers Programs and gender. For an extensive study on the topic see Bastagli et al. (2016)

India has been home to many social protection initiatives, but perhaps one of its flagship interventions is the Mahatma Gandhi National Rural Employment Act (MGNREGA), the largest Public Works Program in the world. It started in 2005 and was ambitiously designed to eventually cover all rural districts across India. In addition, it is unique in that the program is accessible to any rural household that applies to it, instead of being restricted to households that meet a number of criteria, as it is the case in most of the studies mentioned in this paper. MGNREGA guarantees that all applicants are provided with at least 100 days of unskilled manual work (usually related to building and maintenance of community infrastructure) at a wage rate equal or higher than the legal minimum set by the state (Mani, Behrman, Galab, & Reddy, 2014). The MGNREGA differs from the PSNP mainly in its design and in its targeting strategy: while in India, participants have the right to participate in the program and it is them who choose to apply (every application is guaranteed participation in the program); in Ethiopia, participation depends on selection by Community consensus and on resource availability, which is limited by an imposed quota system. Despite these differences, lessons learnt from the MGNREGA may still be applicable to the PSNP, given that the mechanisms under which PWP affect children remain analogous. Therefore, I hereafter present the studies that have looked at the impact evaluations of the MGNREGA, with no encouraging findings on the betterment of children's well-being.

Uppal (2009) was the first to analyse the impact of the program on children. The author finds that effects on health outcomes (as measured by anthropometric scores) were negligible, but that the program significantly reduces the probability of both girls and boys taking up paid labour. Mani et al. (2014) use the YLPD to measure the effect of MGNREGA in children well-being both in the short and in the medium term. They extend the range of indicators measured to capture all the mechanisms through which the program may affect children well-being. As such, they find no effect on school enrolment, but strong positive effects (similar to those found in previous studies of CCTs in Latin America) on grade progression, reading comprehension and cognitive achievement in the fields of maths, writing, and vocabulary, being these improvements sustained in the medium run.

Hossain (2015) carries out a similar study but using a subset of the data and focusing on participants in the state of Andhra Pradesh given that it is one of the Indian states were

uptake of the program is highest. The author finds a largely insignificant effect of the program on the health and cognitive measures analysed and suggests as possible explanations that households may not be spending their extra income on food or school materials, or that MGNREGA may not lead to children being relieved from paid labour or household chores, hence not being benefited with the extra time that could have been employed for school-related work.

In Africa, Public Works Programs are common instruments used in poverty reduction strategies, being present in 38 out of 48 sub-Saharan countries (World Bank, 2015).<sup>10</sup> Aside from the PSNP, Malawi's large-scale Social Action Fund has also attracted the attention of many researchers. Nonetheless, most studies assess its impact on food security (see for example Beegle, Galasso and Goldberg (2015)) and not on children outcomes. To the author's knowledge, there are no other relevant studies of the effect of PWPs on children outcomes other than the ones cited in this paper.

### 3.2.2. Impact of the PSNP

Given its large scale and scope, the PSNP has been assessed on a number of outcomes. According to its outcome of interest, all these studies can be categorized in two different types: those studying impact at the system level and those assessing it at the household / individual level (see also table A.1. in Appendix for a summary).

#### *Impact of the PSNP at the system level*

In its evaluation of the third phase of the PSNP, the Ministry of Agriculture (2015) found that the program was contributing to mitigating climate change through a reduction in the CO<sub>2</sub> resulting from the adoption of new activities that promote carbon sequestration in soil and biomass. More recently, Filipinski et al. (2017), through a mix of quantitative and qualitative analysis, find evidence that the broader goal of the PSNP of stimulating local growth is being met. They show that the program has positive effects at both the micro level (they find statistically significant increases in grain and vegetable yields) and at the macro level (through economic modelling, they predict that program's spill overs

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<sup>10</sup> For an extensive review of the current existing evidence of the impact of Social Cash Transfers in Africa, see UNICEF-ESARO/Transfer Project (2015)

have far-reaching consequences, implying a multiplier effect that leads to country-wide economic stimulation).

### *Impact of the PSNP at the household / individual level*

Food security at the household level was first studied by Gilligan, Hoddinott and Taffesse (2008) only to find modest effects on participants 18 months after the intervention. A later study by Berhane et al. (2014) is able to assess the long-term effects of the PSNP on food security. They are interested in finding out if the increase in income resulting from the cash transfer translates into increased consumption or into increased asset accumulation. This is, what were PSNP households spending that extra income on? They find strong evidence of improvement in the number of months that participants reported being food secure (from 8.36 months prior to the intervention to 8.87 months in 2010; and a larger effect for households participating in the program for longer), and on reported livestock accumulation (from 3.38 Tropical Livestock Units (TLU)<sup>11</sup> prior to the intervention to 3.86 TLU in 2010). However, they find negligible impact in the amount of food consumed, although they argue this estimate might be erroneous due to recall error among survey respondents. Most interestingly for the purpose of this study is the growing amount of literature dedicated to assessing the impact of the PSNP on children, namely on health, labour and schooling outcomes.

Regarding health outcomes of the PSNP, evidence is mixed. Both Porter and Goyal (2016) and Berhane et al. (2017) study the impact of the program on individual children's nutritional status, as measured by height-for-age z-scores. They use different data sets and different methodologies to do so and end up with conflicting results. While the former finds that the PSNP has had positive nutritional effects on children from 5 to 15 years old, of similar magnitude to those found in CCTs in Latin America; the latter finds no evidence of reduced under nutrition and hypothesizes that these findings result from the poor quality of children's diet.

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<sup>11</sup> TLUs are measures of livestock holdings. For example, cattle, horses and mules equal 1 TLU while donkeys equal 0.65 TLUs.



Regarding child labour and schooling outcomes, Berhane et al. (2017) use a longitudinal survey implemented by Ethiopia's Central Statistical Agency (CSA) to look at grade attainment and hours worked per week on domestic tasks. They find unclear evidence as to what the effect of the program has been across different genders and ages, with some years experiencing a positive impact while others a negative one. Camfield (2014) looks specifically at how the PSNP impacts adolescent girls (and in the same paper replicates the analysis for the MGNREGA in Andhra Pradesh). Girls are exposed to suffering from potential unintended consequences of PWPs, given that they, to substitute their parents while away working at the Public Works, may have to increase their time spent undertaking domestic work. She argues that, as opposed to CCTs, PWPs always reinforce the role of girls as care-givers (as Streuli (2014) had warned on her study in Peru). For example, she shows that girls are reported to leave school to care for their siblings, cook meals for their family or do other similar domestic tasks.

Finally, I draw from the research of Professor Tassew Woldehanna, current President of Addis Ababa University, on the impact of the PSNP on children's outcomes, which is assessed using the Young Lives Panel Data and which has been updated every time a new round of the YLPD has been released. In his first study (2009), he assesses the program's impact on children's time use. He lays out his theoretical framework under which the PSNP has two opposing effects: the substitution effect (adults have to go to work, so children are demanded to carry out new chores either in or outside the household (e.g. taking care of the household cattle, child care chores...)) and the income effect (the household receives an income transfer, which provides them with enough financial resources to send their children to school). He uses propensity score matching techniques to determine that the PSNP on its first year led to children being more involved in both paid and unpaid work (time use increased by 0.13 hours) and less in childcare and household chores (time use decreased by 0.5 hours). In his second study (Tafere & Woldehanna, 2012), he finds an increase in the amount of hours that children spend doing both paid and unpaid labour, and no effect on time spent either in school or studying. In his last study (Favara et al., 2017), a small but significant effect is found on math skills, which is driven by households who have graduated from the program. This is hypothesized to be because children are receiving higher food intakes and spending more time at school.

## 4 CONCEPTUAL FRAMEWORK: PSNP THEORY OF CHANGE

### 4.1. What is a Theory of Change?

A Theory of Change (TOC) is a logical framework that is used for policy design and evaluation to link causes and effects. It outlines all the specific ways in which the program inputs have an effect on beneficiaries, and the activities and outputs that translate into the desired results. It also highlights the key conditions, assumptions and risks implied in the described logic (Gertler, Martinez, Premand, Rawlings, & Vermeersch, 2011).

TOC frameworks are becoming popular as a result of the increase in evidence-based policies. The focus of evidence-based policies is to identify if programs have indeed had the desired impact in the targeted population. However, it is even more essential for policy-design and policy-making purposes, to understand the underlying mechanisms through which these programs affect its intended outcomes. For example, take the BDH in Ecuador, which transferred money to the female-head in the households with no conditions. If it has a positive impact, how do we know if it is because the transfers had no conditions or because they were delivered to women? Or similarly, if no positive impact is found, how can it be explained? Do we immediately conclude that both programs with no conditions and programs directed to females are not effective? Disentangling which one of the two features of the program was effective – or if it was a combination of both - allows to successfully replicate, expand or create similar programs while maximizing efficiency and impact. Thus, the TOC, which helps understand pathways through which impact operates, is a key element for the transformation of current and the improvement of future public policies and is of extreme importance for policy makers. TOCs are also important for us researchers in that they remind us that research is not worthy in itself but only in its usefulness when translated into action.

### 4.2. How can the PSNP affect children's outcomes?

In table 3, I present a TOC for the PSNP, which I elaborate drawing from previous studies on PWPs (mainly Woldehanna, 2009; Gahlaut, 2011; Hossain, 2015).

Table 3. Theory of Change of the PSNP

|                 | Context  | Inputs   | Outputs  | Outcomes   | Direct Impact  | Child Impact   |               |
|-----------------|--|--|--|--|--|--|---------------|
| PSNP            | <ul style="list-style-type: none"> <li>-Long history of nearly annual food crisis in the country</li> <li>-Almost 14 Million people affected by the 2002 drought</li> </ul>  | <ul style="list-style-type: none"> <li>- The PSNP is laid out and beneficiaries are chosen through public discussion at the <i>woreda</i> and <i>kebele</i> levels</li> <li>- Public Works are made available for program beneficiaries</li> </ul>   | <ul style="list-style-type: none"> <li>- HH are aware of the existence of this new program</li> <li>- Program beneficiaries take up public employment offered by the PSNP</li> </ul>                     | <ul style="list-style-type: none"> <li>- HH receive transfers of cash or food and increase their purchasing power</li> </ul>   | <ul style="list-style-type: none"> <li>- HH increase their food intake</li> <li>- Children attend school more</li> <li>- HH environment improves</li> </ul>  | <ul style="list-style-type: none"> <li>- Children nutritional status improves</li> <li>- Children cognitive abilities improve</li> <li>- Children well-being improves</li> </ul>   | Income effect |
|                 |  |  |  | <ul style="list-style-type: none"> <li>- HH able-bodied members spend less time at home</li> </ul>   | <ul style="list-style-type: none"> <li>- Children spend more time at home</li> <li>- Parents reduce monitoring of children's activities</li> </ul>   | <ul style="list-style-type: none"> <li>- Children spend less time on educational activities</li> <li>- Children schooling outcomes deteriorate</li> </ul>  | Time effect   |
| Key Assumptions | <ul style="list-style-type: none"> <li>- A substantial proportion of the rural population are poor and highly vulnerable</li> <li>- The government can ensure the supply of the funding amount required for the programme</li> </ul> | <ul style="list-style-type: none"> <li>- The government and its implementing partner organizations make an efficient use of the funds and resources</li> <li>- The targeting system works in an efficient manner and only poor households benefit from the programme (no elite capturing)</li> </ul> | <ul style="list-style-type: none"> <li>- HH make rational decisions concerning the use of the transfers</li> <li>- Public Works benefit communities from an economic and social point of view</li> </ul> | <ul style="list-style-type: none"> <li>- Payments are made at the established timings and amounts on a regular basis</li> <li>- Travelling to the assigned locations to receive payments is not subject to as many dangers as to deter participants from receiving payments</li> </ul> | <ul style="list-style-type: none"> <li>- HH who receive cash buy more food</li> <li>- HH who receive food consume it and do not resell it</li> <li>- Lack of sufficient income was the only barrier stopping children from going to school</li> <li>- Income constraint caused a rise in stress levels within the HH</li> <li>- Adults leaving the house to participate in PWs alters children's time distribution</li> <li>- Adults previously monitored children's schooling activities</li> </ul> | <ul style="list-style-type: none"> <li>- Food received or bought is of nutritional quality</li> <li>- School curriculum is of quality and develops cognitive abilities of students</li> <li>- Children doing more HH chores affects negatively time schooling and not discretionary time</li> <li>- If children are not monitored, they will spend less time doing schooling activities (e.g. doing homework or studying)</li> </ul> |               |

Source: author's own elaboration drawing from multiple sources

The above table lays out the chain of events for the PSNP - context, inputs, outputs, outcomes, direct impact, impact on children – and the underlying assumptions incorporated in the model for each phase. In conceptualizing the PSNP’s impact on children, we can focus our analysis on the adults of the household, as children’s status is most likely to be a reflection of parental decisions (Woldehanna, 2009; Gahlaut, 2011). As such, we must note that the PW component of the PSNP affects adults through two distinct channels - income and time - which work in opposing directions.

#### 4.2.1. Explanation of the Income effect

Adults see an increase in their income through the program transfer, which automatically increases their purchasing power. This is what Woldehanna (2009) referred to as “Income effect”. In turn, this effect may impact children in three different ways:

##### (1) Increase in food intake → Improved child nutrition

For those household receiving food transfers, the link between this input and this output is more obvious. For those households receiving cash transfers, we must hypothesize that they will spend the money in buying food. In turn, if we hope to see improved child nutrition, that would mean that on the long term, we can expect the program to be able to build more resilience among children, to decrease malnutrition, to decrease their vulnerability and exposure to illnesses and to improve their cognitive and socio-emotional development during adulthood (Alderman, Hoddinott, & Kinsey, 2003; Paxson & Schady, 2007; Sanchez, 2013).

It seems important to consider some risks that might arise. For example, the former might sell the food received and in turn use it to buy other things (e.g. pay former debts, buy clothing...). Similarly, the latter might not buy food but invest in other assets or they might buy food which is less nutritious. According to economic thinking, humans maximize utility, and utility is a function of many things other than productivity (e.g. leisure or pleasure). Deaton and Subramanian (1996) demonstrate that higher purchasing power translates into increased food variety or better tasting products without necessarily increasing the amount of calories consumed to buying (e.g. buying less amount of rice –

which is cheaper – and buying instead some soda – which is more expensive). According to their study in India, households receiving an extra income of 10% will spend 7% on food, half of which will be spent on more calories and half of which will be in better tasting calories. This is, only 3.5% of the 10% increase in income will be invested in more nutritional food. If the size of the transfer is small, there is a risk that the nutritional impact is negligible. In Ethiopia, the 2008 Assessment Report (Devereux et al., 2008) shows that 73.7% of the food transfer beneficiaries were eating all the food, while the rest were either giving it away or selling it; and that cash transfers were mainly being spent on buying staple food and paying for education costs. However, Berhane et al. (2014) find no impact in the amount of food consumed by the Households and evidence on children's nutritional outcomes is mixed (Berhane et al. 2017; Porter & Goyal, 2015)

(2) Increase in school enrolment/attendance → Improved child cognitive abilities

Income constraint has been cited to be an important stopper for households sending their children to school (Fernald et al., 2008). Either because they need children to generate more income for the family or because sending them to school is just too expensive (fee payments, notebooks, books and uniforms...). Therefore, the PSNP may relieve families from this constraint, hence increasing children's schooling. In Ethiopia, Favara et al. (2017) find an improvement in math scores, but hypothesize that the pathway through which this improvement is operating is not schooling but improved nutrition

(3) Improved house environment → Improved child psychological well-being

Income constraint not only translates into physical deficits (e.g. mal nutrition and poor cognitive abilities) but also into psychological deficits. The assumption in this case is that relieving families from the income constraint will lead to a reduction in the amount of stress within the household, which will in turn, positively affect children's well-being, care, support and nurturance (Fernald et al., 2008). Given the difficulty in measuring psychological well-being, to my knowledge, no author evaluating the PSNP has yet tried to determine its impact on this matter.

#### 4.2.2. Explanation of the Time effect

As adults have to spend time working for the PWs, they see a reduction in their overall time availability. In turn, this decrease in adults' time availability may affect children through two different pathways:

(1) Increase in time spent in unpaid labor → decrease in time spent on schooling matters

As PWs demand adults' time, there may be tasks at the household that remain undone (e.g. cooking, cleaning, taking care of younger siblings, taking care of the cattle...). This might mean that children have increase their time spent at home. Children's total available time (T) must be divided between schooling activities (S), recreational activities (R) and paid or unpaid labor (L) (Gahlaut, 2011).

$$T = S + R + L$$

If L increases, it might do so at the expense of S and not necessarily of R, hence hurting children's educational outcomes. Similarly, L could increase not because children are forced to undertake household chores, but because children are participating in Public Works. Indeed, Woldehanna (2009) finds that the PSNP increased the amount of time children spent doing paid and unpaid labor. He also includes in his paper extracts from interviews revealing that children were participating in public work of the PSNP, although this might have changed over time (his study dates back to 2009). He indicates that a supervisor in Leki confessed that "children aged 14 and above participate in public work by replacing parents who may go to other activities. We do not care whether parents send their children or whether they come themselves because what we need is the job done. Children work better than the adults because they have the capability". Berhane et al. (2017) also shed some light on this issue thanks to their qualitative field study. A female participant in the region of Tigray declared that "when parents join the program, although children's chores increase, it lets them go to school. Some children weren't going because they were poor". Another participant from the same region also stated that "as you are required to cover your parent's work, it affects the time you need for study. You may not even get time to study, but the good thing with the safety net is it at least provides you the means to attend school".

(2) Reduction in monitoring → decrease in schooling outcomes

As parents decrease their time spent at home, their ability to oversee their children's use of time is also reduced. Consequently, with less monitoring, children may spend less time studying or doing homework which would deteriorate their schooling outcomes. To the author's knowledge, no study on the PSNP has tried to determine how this underlying mechanism might affect children's educational activities.

Given that the income and the time effect work in opposing forces and that most of the evidence is mixed, more evidence on how the PSNP affects children will contribute to this body of knowledge and will benefit overall efforts to reduce the unintended consequences of PWPs on the poorest and most vulnerable part of society.

## 5 GOALS AND RESEARCH QUESTION

This thesis seeks to contribute to the existing literature on Public Works Programs by studying the impact that the PSNP has had on children. It is expected that the results here presented will contribute to the literature in three important ways:

- Sharing new evidence on how the PSNP impacts children, emphasizing the underlying mechanism through which impact operates and providing a deeper understanding of the intended and unintended consequences of the program.
- Sharing further evidence on how PWP's affect children, in a way that is useful for existing efforts to redesign these programs to be more child sensitive.
- Joining efforts with current trends in development economics that claim and promote the importance of carrying out impact evaluation of social programs.

As such, the research question that guides this paper is the following: What impact has the PSNP had, in the medium term, on children's nutrition, schooling and unpaid labour activities?

In order to answer this question, the following specific goals are pursued:

- Measuring the impact of the PSNP on children's nutritional outcomes, as measured by height-for-age z-scores (HAZ), which is an indicator of nutritional status.
- Measuring the impact of the PSNP on schooling outcomes, as measured by time spent doing school related activities.
- Measuring the impact of the PSNP on child unpaid labor, as measured by time spent doing household chores.



## 6 METHODOLOGY

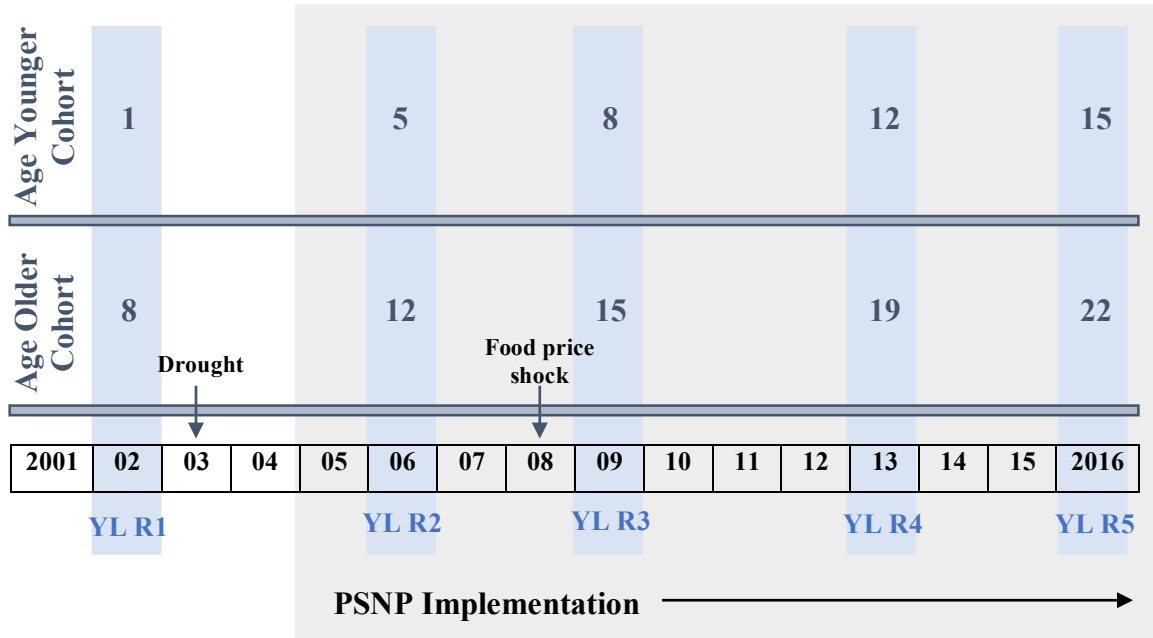
### 6.1. Data used and summary statistics

This paper uses the Young Lives Panel Data (Boyden, 2016) from the Young Lives study, an international initiative which raises awareness on childhood poverty. To that end, the study has been following 12,000 children in Ethiopia, India, Peru and Vietnam for the past 16 years. The data is publicly available under request and was obtained from the UK Data Service Database. Specifically, this thesis leverages on the data obtained from surveys carried out in Ethiopia in four different waves: 2002, 2006/7, 2009/10 and 2013/14 successively. Data for Round 5 (2017) is released in June 2018, before the completion of this thesis. Hence, I am not able to access the latest available data for my analysis. The surveys were administered in 20 different sentinel areas across five regions in Ethiopia (Amhara, Oromia, SNNP, Tigray and Addis Ababa), selected with a pro-poor focus. The study tracks the development of 3,000 children in two different cohorts, those born in 1994/95 (the older cohort) and those born in 2001/03 (the younger cohort), with a negligible attrition rate. Households interviewed were chosen randomly among those that had children born in those years (Young Lives, 2014). Given that program effects can differ depending on children's age, some studies have previously focus their efforts on only one of the two cohorts. Following that logic, I focus on only one of the cohorts depending on the outcome measured, as will be explained in section 7. The content of the surveys captures child, household and community characteristics. For example, data is available, among other indicators, on child age, sex, religion, health or nutrition; on household size, expenditure patterns and livestock ownership; and on geographical and environmental characteristics.

Although the Young Lives Panel Data was not collected with the specific purpose of evaluating the PSNP, its characteristics make it the most suitable dataset for the task. First, the PSNP operates conveniently in 14 of these 20 sentinel areas (Favara et al., 2017). Second, survey respondents were asked if they had participated in this program in the past 12 months, which allows us to identify PSNP household beneficiaries. Third, the first roll out of the PSNP in 2005 falls nicely in between the first two rounds of the YL panel data (see figure 3), circumstance on which I leverage to evaluate the impact of the program following a difference-in-difference strategy. Fourth, the surveys include a wide range of

indicators which allow me not only to measure different types of impact, but also to arrive to better estimates through the use of control variables.

Figure 3. Timeline of PSNP, Young Lives round surveys and child ages



Source: adapted from Favara et al. (2017)

In addition, in table 4, I provide some statistics on the different districts during the pre-intervention phase, this is, the 2002 round. The total number of observations during this round was of 2,999: 1,999 one-year-old children and 1,000 eight-year-old children. A total of 48% were male while 52% were female; and 65% lived in rural areas while 35% lived in urban sites. Given that the PSNP is only administered in rural areas, observations from urban citizens will be dropped for the analysis. Overall, a rapid glimpse into the statistics uncovers the precarious situation of the Ethiopian population: low wealth index (indicator that takes values from 0 to 1), health indicators and school enrolment. The percentage of PSNP participants is also included in the table, signalling high PSNP uptake within the sample (26% participated in the PSNP). In contrast, as expected, the percentage of beneficiaries of the DS component of the program is much smaller, standing at only 3.3%. Finally, see table A.2. in Appendix, for the descriptive statistics for Round 4.

Table 4. Pre-Intervention Descriptive Statistics

|   | Mean  | Std. Error | N     |
|---|-------|------------|-------|
| <b>SAMPLE CHARACTERISTICS</b>                 |       |            |       |
| % young cohort                                | 66.6% | 0.47       | 2,999 |
| % rural                                       | 65.0% | 0.48       | 2,999 |
| % male children                               | 48.0% | 0.50       | 2,999 |
| <b>HOUSEHOLD / INDIVIDUAL CHARACTERISTICS</b> |       |            |       |
| <b>Wealth Index</b>                           | 0.21  | 0.17       | 2,999 |
| First quintile                                | 0.09  | -          | 2,999 |
| Third quintile                                | 0.34  | -          | 2,999 |
| <b>Household size</b>                         | 5.96  | 2.18       | 2,999 |
| <b>HH Head's education (yrs)</b>              | 3.89  | 5.92       | 2,999 |
| <b>HAZ</b>                                    | -1.55 | 1.77       | 2,999 |
| <b>WAZ</b>                                    | -1.64 | 1.49       | 2,999 |
| <b>School enrolment</b>                       | 65.7% | 0.48       | 2,999 |
| <b>FOOD AID PROGRAMS</b>                      |       |            |       |
| <b>Participation in PSNP</b>                  | 26.0% | 0.38       | 2,999 |
| <b>Participation in DSP</b>                   | 3.3%  | 0.21       | 2,999 |

Note: Participation in PSNP and in DSP refers to participation in Round 3 or 4.

## 6.2. Empirical strategy

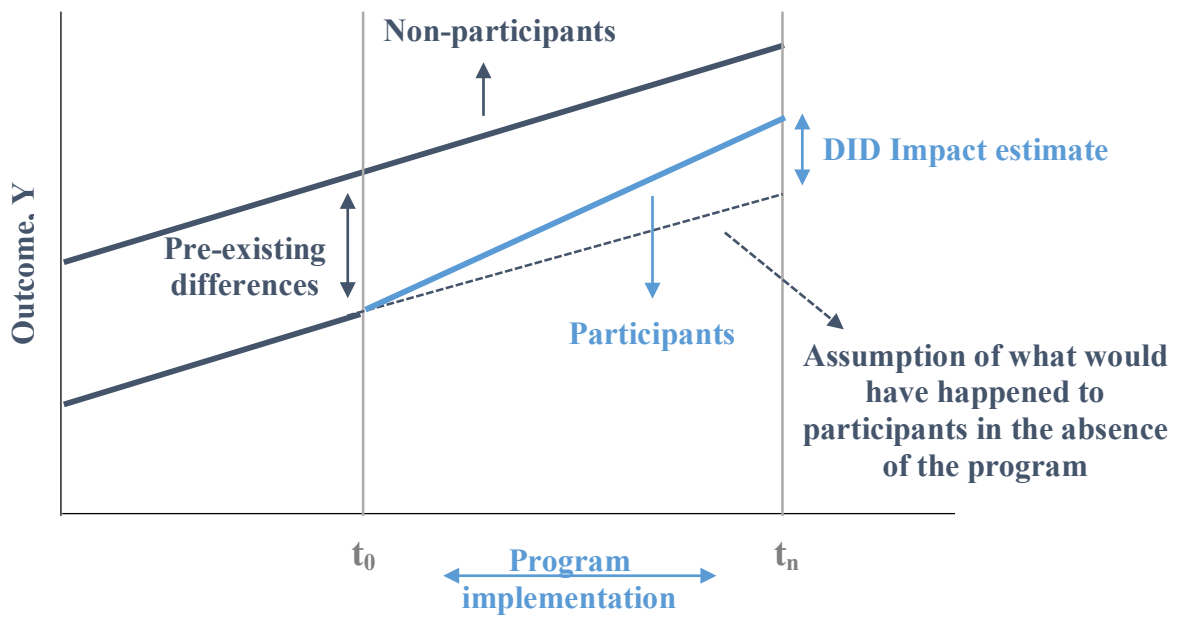
Before trying to estimate the impact of the PSNP, the econometric issues that arise from the fact that participation in the program was not randomly allocated must be properly addressed. Since we cannot observe what would have happened to program participants (treatment group) in the absence of the program, we encounter the problem of the counterfactual, crucial in any casual inference exercise. Furthermore, since PSNP beneficiaries systematically differ from non-beneficiaries (they are chosen with criteria of poverty and participation in previous food aid programs), we also face the problem of selection bias. This bias arises from the fact that it is highly probable that the same factors that explain why households are participating in the PSNP, also affect the outcome measured. To further illustrate these shortcomings, I next provide an example of the problems that arise when the two most straight-forward impact evaluation methods are applied; these are the before/after and the with/without methods.

On one hand, the before/after method would compare the mean in the outcome measured, say school attendance, in 2013 of children who were benefitting from the program at that time, to the mean in school attendance in 2002 of those same children. The problem with this method is obvious, children may be attending school more in 2013 than in 2002 for many reasons other than their participation in the PSNP. Put it simply, they might have been too young to even go to school in the first place in 2002. Thus, we would find a strong positive impact of the PSNP on school attendance, but the estimate would be clearly erroneous. These differences are unrelated to the program and are called time-varying factors. On the other hand, the with/without method would compare the means of school attendance in 2013 of children who were benefitting from the program at that time, to the mean in school attendance of children who were not benefitting from the program at that same time. In this case, the problem is that, unless participation in the program is randomly assigned, program beneficiaries tend to be systematically different to non-beneficiaries. This is, school attendance of beneficiaries is different to that of non-beneficiaries because the same household characteristics which were used to select beneficiaries (i.e. being poor) affect both participation in the program and our outcome indicator, in this case, school attendance. Hence, we would most likely find a negative impact (non-beneficiaries have higher attendance than beneficiaries because they had more financial resources in the first place), but our estimate would be biased. These differences are called time-invariant observed and unobserved characteristics and also include contextual differences like agro-climatic conditions or infrastructure development.

This paper uses a third evaluation method that arises from the combination of the with/without and before/after methods: the difference-in-differences (DID) estimation strategy. Shortly, a DID estimate measures the change over time in the chosen variable of program participants relative to the change in the same variable of non-participants. Figure 4 depicts graphically the functioning of this method. By subtracting the pre-existing differences in both groups to the existing differences in both groups in time  $n$  after the program, we obtain an estimate of the program impact. Empirically:

$$DID = E(Y_{i1} - Y_{i0} | T = 1) - E(Y_{i1} - Y_{i0} | T = 0)$$

Figure 4. Graphical explanation of a difference-in-differences strategy



Source: adapted from Gertler et al. (2011)

The main benefit of DID is that it controls for both time-varying and time-invariant factors, as well as for fixed group effects. Additionally, DID estimates lead to substantial reductions in selection bias in the estimated program impact (Angrist & Pischke, 2009). Nonetheless, the accuracy of the DID estimate is subject to one important assumption: that the evolution in the outcome for the beneficiaries would have been comparable to that of non-beneficiaries. This is what is known as the parallel trend assumption and it can be better understood by also looking at figure 4. The strategy also provides a biased estimate if there are other factors that affect the difference in trends between the two groups, between the baseline and the next survey. Section 7 details the robustness checks that this thesis includes in the analysis to account for these assumptions.

Given that the YLPD includes data for before and after the program, and for beneficiaries and non-beneficiaries, this strategy appears suitable for the purpose of this study. This strategy has been used similarly by Porter and Goyal (2015) and Tafere and Woldehanna (2012) in Ethiopia, by Escobal and Benites (2012) in Peru and by Hossain (2015) in India. Other estimation strategies like regression discontinuity design or instrumental variables were discarded due to the design of the program.

## 7 ANALYSIS AND DISCUSSION

### 7.1. Specification of empirical strategy

As has been explained, this thesis follows a difference-in-differences strategy to evaluate the impact of the PSNP on children's outcomes. This section presents the equations used to specify the empirical strategy for the outcomes of interest, spanning health, schooling and child labour indicators. Given that the PSNP is a rural program, the regression sample has been restricted to children living in rural areas (dropping 1,256 children) and to those for which data was collected across all four rounds (dropping 67 children), as was done similarly by Favara et al. (2017). After applying these restrictions, 56% of the 11,996 initial observations remain in the sub-sample. The three regressions used are the following:

$$HAZ_{it} = \beta_0 + \beta_1 Round4_t + \beta_2 PSNP_i + \beta_3 (Round4_t * PSNP_i) + e_{it} \quad (1)$$

In the above equation,  $HAZ_{it}$  refers to the outcome of interest, height-for-age z-scores, which is used as a proxy for nutritional status. Although measuring weight-for-age would have been more appropriate, given that this is a shorter-term measure of nutritional status, this measure is not available for Round 4 surveys. I use HAZ instead because it has also been widely used in the health literature.  $Round4_t$  takes on a 1 for the fourth round of observations and a 0 for the first round of observations. Although authors like Porter and Goyal (2015) use the 2006 round survey as a baseline, arguing that payments were delayed the first year of implementation of the PSNP and that previous studies had found no impact for Round 2, I use the 2002 round data as a baseline for my analysis instead. This is because expectations have elsewhere been reported to matter (Banerjee & Mullainathan, 2010; Gertler et al., 2011), meaning that even if households had not yet received any payments in 2006, their behaviour might have already been altered if the program had already been announced. This is particularly important for the issue at hand, given that households which knew that they had been granted participation in the program might have already changed their food consumption patterns by the time the second round of surveys was administered. The treatment variable,  $PSNP_i$ , is time-varying and binary. It takes value 1 (treatment group) if the household has reported participating in the PSNP in Round 4. My initial intention was to drop households which

only started to benefit from the program in 2012/13, which would have allowed us to measure the effects of the PSNP in the medium term (treatment group would have been benefiting from the program for at least 8 years). Nonetheless, I found that the sample group was greatly reduced after applying this restriction, which threatened the validity of the estimation. As a result, these households were finally included in the sample. I do drop those households which said “yes” to participating in the Direct Support Program, given that the analysis here laid out aims to focus on the impact of the PWs component of the program. Additionally, for this regression, the sample is also restricted to the younger cohort. According to the existing literature on nutritional status of children, the program might have a very different impact on children aged 11 and 4 respectively (when the program started to be implemented). The control group is thus comprised by those children in the younger cohort in households which have never participated in the PSNP. Finally,  $\beta_3$  is the coefficient of interest, the DID estimation, which captures the impact of the PSNP on the selected outcome on program beneficiaries. It multiplies the interaction term, which is to say a dummy variable that equals 1 for program participants after the implementation of the program.

$$Sch_{it} = \beta_0 + \beta_1 Round4_t + \beta_2 PSNP_i + \beta_3 (Round4_t * PSNP_i) + e_{it} \quad (2)$$

In equation (2),  $Sch_{it}$  refers to the outcome of interest, time spent doing school related activities, which is measured in hours (0-24) and is obtained by adding the time spent at school and the time spent studying outside of school<sup>12</sup>.  $Round4_t$  takes on a 1 for the fourth round of observations and a 0 for the second round of observations. I take 2006 as a baseline because the ages of the children in the sample requires the analysis to be performed that way: if I had studied the younger cohort, children would have been one-year-old in Round 1 (too young to go to school), but if I had studied the older cohort, children would have been 19-years-old in Round 4 (probably too old to go to school). This shortcoming is solved by using 2006 as a baseline instead of 2002 (indeed following Porter and Goyal (2015) this time) and studying the younger cohort (aged 5 in Round 2 and 12 in Round 4). The rest of the variables are akin to those in model (1).

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<sup>12</sup> Hschool and hstudy variables in the YL dataset

$$Hch_{it} = \beta_0 + \beta_1 Round4_t + \beta_2 PSNP_i + \beta_3 (Round4_t * PSNP_i) + e_{it} \quad (3)$$

The third equation shows the regression measuring the impact of the program in children's unpaid work activities. The dependent variable,  $Hch_{it}$  is obtained by adding the time spent by children running household chores and the time spent in domestic tasks<sup>13</sup>. For this analysis, I study the older cohort and use 2006 again as a baseline, because these variables are not available in the surveys of Round 1. The rest of the variables are akin to those in model (1).

Lastly, in all prior equations,  $e_{it}$  is the error term, which contains observable and unobservable characteristics which may affect child development in the areas here studied. This might be individual/household level, community level or child fixed characteristics. To account for this, I follow the strategy used in Favara et al. (2017), Porter and Goyal (2015) and Tafere and Woldehanna (2012) among others, and I control the above equations for wealth index, household composition and environment and social shocks (see table A.3. in Appendix for a description).

## 7.2. Results and discussion

In this section, I present the results obtained after running the difference-in-differences regressions on the three different outcomes analysed: height-for-age z-scores, time spent doing school related activities and time spent doing unpaid work. For all three models, I calculate three different regressions in which I subsequently add control variables and observe the variation in the coefficients obtained. This allows for the verification of the stability of the proposed models. For each one, I also compare my results with those of similar evaluations of the PSNP.

First, in table 5, the results of the impact of the program on height-for-age z-scores are presented. The round variable is only significant in regression (2), but it is worth noting that the coefficient for all regressions is negative. This might suggest that children's nutritional status worsens over time relative to non-participants. These results have been similarly found elsewhere, in studies about the widening gap in health over

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<sup>13</sup> Hchore and htask variables in the YL dataset



time between wealthy and poor people in developing countries (Hossain, 2015; Liu, Fang, & Zhao, 2013). We also observe that the coefficient of the variable wealth index is positive and significant at 1% level. This was a predictable outcome as wealth has a large impact on one's ability to be sufficiently fed and to grow healthily. Finally, the coefficient of the interaction variable captures the impact of the program. It is negative, but statistically insignificant in all the calculated regressions, which is surprising given that we would have expected this coefficient to be, if not statistically significant, at least positive. On the contrary, a negative coefficient could be explained if children's food consumption had worsened as the household increased its purchasing power for example by consuming better tasting and more expensive calories but less nutritious food (as hypothesized by Berhane et al. (2017)) or if parents participating in PWs' heavy tasks felt that they "deserved" to consume more calories in order to have more energy, at the expense of their children's food intake. Overall, the impact estimate is not significant, which means I cannot confirm these hypotheses but rather have to conclude that participation in the PSNP is not affecting young children's nutritional status.

Table 5. PSNP Impact on HAZ Z-Scores: Difference-in-differences

|                         | (1)             |               | (2)             |               | (3)             |               |
|-------------------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|
|                         | Coef.           | t             | Coef.           | t             | Coef.           | t             |
| <b>Round4</b>           | 0.11<br>(0.08)  | 1.331         | -0.19<br>(0.09) | -1.970<br>*   | -0.02<br>(0.11) | -0.191        |
| <b>PSNP</b>             | 0.1<br>(0.11)   | 0.861         | 0.07<br>(0.11)  | 0.645         | 0.06<br>(0.11)  | 0.521         |
| <b>Round4*<br/>PSNP</b> | -0.13<br>(0.16) | -0.831        | -0.08<br>(0.16) | -0.518        | -0.06<br>(0.16) | -0.373        |
| <b>Wealth index</b>     |                 |               | 1.68<br>(0.3)   | 5.620<br>***  | 1.58<br>(0.3)   | 5.245<br>***  |
| <b>Household size</b>   |                 |               | -0.01<br>(0.02) | -0.485        | -0.01<br>(0.02) | -0.461        |
| <b>Shocks</b>           |                 |               |                 |               | YES             |               |
| <b>Constant</b>         | -1.72<br>(0.05) | -32.06<br>*** | -1.85<br>(0.12) | -15.65<br>*** | -1.9<br>(0.12)  | -15.45<br>*** |
| <b>Observations</b>     |                 | 2,225         |                 | 2,209         |                 | 2,209         |
| <b>R-Squared</b>        |                 | 0.000         |                 | 0.013         |                 | 0.013         |

Note: \*p < 0.1; \*\*p < 0.05; \*\*\*p < 0.01

Standard deviations are presented in parenthesis

These findings contribute to the existing conflicting evidence on the effects of the PSNP on children's health. While Porter and Goyal (2016) found positive effects on HAZ z-scores after Round 3 YL surveys (2009); Berhane et al. (2017) used a different dataset and a different estimation strategy and show that the PSNP by 2014 had had no impact on this indicator. My results in this case match the latter. It is also worth highlighting that I used Round 1 (2002) as a baseline, as opposed to Round 2 (2006) which is used in Porter and Goyal (2016). The purpose of this change was to try to measure the effect of expectations on program participants: given that the program started to be implemented in 2005, and although payments were not received until 2006, PSNP beneficiaries might have changed their behaviour by the time the second round of surveys was administered. Finding a larger impact than Porter and Goyal (2016) did would have supported this hypothesis. However, given my results, I cannot make a valid conclusion on this matter.

Second, in table 6, the results of the impact of the program on time spent in school or doing school related activities are presented. The round variable is in this model positive and statistically significant. This means that a child from the younger cohort spent in 2013, 5.7 more hours on average in school or studying, than a child in 2006. This is not surprising given that in 2006, the younger cohort was only about 5-years-old, which means they might have been too young to go to school for long hours or to bring homework to do at home. Analogous to what happened in model 1, the wealth index coefficient is statistically significant and positive, signalling that children from wealthier households can dedicate more time to school. On the contrary, children from poorer backgrounds might be forced to invest their time doing either paid or unpaid work, or simply they might not be as aware of the value of education as wealthier children. Finally, the interaction variable is negative which suggests that the initial suspicion that participation in the PSNP might be hurting children's schooling might have been correct. However, the coefficient is not statistically significant, so I can't fully confirm my hypothesis with this model. These results support the findings in Tafere and Woldehanna (2012), where no impact of the PSNP on time spent in school is found. They measured the impact only 4 years after the program is implemented, and my results suggest that the program has no impact still 8 years after the implementation of the program.

Table 6. PSNP Impact on Schooling: Difference-in-differences

|                       | (1)             |               | (2)             |              | (3)             |              |
|-----------------------|-----------------|---------------|-----------------|--------------|-----------------|--------------|
|                       | Coef.           | t             | Coef.           | t            | Coef.           | t            |
| <b>Round4</b>         | 5.95<br>(0.1)   | 57.16<br>***  | 5.75<br>(0.11)  | 52.17<br>*** | 5.69<br>(0.12)  | 47.05<br>*** |
| <b>PSNP</b>           | -0.26<br>(0.16) | -1.593        | -0.29<br>(0.16) | -1.811       | -0.31<br>(0.16) | -1.917       |
| <b>Round4*</b>        | -0.14<br>(0.21) | -0.653        | -0.08<br>(0.21) | -0.387       | -0.06<br>(0.21) | -0.305       |
| <b>Wealth index</b>   |                 |               | 1.83<br>(0.36)  | 5.013<br>*** | 1.83<br>(0.37)  | 4.873<br>*** |
| <b>Household size</b> |                 |               | -0.04<br>(0.02) | -1.747       | -0.04<br>(0.02) | -1.587       |
| <b>Shocks</b>         |                 |               |                 |              | YES             |              |
| <b>Constant</b>       | 0.51<br>(0.08)  | -6.540<br>*** | 0.44<br>(0.18)  | 2.478*       | 0.55<br>(0.18)  | 3.069<br>*** |
| <b>Observations</b>   | 1,880           |               | 1,877           |              | 1,877           |              |
| <b>R-Squared</b>      | 0.697           |               | 0.700           |              | 0,702           |              |

Note: \*p < 0.1; \*\*p < 0.05; \*\*\*p < 0.01

Standard deviations are presented in parenthesis

Third, table 7 presents the results of the impact of the PSNP on time spent doing unpaid work (household or domestic chores). The round variable is again in this model positive and statistically significant, suggesting that 19-year-old children spend more time doing tasks at home than 12-year-old children. This effect might be driven by the females in the sample, given that at the age of 19 they can be already considered adults with family responsibilities. The coefficient of the wealth index is negative and statistically significant at 5% level, suggesting as the literature has shown, that wealthier children are less required to take responsibility for household chores. Finally, the interaction variable is negative but not statistically significant. Conceptually, the direction of the coefficient suggests that children who benefit from the PSNP spend 0,06 hours less doing unpaid work than if they had not benefitted from the program. This would have been a positive finding if we could confirm that these hours are being substituted by time spent in school-related activities. Once again, since the impact estimates are insignificant, I can't confirm these hypotheses. The results here presented contradict those found by Tafere and Woldehanna (2012) after YL Round 3 (they found an increase of 0.13 hours spent in unpaid labour) but support those found by Woldehanna (2009) after YL Round 2. Overall, it seems that the impact of the PSNP on children's time distribution is insignificant and

thus results are unclear, as Berhane et al. (2017) had found after measuring impact in 2014.

Table 7. PSNP Impact on time spent in unpaid work: Difference-in-differences

|                         | (1)             |              | (2)             |               | (3)             |               |
|-------------------------|-----------------|--------------|-----------------|---------------|-----------------|---------------|
|                         | Coef.           | t            | Coef.           | t             | Coef.           | t             |
| <b>Round4</b>           | 0.69<br>(0.19)  | 3.701<br>*** | -0.90<br>(0.20) | 4.525<br>***  | 1.03<br>(0.23)  | 13.543<br>*** |
| <b>PSNP</b>             | 0.04<br>(0.28)  | 0.148        | 0.02<br>(0.28)  | 0.061         | 0.11<br>(0.28)  | 0.406         |
| <b>Round4*<br/>PSNP</b> | -0.70<br>(0.39) | -1.790       | -0.72<br>(0.39) | -1.838        | -0.76<br>(0.39) | -1.940        |
| <b>Wealth index</b>     |                 |              | -2.37<br>(0.73) | -3.234<br>**  | -2.33<br>(0.75) | -3.131<br>**  |
| <b>Household size</b>   |                 |              | -0.02<br>(0.04) | 0.384         | 0.01<br>(0.04)  | 0.310         |
| <b>Shocks</b>           |                 |              |                 |               | YES             |               |
| <b>Constant</b>         | 4.38<br>(0.12)  | 34.25<br>*** | 4.77<br>(0.34)  | 14.069<br>*** | 4.70<br>(0.35)  | 13.435<br>*** |
| <b>Observations</b>     | 1,009           |              | 1,008           |               | 1,108           |               |
| <b>R-Squared</b>        | 0.012           |              | 0.022           |               | 0.024           |               |

Note: \*p < 0.1; \*\*p < 0.05; \*\*\*p < 0.01

Standard deviations are presented in parenthesis

In all of the previous models, the difference-in-differences estimator (the coefficient for the interaction variable “Round4\*PSNP”), which captures the impact of the program, is statistically insignificant. This can be interpreted in two different ways: either the mean change in outcomes from before and after the implementation of the PSNP was not different in the treatment and control groups or the models proposed were not robust enough. I begin by exploring the first interpretation: that the PSNP is indeed not affecting children on the studied outcomes. Contrary to what critics claimed, PWPs are not designed to impact children directly and its impact on adults does not seem to necessarily affect children. This would mean both that the Income effect is not large enough as to allow children to reap off the benefits of household participation in the program, hence it does not translate into increased food intake, increased school attendance/enrolment or improved house environment; and that the Time effect is also not large enough, which is a negative finding in that the PSNP is not allowing children from program beneficiaries to dedicate more time to school, but a positive one in that it is also not forcing them to

spend more time doing household chores. This first interpretation could also be explained if program design and assumptions were imperfect. For example, if payments were not made at the established amounts and timings, their lack of predictability would prevent households from changing their spending patterns and in turn, I would find no impact. Furthermore, if the key assumptions (e.g. that lack of sufficient income is the main barrier stopping children from going to school) are incorrect, this would also explain why I find no impact in my estimates. Lastly, I must also consider that the chosen indicators might not be optimal. For instance, children might be better fed under the PSNP but not enough or for enough time as to see effects in HAZ z-scores; in which case other indicators like weight-for-age z-scores would have been more appropriate.

I now turn to the examination of the second interpretation of the results: that the impact estimates presented are not reliable given the PSNP's non-random placement and the proposed models. I have acknowledged this difficulty and have used the impact estimation strategy which better suited the analysis and the data at hand. In addition, I have restricted the sample to create a broad comparable control group. Other studies (Favara et al., 2017; Porter & Goyal, 2015) use as a control group those households which were shortlisted for the PSNP but ended up not participating in the program. Although this would have been a more appropriate control group (given that these household would be very similar in observable and unobservable characteristics to the treatment group), I do not have access to shortlisting information. Moreover, I add controls to the models which can affect the trend in the outcome measured differently in the treatment and control groups. Although I tried adding other control variables like gender, food consumption or head of household's education, I encountered problems either because of missing data or because of multicollinearity. I also acknowledge that households which only started to benefit from the program from 2009 to 2012/3 are included in the sample. This means that even if I hoped to measure outcomes in the medium term, this sub-sample, which has been benefiting from the program less and for which impact might have been negligible compared to the rest, might be distorting the findings here presented. Finally, the parallel trend assumption is also a strong limitation of this type of econometric analysis.

## 8 CONCLUSIONS

The Productive Safety Net Programme in Ethiopia is the second largest social protection program implemented in Sub-Saharan Africa. It was first implemented back in 2005 to address Ethiopia's food insecurity problem, with the main goal of building resilience and preventing asset depletion among the poor through a boost in household income. The PSNP is configured as a Public Works Program, under which participants are employed in public projects in their community in exchange of food or cash transfers. PWPs are a type of social safety net program commonly used in contexts where famines or food crisis are recurrent (Sen, 1999, p. 40). As a consequence, they are widespread in the developing world and mostly in the African continent (World Bank, 2015). Despite the vast amount of resources invested in these social schemes, rigorous evidence on their impact is still limited. This paper has stressed the importance of carrying out impact evaluations in ensuring that development goals are met and that the poor's welfare is improved. Particularly, the focus of this paper has been to examine, through the study of the PSNP, how PWPs affect children and to disentangle the pathways through which impact operates. My analysis responds to recent criticism targeted at PWPs, claiming that since these programs aim to improve outcomes at the household level, their effects on intra-household dynamics are being left unexplored, even if the most vulnerable family members might be negatively impacted by the program.

Briefly, this study has reviewed the existing evidence on the impact on children outcomes of CCTs (because they are akin to PWPs in many ways and they have been much more analyzed) and of PWPs. The former have been found to have mostly a positive impact across the studied children outcomes. However, CCTs' main goal is in most cases to break intergenerational poverty, which explains why these safety nets ensure that they are positively affecting children. On the contrary, for PWPs, children's well-being is only a secondary goal. This might explain why evidence on PWPs impact on children outcomes is mostly mixed. To enlighten this situation, I have laid out a Theory of Change for the PSNP, in which two impact mechanisms are highlighted: the Income effect and the Time effect. The Income effect translates into an increase in household purchasing power, which can affect children in three ways: an increase in food intake which may improve their nutrition; an increase in school attendance/enrolment which may improve their cognitive abilities; and an improved house environment which may improve their

psychological well-being. The time effect translates into a decrease in adults' time availability which can affect children in two ways: an increase in time spent doing household chores, which may require them to allocate less time to school matters; and a reduction in their monitoring, which may lead to a worsening in their schooling outcomes. Section 4 also highlights the main risks and the key assumptions of this TOC.

Following this framework, I have thereafter analyzed the impact of the PSNP on children's nutrition (as measured by HAZ z-scores), schooling (as measured by time spent in school related activities) and unpaid labor activities (as measured by time spent in unpaid labour). I have used a difference-in-differences estimation strategy, which allows me to establish a causal nexus between participation in the program and the results obtained. Additionally, this method controls for time-varying and time-invariant characteristics and substantially reduces selection bias (Angrist & Pischke, 2009). The availability of Young Lives Panel Data for years 2002, 2006, 2009 and 2013 makes this strategy possible. I do not find any statistically significant impact of the program on the analyzed indicators. Thus, my results build on previous evidence of the PSNP which suggests that the effects of the program on children are unclear and simply that household gains may not trickle down to children. It is worth noting in this respect that no impact was found, thus the PSNP does not seem to improve children's nutrition nor alter children's time distribution. However, it also means that participation in the program does not seem to hurt children's outcomes either, which was one of the major worries of the previously mentioned critics. Lastly, my findings are contingent upon the robustness of the proposed empirical model, which has limitations like the parallel trend assumption or the assumed adequacy of the broad control group. I control the models for several control variables and limit the sample to rural households, but recognize that the comparability of the constructed control group may still be insufficient.

I encourage future work to improve the estimation strategy through matching methods (e.g. propensity score matching) in order to provide more robust results. In addition, it would also be interesting to see, once the results of YL Round 5 are released, if these outcomes are still unaffected 12 years after the PSNP was first rolled out. Finally, as other studies have reported for similar programs, the effects of the program can be different for different sub-groups. Thus, it would also be interesting to disaggregate the impact of the program according for example to gender, to region or to graduation status.

To conclude, for Ethiopia's food policy to be truly embedded in its long-term development strategy, the country must embrace a more holistic approach to poverty reduction. As children's outcomes are incorporated to the main goals of its food policy agenda and as broader effects are tracked, monitored and analyzed, the intricacy of the poverty problem will be recognized and the effectiveness of its development policies will surely be improved.



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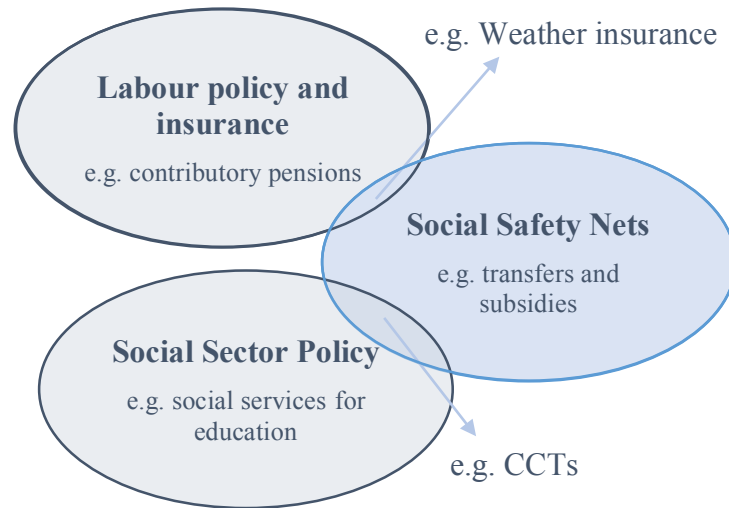
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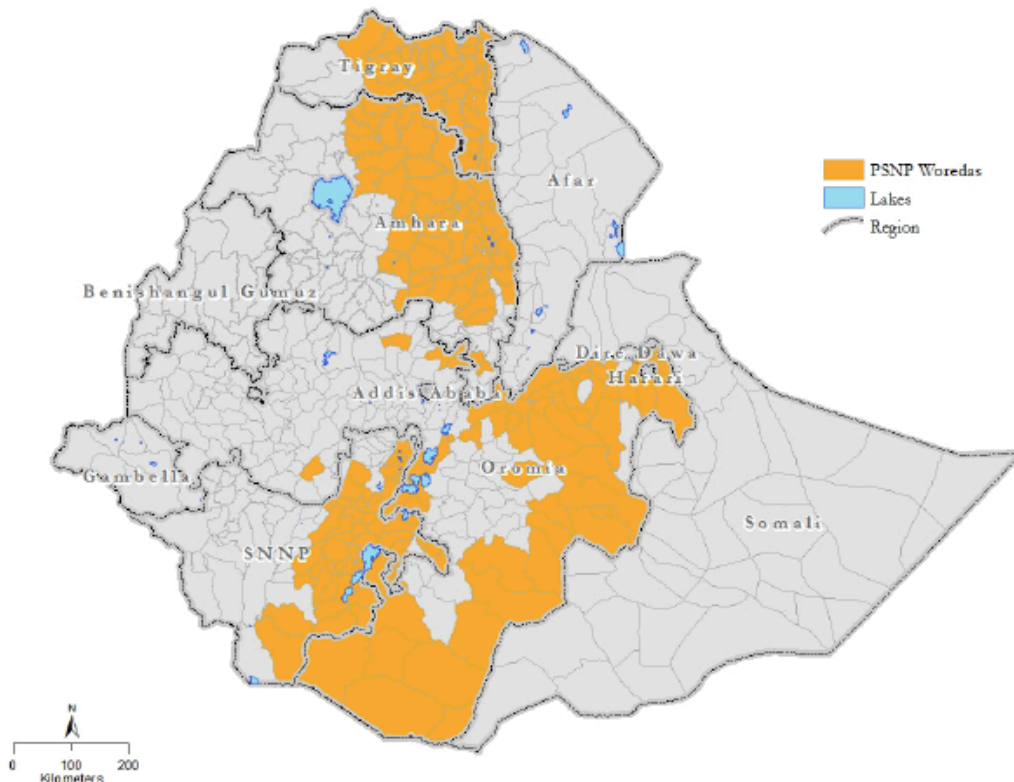
## 10 APPENDIX

Figure A.1. Components of social protection



Source: Gentilini and Omamo, 2011

Figure A.2. Map of PSNP woredas



Source: Filipski et al. (2017)

Table A.1. Summary of PSNP Impact Evaluations (non-exhaustive)

| <b>Impact level</b>     | <b>Area of Impact Assessed</b> | <b>Paper</b>  | <b>Indicator used</b>   | <b>Source of data</b> |
|-------------------------|--------------------------------|---|---|-----------------------|
| <b>System level</b>     | Climate change                 | MoARD (2015)  | CO <sub>2</sub> emissions   | MoARD                 |
|                         | Economic stimulation           | Filipski et al. (2017)  | Grain and vegetable yields and nation-wide economic growth  | Own surveys           |
| <b>Household level</b>  | Food Security                  | Gilligan et al. (2008)  | Shortfall in caloric availability, daily per capita caloric acquisition, change in months of food security and n° of children's meals per day | Own surveys           |
|                         |                                | Berhane et al. (2014)   | N° of self-reported food secured months, livestock accumulation and food consumption  | CSA                   |
| <b>Individual level</b> | Child health                   | Porter and Goyal (2016)   | HAZ and WAZ z-scores  | YLPD                  |
|                         |                                | Berhane et al. (2017)   | HAZ and WAZ z-scores, stunting and wasting  | CSA                   |
|                         | Schooling                      | Berhane et al. (2017)   | Grade attainment, school enrolment, drop-out rate, completion of at least one year of schooling   | CSA                   |
|                         |                                | Tafere and Woldehanna (2012)  | Time spent at school and studying, grade-for age and highest grade completed  | YLPD                  |
|                         |                                | Favara et al. (2017)  | Math and literacy skills (PPVT)   | YLPD                  |
|                         | Child labour                   | Berhane et al. (2017)   | Time spent on domestic tasks  | CSA                   |
|                         |                                | Camfield (2014)   | Time spent on household chores (females only)   | YLPD                  |
|                         |                                | Woldehanna (2009)   | Time spent in paid and unpaid work and time spent in childcare and household chores   | YLPD                  |
|                         | Tafere and Woldehanna (2012)   | Time spent in paid and unpaid work and time spent in childcare and household chores | YLPD  |                       |

*Table A.2. Descriptive Statistics for Round 4 YL survey*

|   | <b>Mean</b> | <b>Std. Error</b> | <b>N</b> |
|---|-------------|-------------------|----------|
| <b>SAMPLE CHARACTERISTICS</b>                 |             |                   |          |
| <b>% young cohort</b>                         | 66.6%       | 0.47              | 2,999    |
| <b>% rural</b>                                | 56.8%       | 0.50              | 2,999    |
| <b>% male children</b>                        | 47.0%       | 0.50              | 2,999    |
| <b>HOUSEHOLD / INDIVIDUAL CHARACTERISTICS</b> |             |                   |          |
| <b>Wealth Index</b>                           | 0.37        | 0.17              | 2,999    |
| First quintile                                | 0.24        | -                 | 2,999    |
| Third quintile                                | 0.37        | -                 | 2,999    |
| <b>Household size</b>                         | 5.72        | 2.07              | 2,999    |
| <b>HH Head's education</b>                    | 10.08       | 10.5              | 2,999    |
| <b>HAZ</b>                                    | -1.34       | 1.04              | 2,999    |
| <b>WAZ</b>                                    | NA          | -                 | 2,999    |
| <b>School enrolment</b>                       | 83.0%       | 0.38              | 2,999    |
| <b>FOOD AID PROGRAMS</b>                      |             |                   |          |
| <b>Participation in PSNP</b>                  | 26.0%       | 0.38              | 2,999    |
| <b>Participation in DSP</b>                   | 3.3%        | 0.21              | 2,999    |



Table A.3. Description of control variables used in estimation regressions

| <b>Control variable</b>      | <b>Variable name in YLPD</b> | <b>Description</b>  |
|------------------------------|------------------------------|---|
| <b>Wealth Index</b>          | Wi                           | Numeric variable (0-1) that   |
| <b>Household Composition</b> | Hhsize                       | Numeric variable that indicated the number of members composing the household.  |
| <b>Shock drought</b>         | Shenv1                       | Dummy variable. Takes on a 1 if the household has experience a drought since the last round of surveys and a 0 otherwise            |
| <b>Shock flooding</b>        | Shenv2                       | Dummy variable. Takes on a 1 if the household has experienced a flooding since the last round of surveys and a 0 otherwise          |
| <b>Shock erosion</b>         | Shenv3                       | Dummy variable. Takes on a 1 if the household has experienced a erosion since the last round of surveys and a 0 otherwise           |
| <b>Shock frost</b>           | Shenv4                       | Dummy variable. Takes on a 1 if the household has experienced a frost since the last round of surveys and a 0 otherwise             |
| <b>Shock pests on crops</b>  | Shenv5                       | Dummy variable. Takes on a 1 if the household has experienced a pest on its crops since the last round of surveys and a 0 otherwise |
| <b>Shock crop failure</b>    | Shenv6                       | Dummy variable. Takes on a 1 if the household has experienced a crop failure since the last round of surveys and a 0 otherwise      |
| <b>Shock death of father</b> | Shfam1                       | Dummy variable. Takes on a 1 if the father of the household has died since the last round of surveys and a 0 otherwise              |
| <b>Shock death of mother</b> | Shfam2                       | Dummy variable. Takes on a 1 if the mother of the household has died since the last round of surveys and a 0 otherwise              |

*Table A.4. PSNP Impact mechanisms: program beneficiaries' evolution*

|                                   | <b>Round 1</b>     | <b>Round 4</b>       | <b>Change</b> |
|-----------------------------------|--------------------|----------------------|---------------|
| <b>Wealth Index</b>               | 0.12<br>(0.08)     | 0.27<br>(0.11)       | + 0.15        |
| <b>Food Expenditure*</b>          | 361.26<br>(242.33) | 1,220.63<br>(627.82) | + 859.37      |
| <b>Total Expenditure*</b>         | 499.29<br>(288.26) | 1,746.76<br>(915.52) | + 1,247.47    |
| <b>HH who own livestock (%)</b>   | 71.36%<br>(0.45)   | 91.71%<br>(0.28)     | + 20.35 pp    |
| <b>HH head's education (yrs.)</b> | 1.91<br>(5.08)     | 9.65<br>(11.8)       | + 7.34        |
| <b>Household size</b>             | 5.67<br>(2.05)     | 5.76<br>(1.89)       | + 0.09        |
| <b>HAZ</b>                        | -1.68<br>(1.87)    | -1.54<br>(0.99)      | + 0.14        |
| <b>Stunting (%)</b>               | 49.61%<br>(0.50)   | 32.35%<br>(0.47)     | - 17.26 pp    |
| <b>School enrolment (%)</b>       | 48.28%<br>(0.50)   | 80.35%<br>(0.40)     | + 32.07 pp    |
| <b>Time paid work*</b>            | 0.09<br>(0.56)     | 0.55<br>(2.03)       | + 0.46        |
| <b>Time leisure*</b>              | 6.86<br>(4.16)     | 3.64<br>(2.12)       | - 3.22        |

Note: n = 398.

Standard deviations are presented in parenthesis. \*Data for Round 1 is not available so I indicate means for Round 2 instead