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Three essays on
the impact of cash transfers
on food security and labor supply:
the case of South Africa

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Introductory section

During the last decades, social protection expanded relevantly, particularly in emerging economies such as those of South Africa, Brazil, China, Mexico. Cash transfers are an important and growing part of social protection initiatives “*that provide income or consumption transfers to the poor, protect the vulnerable against livelihood risks, and enhance the social status and rights of the marginalized; with the overall objective of reducing the economic and social vulnerability of poor, vulnerable and marginalized groups*” (Devereux and Sabates-Wheeler 2004, p.9).

Since the ‘90s, the scientific community has become increasingly interested in social protection systems and, in particular, in cash transfer programmes as instruments to reduce poverty; since the 2000s, these programmes have been evaluated under a holistic approach to development and from a forward-looking perspective. Indeed, social protection systems, including large cash transfer programmes, were progressively implemented with a side commitment to systematize monitoring procedures and evaluations studies. The main purpose was to gain evidence on their effectiveness in achieving the intended results and make use of any lessons learned to inform the development agenda. Thanks to randomized control trials and quasi-experimental methods, the provided evidence is reliable and robust (Grosh 2008; Gentilini and Omamo 2011).

In this framework, this study aims to provide new evidence - through a quasi-experimental method - on the effectiveness of cash transfers, in particular in addressing basic consumption needs of the beneficiaries households and in influencing households’ labor market behavior. To this purpose, this thesis looks at the case of South African cash transfers - or social grants - that provide economic support to the poorest and most vulnerable households.

It is worth noting that the first significant experiences of cash transfer programmes were launched in Latin America and, later on, in Asia, and that the strongest available evidence on cash transfers came from middle income countries in Latin America (e.g. the *Progres/Oportunidades* in Mexico and the *Bolsa Escola/Família* in Brasil), revealing that these programmes were successful in reducing poverty and vulnerability among the beneficiaries and in improving their educational levels and health status.

Following these successful experiences, since the 2000s, cash transfers were progressively implemented also in sub-Saharan African countries. Some questions were raised about the effectiveness of cash transfers in lower income countries with higher incidence of poverty, lower administrative capacities and less developed financial systems. As a consequence, a forward-looking perspective became of primary importance also for the sub-Saharan African cases (Davis *et al.* 2012). Among the countries in this area, we believe that the case of South Africa is particularly interesting for a number of reasons.

First, South African social grants represent one of the main components of the social protection framework aiming at alleviating and reducing poverty, vulnerability, inequalities and social exclusion inherited from the apartheid.

Second, South Africa, by reaching more than a quarter of its population through social grants, implements the largest cash transfers system in Africa and one of the largest among the developing countries.

Third, the South African cash transfers programmes are among the oldest in the continent and, to date, there is a growing body of evidence on their impacts on a number of beneficiaries' dimensions of well being.

Recognizing that poverty is endemic and enduring for many people, also because of a lack of employment opportunities in the country, South African social grants typically sustain households characterized by few income earners and many dependants over a long period of time (Aliber 2001). Benefits for groups vulnerable to poverty and in need of state support can in fact start from childhood, with a child support grant that covers until the 18th birthday, then provide a pension for poor people in old age and may include a disability grant.

The role of cash transfers is thus to provide financial or productive resources to satisfy beneficiaries' basic needs, such as food, and - in a longer period - to contribute to the improvement of their well being, from the reduction of chronic food insecurity to the formation of human capital. But some concerns have arisen over the possibility that, trapped into poverty and unemployment, many beneficiaries become dependent from the aid.

As a contribution to the ongoing debate, this study analyzes the role played by cash transfer programmes in South Africa from different perspectives.

At first, we provide a literature review on different cash transfer programmes and from a theoretical point of view.

Then, we proceed with two empirical studies focused on the South African Child Support Grant (CSG), the largest unconditional cash transfer in the country in terms of number of reached beneficiaries, targeted to the poorest and most vulnerable children and their families. We assess its impact on food expenditure and dietary diversity and on gender inequality in the labor market.

To estimate the programme impacts, we apply a regression discontinuity design, which is a quasi-experimental method firstly introduced by Thistlethwaite and Campbell (1960) and then applied in a number of empirical research, also in economics (Lee and Lemieux 2010). This methodology exploits arbitrary changes introduced in the rules determining treatment and allows to identify the causal effect of a programme by comparing people affected by the rule with people who are not. In the case of CSG, we can exploit registered changes in the age eligibility rules.

The thesis is therefore composed of three essays.

The first one (*The Impact of Cash Transfers in South Africa: a Literature Review*) is an overview on the effectiveness of unconditional cash transfers implemented in sub-Saharan African countries on food security and labor supply. It examines the theoretical pathways that link cash transfers programmes to these two development outcomes and the assumptions that underlie their efficacy. It

also reviews the available evidence about the impact of cash transfers on the above mentioned two dimensions of development, with a focus on the case of South Africa. The main aim of this review is to gain, from the case of South Africa, some insights to evaluate the effectiveness of unconditional cash transfers implemented in sub-Saharan African countries.

The second essay (*Evaluating the Impact of the South African Child Support Grant on Food Expenditure and Dietary Diversity*) evaluates the impact of the Child Support Grant on the food expenditure as a proxy of the food access and on the dietary diversity of the beneficiary households. While the version presented in this thesis is the result of a more personal study, an advanced version of this study was co-authored by professor Scarlato and dr. d'Agostino (tutor and co-tutor of this PhD thesis) as a working paper titled “*Do Cash Transfers Promote Food Security? The Case of the South African Child Support Grant*” (d'Agostino, Scarlato and Napolitano 2016).

The third essay of this thesis (*The Impact of the Child Support Grant on Gender Inequality in the South African Labor Market*) focuses on the impact evaluation of the Child Support Grant on the employment opportunities and employment type of working age women and men in beneficiaries' households. The study assesses, under a gender lens, whether the grant reduces inequalities in the labor market.

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The Impact of Cash Transfers on Food Security and Labor Supply in South Africa: a Literature Review

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Abstract

Since the 2000's, cash transfers have been welcomed as an effective instrument to address development objectives. This study will focus particularly on the development outcomes concerning households' food security and labor supply. The literature about cash transfers effectiveness is wide, especially if referred to the conditional cash transfers implemented in Latin America. But evidence about unconditional cash transfers in sub-Saharan Africa is still building and still few studies clarify what are the mechanisms by which cash transfers reach development objectives. To this purpose, this paper considers the theoretical pathways that link cash transfer programmes to food security and labor supply and the assumptions that underlie their effectiveness. The analysis of the case of South Africa, which implements exceptionally widespread unconditional cash transfer programmes, and the related review of the evidence provide a number of insights to evaluate the effectiveness of unconditional cash transfers, in particular for sub-Saharan African countries.

Keywords: cash transfers, sub-Saharan Africa, food security, labor supply.

JEL code: I38, I32, O55, J22.

1. Introduction

Cash transfers are a form of social protection that target poor people with the aim to sustain households' basic needs in the short run, reduce vulnerability to external shocks and interrupt the intergenerational transmission of poverty in the long run.

This study will analyze the theoretical pathways for cash transfer programmes' impact on food security and labor supply, together with the assumptions that underlie their effectiveness.

The study will particularly focus on the case of South Africa, which implements cash transfer programmes that are exceptionally widespread. The available evidence will be reviewed and points of strength and weaknesses in cash transfer programmes implementation will be highlighted.

The paper is organized as follows: *Section 2* defines the boundaries of our study, explaining why our interest is focused on sub-Saharan African countries and in food security and labor supply; *Section 3* justifies the focus on the case of South Africa and provides an overview of its social protection system; *Section 4* focuses on the theoretical pathways that associate cash transfers and food security and reviews the evidence of the impact of South African cash transfers on food security outcomes; *Section 5* focuses on the theoretical pathways that associate cash transfers and labor supply and reviews the evidence of the impact of South African cash transfers on labor supply; *Section 6* concludes.

2. Boundaries for a literature review

Cash transfers represent a form of social protection and, more specifically, of social assistance.

States, other public entities or non-governmental organizations, provide noncontributory payments of money to poor or vulnerable beneficiaries - individuals or households - to provide relief from poverty and deprivation and to reduce social risks and economic vulnerability (Devereux and Sabates-Wheeler 2008; Samson 2009).

Since the 1990's, cash transfers have been implemented in Latin America, Asia and sub-Saharan Africa with various scopes and designs: some cash transfer programmes are provided for emergency responses, others for long-term development purposes; some are conditioned to specific beneficiaries behaviors (as school enrollment and attendance, health check-ups or children's immunization), others are unconditional (without requirements attached); some are universal, others are targeted to specific social groups considered particularly vulnerable (children, old persons, disables...).

This paper focuses on those cash transfers - in particular the unconditional ones - that, being stable and predictable over a long period of time, aim at reaching development objectives in the long run.

The ways cash transfers contribute to development are threefold. First, in the short term, they support household's minimum levels of consumption and protect their living standards. Providing a relief from poverty and deprivation, cash transfers also enable households to better cope with shocks

(Künnenmann and Leonhard 2008). Second, in the medium term, cash transfers - by enhancing households' real income, capabilities and opportunities of investment - impact their productive livelihood strategies, promote more productive activities and contribute to improve beneficiaries education and health outcomes (Devereux and Sabates-Wheeler 2008). Third, in the long term, cash transfers may reduce households' vulnerability and break the intergenerational transmission of poverty (Samson 2009).

Since the 2000s, the role of social protection and cash transfers has been appreciated under a holistic approach to development (Gentilini and Omamo 2011). The outcomes that could be considered are thus numerous and of various types. Among these, the outcomes concerning households' food security and labor supply are particularly relevant for the sub-Saharan African countries.

Indeed, since the Universal Declaration of Human Rights in 1948, the right to adequate food and social protection for vulnerable people has been recognized by the global development agenda. The Millennium Development Goals endorsed to cut in half the proportion of people living with hunger and poverty by 2015. The developing regions have registered significant progresses in hunger reduction, but sub-Saharan Africa remains the region with the highest prevalence of undernourishment (FAO 2014). Cash transfers have been welcomed as an effective instrument to address undernutrition, because of their short-term *direct* effects in supporting household consumption of food. The question is whether households use resources from the transfers to increase their access to more quality food and whether, as a consequence, they achieve improved nutritional status.

On the other side, the long-term *indirect* effects of cash transfer programmes are also evaluated for their impact on beneficiaries' households labor supply. The labor market is crucial for poverty reduction, especially in sub-Saharan African countries, where poor people face important barriers to entry the formal labor market. There is an ongoing debate on whether the cash transfers unintentionally create dependence from the aid and produce a crowding-out effect on labor market supply (Bastagli 2010; Leibbrandt *et al.* 2013) or, on the contrary, they support initiative to generate other sources of income and sustain additional costs attached to the job seeking (Gertler *et al.* 2012; Barrientos and Scott 2008; Bastagli 2010). The question is relevant because, in order to achieve long-term objectives such as the reduction of vulnerability and the break of the intergenerational transmission of poverty, cash transfers should promote the labor market participation. To consider these indirect effects, we will exclude from our analysis those cash transfers programmes specifically targeted to labor market outcomes, such as those that attach work conditions (cash for work or credit-based self-employment).

With reference to food security, the case of South Africa is interesting because it highlights that food access is a serious concern in sub-Saharan Africa even in a middle-income country which is food self sufficient (Du Toit 2011). The groups most vulnerable to food insecurity in South Africa are typically those which have difficulties in earning a sufficient income from the labor market and those households with many dependants. Social grants address the lack of purchasing power of these households and are considered as an instrument to provide a basic income, particularly to the black majority of the population (Niño-Zarazúa *et al.* 2012). With reference to labor supply, South

African households largely depend from social grants as many individuals do not have labor market connections (Klasen and Woolard 2009). Thus, the questions that arise about the possibility that cash transfers disincentivize labor market participation become of primary interest in the case of South Africa, where unemployment rates are exceptionally high.

The literature about the effectiveness of cash transfers is wide, especially if referred to the conditional cash transfers implemented in Latin America. Indeed, during the 2000s, the Latin American conditional cash transfers have been widely analyzed to evaluate their role in addressing vulnerability and poverty reduction. A first generation of impact evaluations provides a strong and rigorous evidence from conditional cash transfers implemented in Latin America: the cases of PROGRESA-Oportunidades in Mexico and Bolsa Família in Brazil are the iconic cases of the success of these programmes in affecting school enrolment, preventive health check-ups, children's immunization and in improving food availability and beneficiaries' nutritional status as measured by anthropometric measures.¹

On the contrary, the evidence about unconditional cash transfers in sub-Saharan Africa is still building and still few studies clarify what are the mechanisms and theoretical pathways through which cash transfers are expected to reach development objectives.

This paper aims to reconsider, through a literature review, the cash transfers effectiveness in addressing food security and questions whether cash transfers discourage labor market supply or, on the contrary, support income-generating activities.

3. The case of South Africa: social protection and cash transfers

In South Africa, cash transfers (also called social grants) are social assistance instruments consisting in regular and predictable transfers, typically non-contributory and unconditional. They are stable and expected to continue indefinitely over time, sometimes with quasi universal targeting of vulnerable groups.

Cash transfers in South Africa are not only conceived to sustain poor households' consumption levels and protect them from external shocks, but also to pursue long term development objectives as equity promotion and racial integration (Niño-Zarazúa *et al.* 2012).

The Constitution of the Republic of South Africa (1996) declares that "*everyone has the right to have access to social security, including, if they are unable to support themselves and their dependants, appropriate social assistance*".

Developed under apartheid as a welfare state for whites, the end of Apartheid in South Africa gave urgency to introduce policies aimed at improving equity and integration (Niño-Zarazúa *et al.*

¹For a review about conditional cash transfers in Latin America see Rawlings and Rubio (2005), Fiszbein and Shady (2009), Bastagli (2010).

2012). The Government's 1997 White Paper on Social Development states that "*a social security system is essential for healthy economic development, particularly in a rapidly changing economy, and will contribute actively to the development process. It is important for immediate alleviation of poverty and is a mechanism for active redistribution*".

In 1992, the Social Assistance Act extended the social security measures to all South African citizens and, since then, the social protection system expanded relevantly (Woolard and Leibbrandt 2013). The core of the system is the implementation of a number of cash transfer initiatives aimed at breaking the intergenerational transmission of vulnerability and poverty by raising households' income and encouraging investments in health, education and nutrition.

The South African exceptional development of the social protection system, especially through social grants, can be seen in the African Union context that, since 2004, encouraged the development of a social policy framework in the African countries, recognizing the role of a social protection system in contributing to the economic growth and to the human capital accumulation, in alleviating poverty and in reducing inequalities. Indeed, from the 2000's, cash transfer programmes in sub-Saharan Africa have been progressively institutionalized. According to the World Bank, between 2000 and mid-2009 more than 120 cash transfer programmes were implemented in sub-Saharan African countries, ranging from emergency one-time transfers and unconditional noncontributory social pensions to conditional cash transfers (Garcia and Moore 2012), for an average expenditure of 1.7 percent of GDP (Gentilini *et al.* 2014).

After the end of Apartheid in 1994, South Africa enshrined a right-based approach to social protection, fully funded by the national government and now exceptionally widespread if compared with other middle-income countries (Garcia and Moore 2012). For these characteristics, South Africa is especially representative of the cash transfers evolution registered in sub-Saharan African upper-middle income and middle-income countries (which are principally the Southern African countries). These programmes were launched by a national government usually during the colonial era, perceive long-term objectives focused on poverty reduction and, to this aim, are targeted to vulnerable and poor social groups. This kind of experience is very different from the one registered in low-income and fragile states (which are principally the Eastern, Western and Central sub-Saharan African countries), where cash transfer programmes are generally more recent (launched after 2000) and implemented with the financial aid of international donors, have short term objectives specifically focused on food security, education, health and emergency response and thus are targeted to limited vulnerable groups (Garcia and Moore 2012; Niño-Zarazúa *et al.* 2010).

To date, the South African social assistance programmes, which amounts to 3.5 percent of GDP financed through general tax revenues collected on a national basis, is wider and more effective than in other African countries (Woolard *et al.* 2010). The benefits are provided in the form of monthly income transfers - adjusted each year to take account for inflation - to eligible beneficiaries. Eligibility is typically defined on a means test basis: incomes of those that apply for social assistance are evaluated to determine whether they lie under specific ceilings. Those ceilings consider whether the person is single or married.

Moreover, the grants are targeted to specific groups who are unable to earn their income from the labor market: *i)* the elderly, targeted by the Old Age Pension and the War Veterans Grant; *ii)* the children, targeted by the Child Support Grant, the Care Dependency Grant and the Foster Care Grant; *iii)* the disables, targeted by the Disability Grant and Grant in aid (Department Social Development 2010).

Table 1 provides an overview on these programmes, active in South Africa to date. It draws extensively from administrative information available from the South African Social Service Agency (SASSA), from Budlender and Woolard (2006) and Woolard *et al.* (2010) and from Duflo (2003) for what concerns the Old Age Pension in particular.

South African cash transfer programmes reach about 16 million people (out of a population of 53 million), that is more than a quarter of the population (SASSA 2014). The most widespread social assistance programmes are the Old Age Pension and the Child Support Grant. As a consequence, as reported in the following sections, the literature review about the South African cash transfers is particularly focused on these two programmes.

Since the post Apartheid, these grants registered a large increase in take up rates thanks to a number of interventions that have facilitated the social grants claiming, a progressive relaxation of the eligibility criteria (see for example the expansion in the age eligibility criteria for the Child Support Grant), the mitigation of initially required conditionalities (Woolard *et al.* 2010).

Indeed, during the 2000s there has been a gradual increase in the total number of grants: from 2006 to 2014 the number of benefits in payment increased of 45 percent, with an average annual growth of 5 percent (own calculations on data from SASSA 2009 and 2014). The increase was mainly driven by the Child Support Grant and the Old Age Pension, while the War Veterans Grant and the Disability grant decrease steadily.

The Old Age Pension is moreover important because of the generosity of the transfers: in 2010, the value of the grant was 75 percent higher than the median per capita income (Woolard and Leibbrandt 2013). The Child Support Grant is not that generous, but it can be cumulated for a total of six grants per caregiver. Thus, it still may represent an important source of income for poor households, accounting until the 40 percent of the median per capita income (Woolard and Leibbrandt 2013).

The seven aforementioned cash transfers programmes are, to date, unconditional. South Africa represents one of the clearest cases of the different evolution that sub-Saharan African cash transfer programmes have registered compared to the Latin American ones. Latin American cash transfers are conditioned to specific recipients' behaviors in order to perceive short-term objectives as income poverty reduction in combination with long-term development objectives as the improvement of education and health outcomes. Southern African schemes, instead, do not impose conditionalities constraints (Schubert and Slater 2006). The choice to not impose conditionalities to African cash transfers is principally explained by a supply side concern: African countries, because of the limited financial resources, encounter difficulties in meeting the additional demand and in sustaining the

additional administrative costs for educational and health services necessary to allow individuals to comply with conditionalities (Shubert and Slater 2006).

Interestingly, following the experience of conditional cash transfers introduced in Latin America, the South African Child Support Grant was initially conceived as a conditional cash transfer: applicants were expected to participate in development programmes and give proof of immunization for their children. Anyway, these programmes were not implemented in many areas and access to immunization was even harder for the more marginalized children that the grant intended to support. As a consequence, conditionalities were abolished because considered as barriers to receipt for many poor households (Budlender and Woolard 2006; Woolard *et al.* 2010). Since 2010, a “soft” behavioral condition was re-introduced and it is still in effect: it requires children to be enrolled and to attend school, but different thresholds are applied recognizing that access to educational, health and employment services is harder in rural areas than in urban ones. This is the only attempt in South Africa to impose conditionality on any of the non-contributory social assistance benefits (Lund 2011). But, as the punitive measures mentioned in case of non-compliance have not been enforced², the Child Support Grant is considered as an unconditional cash transfer.

The opportunity to reintroduce conditionalities to the South African social grants is still debated: while the positive effects include children’s health and education, which are long-term development objectives, concerns refers to the fact that conditioning grants would be against the right based approach to social assistance, granted by the South African Constitution of 1994 (Woolard and Leibbrandt 2013). Moreover, the “supply side problem” arises and it may be especially severe in rural areas, the more vulnerable since apartheid (Lund *et al.* 2009). Finally, control for compliances determines an increase of administration costs.

African countries have to overcome difficulties due to the high number of poor people living in the region, the reduced financial capacity and the small tax base, the marginalization of many rural areas that make it difficult and costly to collect information and reach potential beneficiaries. Then, even if there are some good practices that could be transferred from the Latin American to the African context, other lessons still must be learned. To this aim, the evidence about sub-Saharan African unconditional cash transfers - collected with rigorous methodologies and credible counter-factual - is still building.

The case of South Africa that this paper aims to analyze will provide a number of insights for unconditional cash transfers effectiveness in sub-Saharan African countries.

²If the child failed to be enrolled or to regularly attend school, the Child Support Grant would be suspended. Following urgent submissions from children’s sector and human rights groups about the implications of these conditionalities, the conditions were softened.

Table 1: *Cash transfer programmes in South Africa*

South African social grant programmes	Targeted population (as at 2014)	First launch and main changes since first implementation	Amount (in Rands as from 1st October 2014)
Old age pension	Men and women aged 60 and older who earn less than R61,800 a year or have a combined household income of less than R123,600 a year.	The social pension, first introduced in 1920's for Whites, was extended to the whole population from 1993 on. Benefits were gradually increased and the means tests were unified across races.	R1,370 per month for people over 60, R1,380 per month for beneficiaries older than 75 years.
War Veterans Grant	People who are disabled or older than 60 and who served in the country military in early and mid 20th century wars.		R1,370 per month.
Child Support Grant	Children aged less than 18 years, whose caregiver earns less than R38,400 (if single) or R76,800 (combined income if married) per year. Given for a maximum of six children per caregiver.	Launched in 1998, it was progressively extended through: a progressive expansion in eligibility related to the child age (from aged under 7 to aged under 18); an amount increase (from 2010, it is progressively adjusted for inflation); the relaxation of means tests (from a household based measure to one which consider the caregiver personal income plus that of her/his spouse); the mitigation of conditionalities initially required.	R320 per month.
Care Depend-ency Grant	Children with a permanent, severe disability, whose caregiver earns less than R162,000 (if single) or R324,000 (combined income if married) per year.	Launched in 1998.	R1,370 per month.
Foster Care Grant	Children up to the age of 18 years "in need of care" and who are not receiving such care from their biological parents (children abused, children in trouble with the law).	Launched in 1998, is to date considered as the more appropriate grant for those children orphaned by HIV/AIDS. Registered increases in take up rates over years, partly as result of the HIV/AIDS pandemic.	R830 per month.
Disability Grant	People aged between 18 and 60 and 65 for females and males respectively, who are unable to work because of disability. Means test: the same of the Old Age Pension.		R1,370 per month.
Grant in aid	Temporary grant in aid, for people receiving the Grant for Older Persons, Disability or War Veteran's Grant, and who require full-time care because of physical or mental disability.		R320 per month.

4. Cash Transfers for food security

Food security is a concern in sub-Saharan Africa, where one in four people remains undernourished (FAO 2014): lack of adequate education and poor health, exposure to unsafe living conditions, nutritious deficits particularly for children, low income, unemployment and underemployment as well as recurrent famines, low agricultural productivity, food price volatility, environmental degradation and climate change exacerbate the vulnerability of people.

Cash transfers programmes in developing countries have been welcomed during the past decade as an instrument to eradicate poverty and also as a cost-efficient alternative to food aid in humanitarian contexts (Holmes and Bhuvanandra 2013). Indeed, during the 1990's, food aid began to be strongly criticized, mainly because of difficulties and expensiveness linked to the storage and distribution, competition with local production and paternalism underlying this type of policy (Sabates-Wheeler and Devereux 2010). Cash transfers, on the other hand, provide a more stable and recurrent support compared to food aid, which may allow to pursue also long-term development objectives (Garcia and Moore 2012).

The effectiveness of cash transfers in addressing food security is nevertheless still debated³: questions regard whether these transfers are significantly increasing food consumption levels and whether consumption gains are translated into improved nutritional status and health for the household members.

After a review of the theoretical background that underlies the link between cash transfers and food security, this section will present the evidence collected in South Africa and question whether the theoretical pathways and mechanisms are actually realized. But let us first consider the definition of food security that will guide our analysis.

4.1. Defining food security

The term “food security” evolved over time. It was originally used at a country level and described whether or not the availability of food was enough to meet the aggregate demand for food (at whatever price). In the second half of the 1970's, the term “food security” began to focus on the demand side of the food equation rather than on the supply side, shifting from the concept of food “availability” at macro-level to the concept of food “access” at micro-level (Burchi and De Muro 2012).

Amartya Sen, with his work “Poverty and Famines” (1981) was a pioneer of a theory focused on “access” to food rather than “availability”: he argued that hunger is generally not caused by a shortage in food supply but by an “entitlement failure”, that is the inability of individuals and

³For an evaluation of the effects of cash transfer programmes introduced during the 1990s and the 2000s on food security in a sample of sub-Saharan African countries, see d'Agostino *et al.* (2013).

households to access food because of markets' failures, unclear institutional rules, discriminatory practices (Conceição *et al.* 2012; Burchi and De Muro 2012).

In 1989, "Hunger and Public Action" by Drèze and Sen, developed the "capability approach" to food security that focuses on enlarging human choices and that conceptualizes food security on a clear human development perspective, which is seen as multidimensional and people centered. The basic capability of "being free from hunger" refers to the access to enough calories for survival, in a stable manner. Enjoying this basic capability is necessary but not sufficient to realize the capability "to be food secure": indeed, a diversified and quality diet results from the interaction between the basic capabilities "being free from hunger", "being educated", "being in good health" and "being empowered" and is moreover conditioned by the food use and the cultural and religious norms (Conceição *et al.* 2012; Burchi and De Muro 2012).

Following the human development perspective, food security was defined as access by all people to enough food to live a healthy and productive life. The 2009 Declaration of the World Summit on Food Security provided a more specific definition: "*Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food, which meets their dietary needs and food preferences for an active and healthy life*".

This definition allows to identify four food security dimensions: *i*) access to food, *ii*) food availability, *iii*) food utilization and *iv*) stability over time (FAO 2013).

The "*food access*" dimension focuses on three pillars that entitle individuals to acquire appropriate foods for a nutritious diet: the physical, social and economic access. The physical access depends on the availability and quality of infrastructures, food storage facilities, markets' functioning; the social access depends on the ways food is acquired and consumed; the economic access depends on disposable income, food prices and the provision of social support (as cash transfers) (FAO 2013).

The "*food availability*" dimension refers to sufficient quantities of food with appropriate quality, and mainly concerns the supply side (production, imports or food aid) at national level. The reference to a "*safe and nutritious food*" emphasizes the food quality and diet composition and the reference to "*food preferences*" includes the concept of availability of food preferred according to social, cultural, religious and ethical values (Pinstrup-Andersen 2009).

The "*food utilization*" dimension points to the households' use of the food to which they have access, considering also the intra-household dynamics and the individuals' capacity to convert food in nutrients, so to reach a state of nutritional well being where all physiological needs are met and so to live an active and healthy life.

The "*stability*" dimension identifies the measure and extent of exposure to risk over time, that makes household vulnerable to shocks or cyclical events (FAO 2013).

4.2. Theoretical pathways and mechanisms

Cash transfers targeted to the extreme poor in monetary terms and to the more vulnerable people⁴ are considered as one of the main policy instruments to reduce food insecurity in sub-Saharan Africa. The literature suggests several pathways through which cash transfers should affect food insecurity. The question is then whether cash transfers affect the four dimensions of food security, under what assumptions, and through what kind of mechanisms.

First, cash transfers may affect the access to food by addressing the lack of purchasing power of poor households (Alderman 2014). Under the assumptions of food availability on the local markets and of affordable food prices, cash transfers generate an income effect at the household level. In line with Sen's approach of "entitlement to food", cash transfers provide the necessary income to access food through the market. In a neoclassical consumer theory, the cash transfer, if considered differently from other income sources, shifts out the household (food) budget constraint and the food Engel curve, while, if considered as another source of income, it changes the household expenditure composition moving it along the food Engel curve (Gentilini 2007; Fiszbein and Shady 2009).

There is available evidence that cash transfers directly increase households' food expenditure and that low income families pooled grant money with other income sources to meet their broader needs. According to Fiszbein and Shady (2009), households that receive conditional cash transfers in Colombia, Ecuador and Nicaragua, independently from their initial level of total household expenditure, tend to consume a higher proportion of food. Adato and Basset (2012) review the evidence of the unconditional cash transfers programmes implemented in South Africa, Kenya, Namibia, Zambia, Mozambique and Malawi. They find out that cash transfers increase food expenditure and food consumption, with shares going from 25 percent to 70 percent of total expenditures, higher than expenditure for clothing, transports and other basic services as water and electricity.

With reference to the dimension of "food availability", the effects are less direct: cash transfers may provide a greater stability and security for investments through the relief of credit constraints for poor households, the securing of loans and the need of collaterals removal (Barrientos 2012). Among these investments, those in agricultural inputs and in micro-entrepreneurial and farm production activities may affect food availability on the local markets (Gertler *et al.* 2012; Barrientos and Scott 2008). For example, Covarrubias *et al.* (2012), in analyzing the case of the Malawian Social Cash Transfer Scheme using longitudinal data from 2007 to 2008, find that recipient households manage to invest at least part of the transfers in family businesses, which are mostly subsistence agricultural activities.

The value of the transferred amount has a role, as well as its predictability over a long period of time and its regularity: if the grant is sufficiently high and its receipt is regular and stable over

⁴Sub-Saharan African cash transfer programmes target specific vulnerable groups with physical disabilities, illnesses (e.g. persons with HIV/AIDS), old age or groups affected by natural disasters. These typically are conditions that may be serious sources of capability handicap (Sen 1999).

time, cash transfers can allow immediate food consumption, but can also incentivize investments in productive assets (Barrientos and Scott 2008).⁵ In the long term, these productive activities may activate a virtuous cycle that reduce households' dependence from the grant and stimulate consumption as a result of the return of investments (Gertler *et al.* 2012). According to Barrientos and Scott (2008), who analyze the cases of Brazil and Bangladesh, these effects are observed to be higher when transfers directly target credit constrained individuals and reach rural areas with deficits in complementary productive assets.

The income effect derived by the cash transfer could improve access to more quality food and allow for a more diversified diet, affecting the "food utilization". Focusing on the household level, the hypothesis behind the link between cash transfers and food utilization is that: *i*) households prioritize in favor of higher quality food, *ii*) households are able to acquire it depending on the cost of food, non-food items and other services; *iii*) resources are spent according to the household components needs.

The expectation of an improvement in food utilization raises also through the consideration that cash transfers are often targeted to children and received, managed and spent by their mothers or other women in the household. Previous evidence about gender and intra-household resource allocation suggests that women are most likely to use resources for childcare, food expenditure and other basic needs (Bassett 2008; Hoddinott and Bassett 2008). Thus, by assuming that women are empowered thanks to the transfer receipt as they gain financial autonomy and control over resources (Molyneux 2009), transfers to women can shift household consumption to child-related goods and basic services (Barrientos and Scott 2008; Holmes and Bhuvanandra 2013).

Switching from the household to the individual level, if recipients are able to convert acquired food in nutrients, as Hoddinott and Yohannes (2002) state, a more diversified diet would lead to improved outcomes in food security and health status (i.e. micro-nutrient intake, child anthropometric status).

Finally, cash transfers may affect the "stability" of food security: cash transfers aim at reducing vulnerability to external shocks, need for help and intergenerational transmission of poverty (Samson 2009). Thus, if cash transfers are regular and predictable, they can help in coping with shocks as drought or floods and in smoothing seasonal fluctuations. They can promote productive activities (as already seen) and mitigate eventual downside consequences of high-risk investments (Samson 2009).

Figure 1 shows synthetically which are the theoretical pathways and mechanisms discussed above that link the cash transfers receipt to the four dimensions of food security.

⁵Nevertheless, if the increased demand for food is not compensated by an increase in food supply in the local markets, cash transfers may produce a raise in food prices. See Kebede (2006) for an analysis on the appropriateness of cash transfers in contexts - such as the Ethiopian one that he analyzes - where cash transfers may increase demand but the local supply respond too slowly, causing an increase of food prices.

4.3. Evidence on South Africa

Food insecurity in South Africa remains widespread, despite the rapid economic growth and the social policies which have led to steady progresses in reducing income poverty (Leibbrandt and Levinsohn 2011; Leibbrandt *et al.* 2011) and even if it is a food self-sufficient country that can produce almost all the major food products and import when necessary (Du Toit 2011).

Indeed, 35 percent of the population in South Africa is estimated to be vulnerable to food insecurity (Kirsten 2012), 20 percent of the households have inadequate or severely inadequate food access (Du Toit 2011), and about 25 percent of children under age of 6 are classified as stunted by malnutrition (Manyamba *et al.* 2012). The insufficient access to food, especially in rural areas, is due to structural income poverty and income inequality dynamics (Manyamba *et al.* 2012). Moreover, the present configuration of poverty still bears a strong racial footprint as a legacy of the apartheid policy and the disadvantaged groups are highly skewed by race and gender (Aliber 2001).

The groups most vulnerable to food insecurity in South Africa are typically characterized by few income earners and many dependants and often rely on social grants to have access to sufficient food. Cash transfers in South Africa, as seen in the *Section 3*, are in fact targeted to those groups unable to earn their income from the labor market (the elderly, the children, the disabled). According to Leibbrandt *et al.* (2012), cash transfers increase the share of total household income from 5.4 to 7.9 percent, also in real terms. The empirical evidence tried to explore whether the income from cash transfers is redistributed within the household and shared intergenerationally according to the components' needs.

Duflo (2003), using data from a national survey of randomly selected South African households during the last five months of 1993, estimates that in households with Old Age Pension recipients, resources from the grant are invested in children's health and nutrition, especially girls, having a positive impact on their anthropometric measures. Nevertheless, she argues that South African households do not seem to act as a unitary entity: her results are significant only when the recipient is a woman. Case (2001) - using data from the Langeberg Survey, a randomized survey of 1,300 individuals in 300 households - finds that resources coming from the Old Age Pension are pooled in the household improving the health status of all household members, particularly that of children: she finds that the social pension is associated with an increase in child height and with an increase of one standard deviation in height for age.

South African cash transfers produce an income effect in the household that may be spent on basic needs, as food.

Indeed, Booysen and van der Berg (2005), using panel data from 351 households in the Free State province from 2001 to 2002, find that grant recipients (in particular old age pension and disability grant recipients) increase households' food expenditure. Moreover, they find that income from cash transfers is more likely than other sources of income to be employed to increase food purchase.

But this result is not consistent with the previous result find by Case and Deaton (1998): using a 1993 nationally representative survey and regressing food expenditure data on income excluding the social pensions and on pension income only, they find out that social pension recipients spend the pension income in the same way as other income sources.

Delany (2008), by implementing an original survey of households in low-income areas in 2007 and with reference to the Child Support Grant, estimates that beneficiary households allocate a larger proportion of their expenditure to essential goods such as food.

The purchase of more food is associated to children's hunger reduction: Williams (2007) - using data from the General Household Survey of 2002, 2003, 2004 and 2005, from the Labor Force Survey of 2004 and 2005 and from the National Treasury 2005 and 2007 - finds that children in households that receive the Child Support Grant more probably suffer less hunger. Consistently, Samson *et al.* (2008), using data from a household panel constructed by the EPRI (Economic Policy Research Institute) from repeated cross-sections extracted from the National General Household Surveys from 2002 to 2004, show a reduction in self-reported hunger for children in beneficiary households.

The increase in food expenditures could also be associated with an increased access to more quality food and in a diet diversification, thus resulting in an improvement of nutrition.

Grobler (2013) analyzes dietary diversity of cash transfers receiving households compared to non-grant recipient households in low-income townships of the province of Gauteng, in 2013. He finds that recipient households have a more varied diet, but he argues that the grants amounts are not sufficient to ensure food security at a household level.

Agüero *et al.* (2006) use data from the KwaZulu-Natal Income Dynamic Study (1993, 1998 and 2004) and assess that the Child Support Grant has bolstered childhood nutrition as measured by child height-for-age. They find that this positive impact largely depends on the age the child begins to receive the grant and the regularity of the benefits: if the child receives the grant for more than half of the time during the first three years of life, the effects are more significant.

Coetzee (2013) using data from the first wave of the South African National Income Dynamic Study (NIDS 2008) evaluates the impact of the Child Support Grant on children aged less than 14 years on health, nutrition and education. She finds only small positive effects on the well being of the beneficiary children.

To the best of our knowledge, evidence about the association between cash transfers and investments in agricultural assets and activities, as well as between cash transfers and access to credit, is scant and referred only to the Old Age Pension. This is principally explained by the differences in the amount of grant: while the Old Age Pension is generous enough to allow immediate food consumption, but also to incentivize investments in productive assets (as seen in *Section 3*, it is much more higher than the median per capita income, thus sometimes it may also be higher than the wage the pensioner ever received during his/her working age), the Child Support Grant is not that generous, but it still may represent an important source of income for poor households if

received for more than a child and cumulated.

Ardington and Lund (1995) and Cross and Luckin (1993) (cited in Lund 2002, p. 684) show that the Old Age Pension, as very reliable, enable people - and in particular rural beneficiaries - to secure credit, hire equipment, buy improved agricultural inputs during all the agricultural production phases (plowing, planting, weeding and harvesting). The regularity, reliability and predictability over a long period of time of the pension receipt play a fundamental role in assuring a stability to the household income, in enabling them to plan for the future, in facilitating saving and having access to credit (Lund 2002).

As a consequence, cash transfers may reduce chronic income poverty and protect households from external shocks. To break the vicious cycle of poverty transmission is indeed the ultimate goal of these programmes. Twenty years after the end of Apartheid, according to Woolard *et al.* (2010) and van der Berg (2010), cash transfers have proved to be a redistributionist instrument that helped reducing poverty at an aggregate level.

5. Cash Transfers and labor supply

The theoretical pathways that link cash transfers and labor supply are ambiguous and also the empirical evidence finds contrasting results on the effects of cash transfer programmes on labor market's outcomes. One of the main criticisms made to cash transfer programmes is that they may create dependence from the aid and discourage labor supply (Bastagli 2010; Leibbrandt *et al.* 2013). Nevertheless, cash transfers have been also welcomed as a long term development instrument aimed at reducing households' vulnerability and breaking the intergenerational transmission of poverty: as cash transfers are a secure source of income, they may encourage income generating activities (Gertler *et al.* 2012; Barrientos and Scott 2008). The question about potential outcomes of cash transfers on labor supply is then still debated and the existing empirical findings on the subject are far from conclusive.

This section aims at revisiting the theoretical pathways and mechanisms that link transfers and labor supply, the assumptions that underlie them and reviews the empirical evidence on South Africa.

5.1. Theoretical pathways and mechanisms

The criticism made to cash transfers and referred to a discouragement effect in labor supply lies on a huge literature on work incentives principally based on the standard consumer theory and, in particular, on static models that considers two effects generated by the cash transfers receipt: an income effect and a price effect (Moffitt 2002).

The income effect generated by a cash transfer leads to increased consumption levels: an individual

maximizes his utility, given a budget constraint, and chooses between work and leisure. The cash transfer shifts out the budget constraint and the household consumption increases for all normal goods. If leisure is considered as a normal good, cash transfers determine an increase in leisure consumption and a reduction of hours of work supply (Fiszbein and Shady 2009; Leibbrandt *et al.* 2013).

The first assumption that underlies the standard consumer theory is that a person may work as much as he/she wants. The second assumption refers to leisure as a normal good. This assumption has been criticized because leisure unlikely can be considered as a normal good in the case of poor households, which generally are the cash transfers' target: if households are not able to satisfy their basic needs for food, water and clothing, then, their income elasticity of leisure is very low (Mideros and O'Donoghue 2014). An exception to this reasoning occurs when a grant is sufficiently high to guarantee, on one side, the minimum consumption level of basic goods and, on the other side, to allow the beneficiary to assign time for leisure reducing work (Mideros and O'Donoghue 2014).

The price effect generated by a cash transfer receipt depends on the programme's targeting mechanisms: if the cash transfer is means tested, potential beneficiaries may reduce their labor supply in order to fall below the specified income threshold and become eligible for benefits (Moffitt 2002; Fiszbein and Shady 2009).⁶ According to Sen (1999), targeting mechanisms that focus on capability deprivations (e.g. physical disabilities), rather than on income, have an advantage in preventing incentive distortions for at least three reasons: *i*) people may typically be reluctant to deprive themselves of education, health or other basic capabilities in order to qualify for grants; *ii*) functional deprivations are often beyond the control of potential beneficiaries; *iii*) individuals focus more on functioning and capabilities achieved than to just earning money.

The critics referred to a labor supply discouragement have often been addressed by considering the potential of cash transfers as social protection instruments. Grounded in a development theory, social protection has the role to lift constraints to human end economic development posed by social risk (Barrientos and Hulme 2009).

In developing countries, the primary pathways by which transfers correct market failures that limit investments in income generating activities and trap people in subsistence labor are the alleviation of liquidity and credit constraints. The reliability over time and the perception as a secure source of credit has a role: transfers allow households to improve the management of social risk and to grant access to capital, allow a livelihood security and thus incentivize investments in productive assets and the engagement in informal labor markets or in self-employment activities (Gertler *et al.* 2012; Devereux and Sabates-Wheeler 2008; Blattman *et al.* 2013).

As a consequence, cash transfers may have a positive effect on labor supply thanks to their protective and productive nature. Moreover, in the long term, the virtuous cycle produced by return of

⁶Introducing the dynamics in these models, other aspects such as the intertemporal wealth effects can be considered: they also may reduce labor supply simply because they increase the non-labor income (Moffitt 2002).

investments that stimulates effective demand may produce positive externalities on the whole community (Barrientos 2012). The point is to reinforce the relationship between economic growth and the community's ability to deal with social and economic uncertainty by improving the resources' allocation (Barbone and Sanchez 1999).

To the best of our knowledge, while evidence about conditional cash transfers in Latin America is wide⁷, the evidence about the effect of unconditional cash transfers in sub-Saharan Africa on labor supply is scant and it is mainly referred to the South African case, which we will analyze in *Section 5.2*.

According to Covarrubias *et al.* (2012), which analyze the economic impacts of the Malawian Social Cash Transfer Scheme using longitudinal data from 2007 to 2008, even the poorest and subsistence oriented households manage to invest a portion of the transfers in their family businesses.

Blattman *et al.* (2013), by analyzing the case of Northern Uganda and using a model of occupational choice, test the role of credit constraints on employment creation and evaluate the role of unconditional cash transfers in alleviating those credit constraints: they find that underemployed youth aged 16 to 35, especially women, invest more in training and business assets, increasing investments returns.

The reallocation of time and resources within the household is also relevant in evaluating the effect of unconditional cash transfers on labor supply, but without clear effects.

On the one hand, cash transfers may induce a change in household composition: some household members, especially the young living in rural areas, may be enabled to migrate in search of work by the alleviation of liquidity constraints associated with transports and job seeking (Posel, Fairburn and Lund 2006). Looking for a job is in fact a costly activity and an exogenous income may increase the chances to find a job and, moreover, may enable people to look for better work conditions: as the reservation wage increases, they can wait for better job offers and higher remunerations (Soares 2012; Wittemberg 2002). Skoufias and Maro (2005), by evaluating the PROGRESA program of Mexico, find some evidence that, right after they started receiving the transfer, individuals use a part of it to seek work in salaried activities and reduce their participation in less profitable family businesses, even if this impact disappears in the long period.

When grants are received by women, in particular, the literature suggests that women may be empowered by the control over resources, by the consequent increased role in household decisions

⁷According to Fiszbein and Shady (2009), the empirical evidence about conditional cash transfers from Cambodia, Ecuador, Mexico and Nicaragua does not confirm an effect of reduction in labor supply from beneficiary adults. On the contrary, in some cases as the one of Bolsa Família in Brazil, Chile Solidario and Jefes de Hogar in Argentina, an incentive effect on labor market participation rate of treated adults is found. The theory behind the effectiveness of conditional cash transfers in addressing labor supply is principally explained by the type of conditionalities attached to the benefits: conditionalities as school attendance or health checkups led to an improvement in education and health conditions in the long run, which determines human capital accumulation and therefore create a positive impact on labor market outcomes (Leibbrandt *et al.* 2013).

and, especially in the case of unconditional cash transfers, by the opportunity to choose ways to utilize resources in their household (Siegmann and de Haan 2011). As suggested by the Amartya Sen's (1999), women's voice and agency is strongly influenced by their ability to earn an independent income. As women may use cash as per their own choices and decisions, they may also be incentivized to going outside the home for earning income and increase their independence and bargaining power in the household.⁸

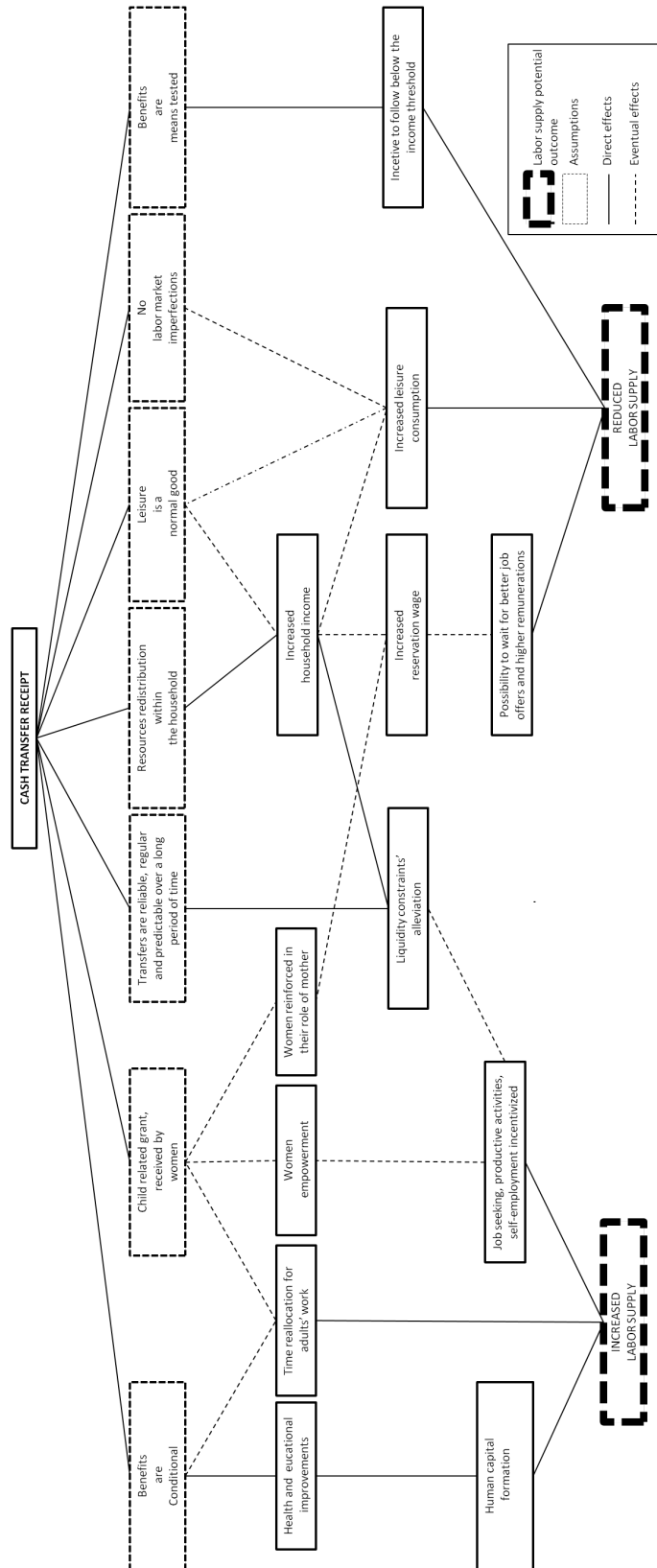
The household components may also make an intertemporal choice: social pension potential recipients may withdraw from the labor market when the age of retirement is reached (Barrientos 2012), engage in child care responsibilities and allow young members - especially young mothers - to increase their labor supply. When grants are instead targeted to children having an effect on their school attendance, time previously used for child care can be allocated for work; second, because of a reduction in child labor, adults increase their labor supply to compensate for the reduction of income (Barrientos 2012).

On the other hand, the increase in reservation wage may encourage especially young people to remain in the household where there is, for example, a social pension recipient (Duflo 2003; Leibbrandt *et al.* 2013) and thus discourage labor supply.

Figure 2 shows synthetically which are the theoretical pathways and mechanisms discussed above that link the cash transfers to potential labor supply outcomes.

⁸For a review on the intra-household gender relations and women's agency and empowerment, see Sen (1999) and Kabeer (2005).

Fig. 2.— Theoretical pathways from cash transfers to potential labor supply outcomes



5.2. The South African labor market

The South African labor market statistics follow the international guidelines set out by the International Labor Organization for measuring employment. Thus, the South African working age population - defined as those aged between 15 and 64 years - is composed by the labor force and by the not economically active persons. In turn, the labor force is composed by the employed and by the “strictly” unemployed.

The employed - defined as those engaged in market productive activities in the week prior the survey interview (even if only for one hour) - represent the 42,8 percent of the South African working age population (Stats SA 2015) and account for the largest share of the working age population amongst the men (48,9 percent), the white population group (62,6 percent), the aged 35-44 years (63,41 percent) and those that reside in provinces such as Gauteng and Western Cape (51,7 and 52,4 percent respectively) (Stats SA 2015).

On the contrary, the unemployed represent 25,1 percent of the South African working age population (Stats SA 2015) and especially affect the traditionally most disadvantaged segments of the population as African (28,1 percent), Coloured (24 percent), those that reside in the poorer provinces and in remote rural areas (Banerjee *et al.* 2008; Yu 2008; Stats SA 2015) (see *Table 2* for more statistics differentiated by gender, population group, province of residence, age group).

Reported statistics are based on a “strict” definition of unemployment that considers the unemployed as those who wanted to work, were available to start working within a week and also had actively looked for work during the four weeks preceding the interview. It thus excludes the discouraged work seekers: persons who wanted to work but did not try to look for work or start a business. Since the early 80’s, it has been widely debated whether the South African unemployment statistics based on the “strict” definition reflect labor force participation or real unemployment. The point is that, by applying a strict definition of unemployment, measures underestimate unemployment rates as the discouraged work seekers are assumed to have voluntarily exit the labor market, choosing leisure above employment and thus becoming not available for work (Sender 1996; Kingdon and Knight 2004).

On the contrary, in a country as South Africa where the unemployed according to the broad definition represent 35 percent of the working age population, the discouraged work seekers are mainly those that have given up hope of finding work: they believed that there were no jobs available in their area, or were unable to find jobs requiring their skills, or they had lost hope of finding any kind of work. They account for the 15 percent of the not economically active persons (Stats SA 2015) and are principally discouraged by the barriers to enter the labor market, even in the informal sector: the lack of infrastructures as transports, the inadequate access to credit markets, the high costs of job seeking (Burger and Woolard 2005).

The legacy of apartheid still has a role in explaining these exceptionally high unemployment rates, that to date represent a structural problem within the South African economy.

According to Banerjee *et al.* (2008), the unemployment rates during apartheid were substantially lower and doubled after the transition to democracy: between 1995 and 2001, unemployment rates raised from 15.6 percent to 30.3 percent. Only from 2003 to 2008, unemployment rates declined to reach the minimum (21,9 percent), thanks to absorption rates exceeding growth in new entrants to the labor market. But, after the global financial crisis in 2008, unemployment rates rose again.⁹ The negative annual growth by the end of 2009 has a role, but this evolution is firstly explained by an increased labor supply, mainly from African and particularly from African women.

First, after the end of apartheid, the African's educational attainments raised and the migration to the urban areas where there are more job opportunities increased (Burger and Woolard 2005).

Second, specific Affirmative Action policies encouraged black people to participate in the labor market. In 1998, the Employment Equity Act aimed at redressing discrimination in the labor market by eliminating unfair discrimination and by taking positive affirmative measures to attract, develop and retain individuals from previously disadvantaged groups. In 2004, the Broad-based Black Economic Empowerment Act aimed at promote the *“economic empowerment of all black people, including women, workers, youth, people with disabilities and people living in rural areas”* through human resource development, ownership and control of businesses and assets, enterprise development and preferential procurement (Burger and Jafta 2010).

Third, since the 90s, the African job market registered a “feminization” principally explained by an increase in female education, a decline in number of married women and of women living with men and a decrease in fertility rates (Casale and Posel 2002). The labor force participation of women expanded relevantly from 38 percent in 1995 to 46 percent in 2004 (Ntuli 2007). To date, the labor force participation rate of women is of 50,7 percent with an absorption rate of 36,9 percent (Stats SA 2014).

Last, from 1996 on, the post-apartheid government recognized the urgency to address unemployment and applied a comprehensive employment strategy based on a massive expansion of the public works programmes. The aim was to absorb labor force participants that unlikely find an employment in the open labor market because unskilled or low-skilled (McCord 2004). Thus, in 2004, the government launched the Expanded Public Works Programme with the aim to generate temporary work opportunities and skills training for at least one million people between 2004 and 2009 in the infrastructures, environmental, social and non-state sectors. The second phase of the programme covers until 2014 and aims to create 4.5 million work opportunities.

Despite these policies, the new entrants in the labor market were not completely absorbed.

The public work programmes, in 2003, absorbed only the 1,5 percent of the African and Coloured unemployed (Aliber 2003).

⁹The labor absorption rate, or employment-to-population ratio, is defined as the proportion of the working-age population that is employed.

Women remain principally self-employed in the informal sector, employed in domestic work or unskilled occupations or spend most of their time in unpaid work, often related to their childcare responsibilities. As a matter of fact, women register unemployment rate 5,4 percent higher than men (Stats SA 2012) and, when employed, their average earning is 75 percent of that of a men (Posel and Rogan 2009).

These historically disadvantaged social groups are hardly absorbed by the labor market, principally because of a low level of skills. The South African labor market, from the end of apartheid on, reopened its economy to the international market: as a consequence, it changes its structure in favor of export-producing firms, with a small net effect on total employment and a within-industry shift towards more skilled workers. Moreover, the mining and agricultural sectors shrink, experiencing a large decline in employment shares, especially of unskilled workforce (Burger and Woolard 2005).

Table 2: *Labor market statistics in South Africa*

	Unemployment rate (%)	Employment rate (%)	Labor force participation rate (%)
Working age population	25,1	42,8	57,1
By gender			
Women	27,2	36,9	50,7
Men	23,3	48,9	63,7
By population group			
African	28,1	39,5	54,9
Coloured	24,0	49,4	65,0
Asian/Indian	12,0	51,7	58,7
White	7,4	62,6	67,6
By province			
Western Cape	22,7	52,4	67,8
Eastern Cape	29,6	33,1	47,0
Northern Cape	29,9	40,5	57,8
Free State	34,1	40,3	61,2
KwaZulu Natal	22,3	37,6	48,4
North West	24,9	51,7	68,8
Mpumalanga	29,0	41,9	58,9
Limpopo	16,5	34,2	40,9
By age group			
15-24 years	51,3	12,3	25,3
25-34 years	30,1	51,0	73,0
35-44 years	19,1	63,1	77,9
45-54 years	13,4	61,1	70,6
55-64 years	7,7	40,6	44,0

Notes: unemployment rates are calculated according to the strict definition of unemployment.

Source: Labour market dynamics in South Africa, 2014 (Stats SA 2015).

5.3. Evidence on South Africa

In conventional welfare states, risks related to ageing, unemployment and health have been covered mainly by social insurance and means-tested social assistance: under the assumption of full-employment, as individuals in working age and available to participate to the labor market have the potential to generate the necessary income, social assistance is conceived as an exceptional and temporary instrument to provide protection from risks not covered by social insurance (Makino 2004; McCord 2009). However, in many developing countries full employment is difficult. In South Africa, as seen in the previous Section, unemployment rates are very high and the historically disadvantaged social groups (as African, women, rural people) are more vulnerable to long periods of unemployment.

The only social assistance instrument provided to the unemployed in South Africa, to date, is the Unemployment Insurance Fund (UIF). The UIF pays benefits to contributors or their dependents in instances of unemployment, illness, death, maternity and adoption of a child in case of employment loss, providing a short term protection from frictional or cyclical unemployment. It is in fact not effective in addressing the large scale structural unemployment problem: according to Woolard *et al.* (2010), only about one in every ten unemployed persons receive the UIF benefits. This is explained by the fact that: 55 percent of the South African unemployed never worked before and thus have not contributed to the UIF. Unemployment in South Africa tend to be longer than the 238 days covered by the insurance, especially for the traditionally disadvantaged social groups; many labor opportunities still remain in the informal sector.

Cash transfers, on the contrary, are targeted, as seen, to social groups that are unable to raise an income from the labor market (the elderly, the children, the disables) and thus depend on other family members.

As a consequence, African households with many dependents largely rely on social grants, which may represent up to the 60 percent of their income sources (Klasen and Woolard 2009). For the bottom quintile of the income distribution, two thirds of the income comes from grants (Woolard *et al.* 2010).

At least a share of the cash transfers reaches some groups that were not originally targeted by the programme and principally through resources redistribution within the household (Bertrand *et al.* 2003)¹⁰. Indeed, South African households are generally large and characterized by a three generations composition. As a consequence, there is a high potential for spillover effects within the family (Abel 2013).

Thus, the question on whether social grants in South Africa led to a long term dependence on social assistance and disincentivize beneficiary households' members to work is relevant.

¹⁰For a review about intra-household resources redistribution see *Section 4.3* and Duflo 2003; Case 2001 and Lund 2002.

The literature review that follows thus focuses on the indirect effects that those social grants may produce on labor supply. The evidence is principally related to the two most widespread cash transfers: the Old Age Pension and the Child Support Grant. As the social pension is more ancient, the available evidence about the impact of the Old Age Pension is wider than that about the Child Support Grant.

According to Lund (2002), the Old Age Pension has a role in securing credit, renting capital equipment and investing in agricultural assets and productive activities. Thus, the social pension is found to contribute to small businesses formation and to local markets development and, as a consequence, in raising employment and self-employment opportunities.

Bertrand *et al.* (2003), using a primary dataset collected in 1993 from a random sample of 9,000 households, test the income pooling inside the household to analyze the impact of the Old Age Pension receipt on prime-age household members. They find a reduction in the labor supply of prime-age workers as measured by working hours when the old person in the household turns the age for retirement. This effect is especially high when the pensioner is a woman and among the women prime-age workers. According to Bertrand *et al.* (2003), this is an unintended effect of the social pension, as the affected groups are not those initially targeted by the programme.

According to Banerjee *et al.* (2008), these unintended effects are also due to the social pension generosity, that discourage job seeking among the under 35 which put little effort in searching activities as long as they can count on the support of the elders.

This argument is confirmed by the empirical evidence provided by Ranchhod (2009): using the panel components of the Labor Force Survey from September 2001 to March 2004, he finds that the loss of a pensioner, either due to out-migration or death, generates an increase in labor force supply, particularly by adult women.

Abel (2013) analyzes the impact of the Old Age Pension on labor market participation of prime-aged workers living in the same household of the social pension recipient, using the first two waves of the National Income Dynamic Study (2008 and 2010/2011). He finds a negative causal effect of the pension on salaried and self-employment. In particular, the study finds that the pension is associated with a lower probability for unemployed adults in the household to find a job and, further, with an increased probability for employed adults of losing their work.

Other studies find the opposite result, which is an increased labor supply.

Posel *et al.* (2006) replicate the study done by Bertrand *et al.* (2003) but consider households differently: indeed, when considering non-resident household members, they found that the negative relationship between social pension and labor supply turns to be positive. Social pension are thus found to have a role in facilitating migration of household members to find work. This effect is particularly significant for rural African women, while it is not for men.

Ardington *et al.* (2009), using longitudinal household data collected from 2000 on in a district in the northern KwaZulu-Natal, also find that the Old Age Pension receipt leads to increased

employment among prime-aged members in the household. They speculate that the social pension, as generous and stable, allows prime-age workers to migrate for work leaving childcare responsibility to the elders. The assumptions are, first, that the total household income is sufficiently high to meet members' basic needs and to overcome liquidity constraints linked to migration; second, that children are cared for in the household.

Similarly, according to van der Berg (2010), the availability of the Child Support Grant changes the decisions regarding where and with whom children reside: mothers from rural areas may be enabled to keep their children with them (instead of leaving them with their grandmothers or other relatives) when they leave for seeking work in urban areas.

The Child Support Grant seems thus to incentivize labor supply. Using data from the General Household Survey of 2002, 2003, 2004 and 2005, from the Labor Force Survey, of 2004 and 2005 and from the National Treasury 2005 and 2007, Williams (2007) shows that the grant has promoted both labor force participation and employment rates in grant-receiving households and that the effects are stronger for women.

Eyal and Woolard (2011) evaluate the impact of the Child Support Grant on women's employment probability and labor market participation. Using a dataset from the October Household Survey and the General Household Survey for the period 1997 to 2008, they suggest that the Child Support Grant increases significantly the recipient's probability of being in the labor force and of being employed. Those effects are particularly relevant if mothers become recipients in their twenties: the employment probability raise by 15 percent and the labor force participation by 9 percent.

On the other hand, as the Child Support Grant is generally received by mothers, it discourages labor supply and confirms the role of women as primary responsible for children cares. Indeed, studies which focus on gender relations, such as the study by Patel and Hochfeld (2011) that uses a household survey conducted in Soweto in 2010, show that the Child Support Grant provides a valuable safety net to poor households, but women remain largely responsible for care and domestic duties and so the women labor supply remains lower than that of men. Thus, the increased reservation wage may reinforce gender gaps (Molyneux 2009; Goldblatt 2005; Patel 2012), and even raising fertility rates in order to become eligible for benefits (Devereux 2011).

6. Conclusions

This study focused on cash transfers, in particular those pursuing development objectives without attaching conditions to the benefits.

As cash transfers since the 2000's have been considered under a holistic approach to development, we focused our attention on two development dimensions: food security and labor supply.

For food security, we referred to the definition given within the 2009 Declaration of the World Summit on Food Security. This definition allows us to consider four dimensions of food security:

food access, food availability, food utilization and stability over time. The effectiveness of cash transfers in addressing food security is debated: questions regard whether these transfers are increasing significantly food consumption levels and whether consumption gains are translated into improved nutritional status and health for the household members.

For labor supply, we noted the long term indirect - and often unintentional - effects of cash transfer programmes. Indeed, there is a huge debate on whether the cash transfers may create dependence from the aid and produce a crowding-out effect on labor market supply or, on the contrary, they support initiatives to generate other sources of income.

Having analyzed the theoretical pathways for cash transfer programmes' impact on food security and labor supply, together with the assumptions which underlie their effectiveness, we focused on the case of South Africa.

South Africa implements unconditional cash transfer programmes which are exceptionally widespread with the aim to pursue long term development objectives as equity promotion and racial integration.

We reviewed the evidence of the effectiveness of the cash transfer programmes implemented in the country: as the two most widespread cash transfer programmes for number of beneficiaries are the Old Age Pension and the Child Support Grant, the available evidence mostly refers on these two programmes.

The first lesson learned from South African cash transfers programmes is that, in analyzing their impact, it is useful to consider how different living arrangements could interfere with the programme effectiveness (Bertrand *et al.* 2003). Indeed, South African social grants produce their effects not only on the targeted beneficiaries, but also on their household members through spillover effects, within household redistribution and intertemporal choices. Moreover, South African households, generally large and multi-generational, are also found to change their composition because of grants receipt.

Thus, for both food security outcomes and labor supply, the impact of cash transfers is better evaluated at a household level rather than on their direct beneficiaries.

With reference to food security, cash transfers in South Africa are found to be effective in allowing households to increase their food access with a degree of stability. The effectiveness of such programmes in supporting households' food consumption expenditure, as suggested by the theoretical background that we analyzed, is mainly given by the regularity, reliability and predictability of transfers for a long period. Indeed, the ultimate goal of these programmes is to support households' consumptions and to protect them from external shocks and chronic poverty.

Nevertheless, the evidence still does not allow clarifying whether households use unconditional cash transfers in the same way of other sources of income or whether cash transfers are considered as an additional income to be spent on valuable basic needs such as food.

This aspect can be relevant when considering whether cash transfers produce a crowding out effect on other kinds of public investments: even if cash transfers are proved to be effective, indeed, it does not mean that these programmes are the first best to address food insecurity and vulnerability. The access to more food is indeed necessary but not sufficient to be food secure.

Thus we consider the “food utilization” dimension of food security: the evidence suggests that beneficiary households suffer less hunger, have a more diversified diet and children more likely register improvements in their anthropometric measures. However, other studies argue that the magnitude of these positive effects is not clear and sometimes it is found to be very small. The design of the programme has clearly a role: the effectiveness of a cash transfer is proved to be highly related to its generosity (as in the case of the Old Age Pension), the duration of the treatment (as in the case of the Child Support Grant, that is more effective when reaches children in their first three years of life) and its stability over time (that allows households to program some investments in agriculture and have some relief in credit constraints to buy some assets, activating a virtuous cycle for local food supply).

To provide generous, stable and predictable transfers is, nevertheless, in trade off with the fiscal sustainability of the system in the long run.

In summary, a more effective approach to improve food security would be to implement a specific and comprehensive food security strategy. Especially in the cases of African and rural households, positive nutritional outcomes should be encouraged by the improvements in ancillary social services, including raising nutritional knowledge and improving access to quality health services (Alderman 2014; Slater *et al.* 2014). Last, income generating programmes and the enhancement of small-scale agricultural activities remain crucial to increase household access to food in the most poverty stricken areas.

With reference to labor supply, the evidence from South Africa highlights the contradictions that already arise from the theoretical background.

On the one hand, cash transfers pool income inside the household, increase reservation wages and thus discourage labor supply. The more discouraged in South Africa are found to be the prime-age workers, particularly women living in three generational households. Indeed, as long as they can count on the support from the elders with a social pension or from grant targeted to their children, and as long as unemployment rates in South Africa remains very high, many African largely depend from social grants.

On the other hand, the transfers have a role in facilitating migration of household members to find work, in sustaining costs of job seeking and in engaging in self-employment activities. Also in this case, the intra-household resources allocation has a fundamental role: when the transfer is generous and stable, it allows workers to migrate leaving childcare responsibilities to the elders. These effects are indeed found to be significant when the recipients are women and particularly on women prime-aged workers.

This contrasting evidence raises some questions.

First, the opportunity to extend the social grants to the entire population by providing a basic income grant. This debate in South Africa dates back to the early 2000s: in 2002, the Taylor Committee of Inquiry into Comprehensive Social Security recommended the introduction of a basic income grant of R100 per month for every South African citizen, irrespective of the age and the income level, as a part of a comprehensive social security system (Makino 2004). The basic income was conceived as a little but universal support in order to not create dependency and rather encouraging job seeking.

Second, the opportunity to directly foresee a safety net for unemployed people, in a country where unemployment remains one of the main barriers for households to get out of poverty. Indeed, cash transfers in South Africa are to date targeted to vulnerable people not economically active (children, elderly, disables) and have an extensive reach, but do not address the structural problem of unemployment.

Income support is however not the only option for public action aimed at supporting vulnerable groups: the provision of services is even more important (Grosh 2008).

Undoubtedly, cash transfers have a role in improving and maintaining households' living standards and may also relax liquidity constraints for job seeking. Moreover, as seen, South African households tend to redistribute the income from the grants within the household, so that protection is provided not just to the cash transfer programmes' target group but to the whole household. Nevertheless, public resources invested in cash transfers - that in South Africa account for 3,3 percent of GDP - are crowd out from investments that could rather address the direct causes of low income levels. As seen, the lack of infrastructure, the remoteness of some rural areas, the dependency from inefficient public transports make difficult and costly to seek for work.

More importantly, liquidity constraints are not the only barrier for labor market participation: low educational levels and poor health services represent the basic failure in providing individuals with capabilities to participate in the labor market and raise an income to get out of poverty.

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Evaluating the Impact of the South African Child Support Grant on Food Expenditure and Dietary Diversity

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Abstract

This paper aims to evaluate the impact of the South African Child Support Grant (CSG) on the food expenditure and on the dietary diversity of the beneficiary households. At this scope, we use the National Income Dynamics Study (NIDS) covering years 2008, 2010-2011 and 2012 and carry out a Regression Discontinuity Design that exploits the variation induced by the expansion in eligibility related to the child age. We find that the CSG is effective in sustaining food expenditure in beneficiary households, and that those effects are more significant among the African headed households, the urban households and the poorest households in monetary terms. Nonetheless, the evaluation also shows that the CSG is not effective in allowing significant changes in the dietary habits of the more disadvantaged sub-populations.

Keywords: Food security, Cash transfers, Regression discontinuity design, Africa.

JEL code: I32, I38, C33, O55.

1. Introduction

After the demise of Apartheid in 1994, South Africa experimented significant political and social advances as well as a rapid economic growth. Social policies and a right based social protection system also led South Africa to steady progresses in reducing income poverty (Leibbrandt and Levinsohn 2011; Leibbrandt *et al.* 2011). Nevertheless, 35 percent of the population in South Africa is estimated to be vulnerable to food insecurity (Kirsten 2012), 20 percent of the households have inadequate or severely inadequate food access, especially in rural areas, and about 25 percent of children under age of six are classified as stunted by malnutrition (Du Toit 2011; Manyamba *et al.* 2012).

The case of South Africa highlights how food insecurity remains a concern even in a middle-income country which is food self-sufficient being able to produce most of the food products and import when necessary.

Food insecurity in South Africa is thus not caused by food unavailability, but it is rather a problem of inadequate access to it. The sub-populations most vulnerable to food insecurity in South Africa are the remote rural populations, the female headed households, the households with few income earners and many dependants, which often rely on social grants to have access to sufficient food (Aliber 2001). Moreover, in South Africa, poverty and vulnerability still have a strong racial footprint.

For this reason, social protection programmes aimed at eradicating extreme poverty play a central role in addressing food insecurity and represent one of the pillars in the Integrated Food Security Strategy established in 1996 (Department of Agriculture 2002).

This paper aims to evaluate the impact on food expenditure as a proxy of economic access to food and on the dietary diversity of the beneficiary households of one of the major social assistance instruments introduced after the end of the apartheid: the Child Support Grant (CSG).

Launched in 1998, the CSG was designed to support children in poverty and those households, particularly in rural areas, who had been excluded from social assistance programmes in the past (Pauw and Mncube 2007). To date, the CSG is the most widespread social grant, reaching about 11 million children in 2014 (SASSA 2014).

From a theoretical point of view, a social grant targeted to children and their households as the CSG may affect food insecurity through a number of channels.

First, it may affect the access to food by addressing the lack of purchasing power of poor households (Alderman 2014). Secondly, it may improve the access to more quality food and allow for a more diversified diet, affecting the food utilization. The expectation of an improvement in food utilization raises also through the consideration that cash transfers targeted to children are mainly received, managed and spent by their mothers or other women in the household. Previous evidence about gender and intra-household resource allocation suggests that women are most likely to use resources

for childcare, food expenditure and other basic needs (Bassett 2008; Hoddinott and Bassett 2008).

However, it is still debated whether these grants are significantly increasing food consumption levels and whether consumption gains are translated into improved nutritional status and health for the household members. In particular, the evidence collected by a number of studies shows that, in the least developed areas, providing cash is not enough to assure an improvement of the nutritional status (Manley *et al.* 2013) and that these programmes rather should be complementary to a better access to quality health services and explicit nutrition objectives (Alderman 2014; Slater *et al.* 2014).

With reference to the CSG, the evidence of its impact on food security is still scant (Manley *et al.* 2013). More in detail, Williams (2007) - using data from the General Household Survey of 2002, 2003, 2004 and 2005, from the Labor Force Survey of 2004 and 2005 and from the National Treasury 2005 and 2007 - finds that children in households that receive the Child Support Grant more probably suffer less hunger. Consistently, Samson *et al.* (2008), using data from a household panel constructed by the EPRI (Economic Policy Research Institute) from repeated cross-sections extracted from the National General Household Surveys from 2002 to 2004, show a reduction in self-reported hunger for CSG recipients. Delany (2008), by implementing an original survey of households in low-income areas in 2007, estimates that beneficiary households allocate a larger proportion of their expenditure to essential goods such as food. Agüero *et al.* (2006) use data from the KwaZulu-Natal Income Dynamic Study (1993, 1998 and 2004) and assess that the CSG has bolstered childhood nutrition as measured by child height-for-age: they find a positive and more significant impact when children receive the grant for at least half of the time during their first three years of life. Last, Coetzee (2013), using data from the first wave of the South African National Income Dynamic Study (NIDS 2008), evaluates the impact of the CSG on children aged under 14 with reference to health, nutrition and education and finds small positive effects on the well-being of the beneficiary children.

This paper aims to provide new evidence of the effectiveness of the CSG in sustaining food access and dietary diversification, by evaluating the impact of the CSG on per adult equivalent food expenditure and on related share of carbohydrates (mainly cereals), proteins (meat, fish and dairy products) and vitamins (fruit and vegetables) in food expenditure.

To this purpose, we use the dataset provided by the National Income Dynamics Study (NIDS) covering years 2008, 2010-2011 and 2012, and we carry out a Regression Discontinuity Design (RDD) that exploits the variation induced by the expansion in eligibility for the CSG related to the child age. Indeed, in 2010 South Africa extended the previous eligibility criteria: children born on or after 1st January 1994 became eligible until their 18th birthday, whereas those born before 1994 lost eligibility at the age of 14. As a result of this policy change, there was a discontinuous increase in the probability of being a CSG beneficiary for households with children between the ages of 14 and 18. This discontinuity provides a natural experiment for examining the causal effects of the programme across birth cohorts.

Our main conclusion is that the CSG is effective in increasing food expenditure in beneficiary households which, in particular, raise the share of carbohydrates and, to a lesser extent, of vitamins in food expenditure. However, the CSG does not contribute to a greater access to proteins.

We further consider that the CSG is specifically intended to reach the most disadvantaged groups, such as the poorest in monetary terms, the African and the rural households. Through an analysis on these sub-populations, we find that the effects related to an increase in food expenditure are more significant for the African headed households, the urban households and those households lying below the poverty lines.

With reference to the dietary diversification, we find that the African headed households, the rural and the income poorest households increase the share of carbohydrates in food expenditure, while, on the contrary, the non-African headed households, the urban and the households lying above the poverty lines increase the share of vitamins in food expenditure. Thus, as cereals are the most consumed food groups among the poorest households, the CSG does not seem to be effective in allowing significant changes in the dietary habits of the beneficiaries households.

The paper is organized as follows: *Section 2* provides an overview of the CSG programme; *Section 3* introduces the dataset, describes the identification strategy and defines the outcome variables of interest to measure food expenditure and dietary diversity; *Section 4* outlines the empirical framework; *Section 5* discusses the results and *Section 6* concludes.

2. The Child Support Grant (CSG)

As Niño-Zarazúa *et al.* (2012) stress, the end of the apartheid in South Africa gave urgency to introduce policies aimed at improving equity and integration. In 1996, the Constitution of the Republic of South Africa stated that “*everyone has the right to have access to social security, including, if they are unable to support themselves and their dependents, appropriate social assistance*”.

Today, the South African social assistance programme, which amounts to 3.5 percent of the GDP, is wider and more effective compared to other African countries (Woolard *et al.* 2010). The core of the programme is the implementation of a number of cash transfer initiatives aimed at reducing the intergenerational transmission of vulnerability and poverty by raising households’ income and encouraging investments in human capital.

Cash transfers in South Africa are typically non-contributory social grants that do not require beneficiaries to meet specific conditionalities. The benefits are provided in the form of monthly income transfer to eligible beneficiaries. Eligibility is typically defined on a means test basis: the condition to qualify beneficiaries is that their income is below specific ceilings, adjusted each year to take account for inflation.

South Africa has seven types of social grants targeted at children, older persons and people with

disabilities (Department Social Development 2010)¹ that, overall, have reached 16.5 million people (more than 25 percent of the population) by March 2015 (SASSA 2015).

In this paper, we only focus on the CSG, which is the most widespread social grant, covering more than 11 million children (SASSA 2014).

The CSG was launched in April 1998 with the intention to support vulnerable children and their households, particularly in rural areas, so to reduce social inequalities and to break the vicious cycle of poverty in the long period.

The underlying idea was that poverty is largely due to deficits in income and that transfers are expected to reduce these deficits (Barrientos *et al.* 2014). Moreover, recognizing that poverty in South African is racially and spatially characterized as a legacy of apartheid, the Lund Committee on Child and Family Support (1996) recommended the CSG as one social assistance instrument through which the benefits enjoyed by the non-Africans (Coloured, Indian/Asian and whites) during the apartheid would be extended to Africans. The Lund Committee also recognized that rural areas were severely affected by the apartheid policies through the systematic dispossession of families of lands and the marginalization of those areas and thus aimed at reversing the urban bias (Case *et al.* 2005).

In 1998, the grant was fixed at a level of R100 per month for each beneficiary child. From 2008 onwards, the amount has been adjusted every year to inflation. Thus, the grant level rose over years reaching R280 per month for each child in 2012 (and R320 in 2014) (Agüero *et al.* 2006; Woolard and Leibbrandt 2010).

At the beginning, the CGS was a conditional cash transfer: applicants were expected to participate in development programmes and give proof of immunization for their children. Anyway these programmes were not implemented in many areas and access to immunization was even harder for the more marginalized children that the grant intended to support. As a consequence, conditionalities were abolished because considered as barriers to receipt for many poor households (Budlender and Woolard 2006; Woolard *et al.* 2010). Since 2010, a soft behavioral condition was re-introduced and it is still in effect: it requires children to be enrolled and to attend school, but different thresholds are applied, recognizing that access to educational, health and employment services is harder in rural areas than in the urban ones. As, so far, in case of non-compliance, the punitive measures (the suspension of transfers) have not been enforced, the Child Support Grant is considered an unconditional cash transfer.

The CSG aims at reaching a great number of families and children on the basis of two eligibility criteria: the income of the recipients and the child age. Considering the income eligibility rule,

¹The social grants are: the Old Age Pension, the Disability Grant, the Child Support Grant, the Care Dependency Grant, the Foster Child Grant, the War Veterans Grant and the Grant-In-Aid.

the caregivers² are selected on the basis of a means test that, during the start up phase of the project, was related to the household income. Since the programme reached only 21,997 children one year after the implementation, the means test was redirected from a household based measure to one which considered the personal income (net of other social assistance grants) of the caregiver (Woolard and Leibbrandt 2010). In 2008, the Department of Social Development defined the income threshold to be equal to ten times the value of the grant for single caregivers (double for married caregivers). Every caregiver can receive the grant for a maximum of six children.

With reference to the child age, when the programme was launched, the age eligibility was limited to children under 7, but later it gradually rose: in 2003 it was extended to children up to their 9th birthday, in 2004 up to their 11th birthday, in 2005 up to the 14th birthday.

From the 1st January 2010, the eligibility was extended to adolescents covering all children born after 1st January 1994: these children became eligible up to their 18th birthday whereas those born before 1994 lost eligibility at 14 (Woolard *et al.* 2010; Van der Berg *et al.* 2010).

As a consequence, in 2010 a big discontinuity in the programme emerged. Comparing data across birth cohorts, this discontinuity in the CSG eligibility provides a sharp natural experiment to look at causal effects of the programme. Children born on 1st January 1994 turned 14 on 1st January 2008, and so the impacts of the policy change on affected cohorts are observable only from this point onwards.

3. The dataset

The NIDS, implemented by the South African Labour and Development Research Unit (SALDRU) at the University of Cape Town, is the first South African nationally representative panel study. The three available waves of the survey cover years 2008, 2010-2011 and 2012.

This dataset is a face-to-face longitudinal survey of individuals resident in South Africa. The aim of the survey was to follow a sample of household members and register changes in households composition and migration and in households' incomes, expenditures, assets, access to social services, education, health, employment and other dimensions of well-being.

The sample design was stratified and two-stage clustered. In the first stage, 400 Primary Sampling Units (PSUs) were randomly selected from the Statistics South Africa (Stats SA) 2003 Master Sample of 3,000 PSU's within each district proportionally to the population. Then, 26,776 individuals during the first wave (2008), 28,551 individuals during the second wave (2010-2011) and 32,633 individuals during the third wave (2012) were successfully interviewed. The result is a panel

²Caregivers are defined by the CSG programme as anyone who takes primary responsibility for meeting the daily care needs of the child, without getting paid for it.

of individuals from more than 7,000 households.³

From the entire NIDS, we obtained our final dataset by applying an identification strategy to identify the causal impact of the CSG and by selecting the variables of interest to evaluate the CSG impact on food access and dietary diversity, as described in the next paragraphs.

3.1. The identification strategy

The expansion in the CSG's age eligibility criteria introduced in 2010 for those children born on or after 1st January 1994 provides a sharp natural experiment for looking at causal effects of the CSG on those households with children in the age range 14-18 who experienced the policy change: children born after 1st January 1994 became eligible up to their 18th birthday whereas those born before 1994 lost eligibility at 14 (Woolard *et al.* 2010; Van der Berg *et al.* 2010).

To exploit this discontinuity, from the NIDS entire dataset, we selected those households with children born from 1990 to 1998. Since our panel data covers the period 2008-2012, cohorts prior to 1990 were excluded because never eligible for the grant in the period 2008-2012 as in 2008 they already turned 18, and cohorts born after 1998 were excluded because eligible for their entire childhood and, in 2008, still have not turned 14.⁴

We then proceeded in our identification strategy by restricting the sample to households with only one child receiving the CSG: in the households with more than one child, we could find a child who is born before and a child who is born after 1st January 1994, so we would not be able to identify the sharp discontinuity due to the increase of the eligibility age. In the non-beneficiary households, we also selected only one child per household, the one belonging to the birth cohort closest to the cohort of January 1994, in order to avoid repeated information at household level.

Last, few households with children who were not eligible on the basis of the age rule (cohorts born between 1990 and 1994) declared to receive the grant: we excluded these cases as inclusion errors. We also took into account that the NIDS survey is designed to follow the individuals and not the households. Thus, we extracted a sample in which the household composition remains unchanged during the three survey periods. In this way, we ensured the absence of migration within different provinces and to the urban areas.

The aforementioned strategy allowed us to obtain a sub-sample of 1,234 households with one child born between 1990 and 1998 for a total sample of 3,702 observations across the three waves.

³Household members are defined as persons who have lived under the “roof” or within the same compound/homestead at least 15 days during the last 12 months or arrived in the last 15 days and the “roof” was not their usual residence. Moreover, the person should share food from a common “pot” and share resources from a common resource pool.

⁴We thus obtained a sample of children in the range from 10 (in 2008) to 22 (in 2012) years old.

Table 2 reports the characteristics of the households of our sample, distinguishing by treatment group (households with a child born after January 1994) and control group (households with a child born before January 1994). We considered two periods: from 2008 to 2012 and from 2008 to 2011 because some of the selected outcome variables (see next paragraph) are not provided by the third wave (2012) of the NIDS dataset.

To give a picture of the main characteristics of the chosen sub-sample of households and to provide corroborative evidence by showing that the observable characteristics of households are balanced on both sides of the discontinuity, we consider: the household dimension (number of household members); the geographical location in urban or rural areas; the income poverty levels; the head of household's race, gender and educational level.

Reported statistics in *Table 2* show that the treatment and the control group are similar as per observed characteristics. A remarkable difference between the two groups is relative to the number of household members: in the treatment group, households are more likely composed by more components than the households in the control group.

With reference to the income poverty levels, we considered the Statistics South Africa (Stats SA) money metric measures of poverty in the country (Stats SA 2007 a,b), which follow a “cost of basic needs” approach as reported by Ravallion (1998). This approach determines a consumption bundle considered adequate for basic consumption needs and its cost estimation. In the post-apartheid South Africa, vulnerability and poverty changed rapidly with circumstances and households movements in and out of poverty were observed around an absolute poverty line. As a consequence, a food poverty line and an upper-bound and a lower-bound poverty lines were identified. In brief, the South African poverty lines are:

- food poverty line (FPL), that is the level of consumption below which individuals are unable to purchase sufficient food to provide themselves with an adequate diet;
- lower-bound poverty line (LBPL), that includes the consumption of other basic non-food items but requires that individuals sacrifice food in order to obtain these;
- upper-bound poverty line (UBPL), that is the level of consumption that allows people to purchase both adequate food and non-food items.

The FPL is calculated as the cost of satisfying the daily energy requirement for the average person over one month, that the South African Medical Research Council calculates as 2,261 calories per person (Stats SA 2007 b). The food basket is composed by food items commonly consumed by all expenditure-ranked household groups and usually recommended for a balanced diet. The median quantities of the reference food basket, as purchased by reference household, were then derived from the household-level food expenditure using the Consumer Price Index (CPI) for food at September 2000. The LBPL and the UBPL include non-food expenditures as accommodation, electricity, clothing, schooling for children, transport and medical services among other things.

The three poverty lines are measured in per capita terms, assuming that resources are equally

shared in the household without differences based on age, gender or spousal status. These poverty lines are expressed in per month Rands and are annually adjusted using CPI data that track the rate of change in the price of goods and services purchased by consumers (see *Table 1* for poverty lines' values).

Table 1: *Poverty lines*

Year	Food poverty line	Lower-bound poverty line	Upper-bound poverty line
2008	259	360	507
2010	307	424	594
2011	321	443	620
2012	339	468	655

Source: Stats SA (2014).

Table 2 shows that more than 60 percent of the sample lies below the poverty lines and, in particular, a third of the households lies under the food poverty line. The treatment and the control group does not show any significant difference with reference to the poverty levels in monetary terms.

3.2. Examining food access and dietary diversity: the outcome variables

To evaluate the causal effect of the CSG on food access and dietary diversity, we considered the food expenditure as a proxy of economic access to a sufficient quantity of food and we analyzed the expenditure disaggregated by food groups as a proxy of the dietary diversity for the beneficiary households.

The NIDS dataset provides information about the expenditure at the household level. In particular, the expenditure variable of interest is the total monthly food expenditure with full imputation, which is the result of the aggregation of four separate sources of food: *i*) expenditure for food items; *ii*) value of food items received as gift; *iii*) value of food items received as payment; *iv*) value of food items own-produced.

In order to express the expenditure at constant prices, we adjusted it for the monthly and provincial CPI (December 2012 = 100) and then we considered the per adult equivalent measure to deal with economies of scale for expenditure at the household level. We applied the formula commonly used for poverty and welfare analysis in South Africa (May *et al.* 1995; Woolard and Klasen 2005), to obtain food expenses per adult equivalent at constant prices. The formula is:

$$Adult\ Equivalent\ Scale = \frac{Household\ Income}{(Adult + 0.5 * Children)^{0.9}}$$

The food items considered in the survey are 32. To evaluate the dietary diversification, we considered three main food groups and expressed the expenditure for these food aggregates as a share in the per adult equivalent food expenditure. The food groups are: *i*) the carbohydrates, given by

Table 2: *Households' socio-economic characteristics*

	Period 2008-2012				Period 2008-2011			
	Sample	Treatment	Control	Diff.	Sample	Treatment	Control	Diff.
Number of household members								
One or two	0.140	0.106	0.189	-0.083	0.130	0.098	0.177	-0.079
Three	0.235	0.241	0.226	0.015	0.247	0.258	0.232	0.026
Four	0.219	0.230	0.204	0.026	0.227	0.238	0.212	0.026
Five	0.181	0.187	0.171	0.016	0.183	0.185	0.179	0.006
Six or more	0.224	0.234	0.208	0.016	0.212	0.219	0.200	0.019
Geographical location								
Urban	0.558	0.543	0.582	-0.039	0.055	0.536	0.572	-0.036
Rural	0.442	0.457	0.418	0.039	0.449	0.464	0.428	0.036
Income poverty levels								
Food poverty line	0.362	0.352	0.376	0.024	0.293	0.291	0.267	0.024
Lower-bound poverty line	0.176	0.184	0.165	0.019	0.171	0.178	0.159	0.019
Upper-bound poverty line	0.153	0.157	0.148	0.009	0.167	0.171	0.162	0.009
Above poverty lines	0.308	0.307	0.310	0.003	0.368	0.359	0.381	-0.022
Head of household by race								
African	0.767	0.775	0.757	0.018	0.767	0.775	0.757	0.018
Colored	0.171	0.161	0.185	0.024	0.171	0.161	0.185	-0.024
Asian/Indian	0.020	0.022	0.018	0.004	0.020	0.022	0.018	0.004
White	0.041	0.042	0.039	0.003	0.041	0.042	0.040	0.002
Head of household by gender								
Male	0.386	0.375	0.404	-0.029	0.419	0.415	0.425	-0.010
Female	0.613	0.625	0.596	0.029	0.581	0.585	0.575	0.010
Head of household by education								
No schooling	0.181	0.192	0.165	0.027	0.200	0.214	0.179	0.035
Primary	0.267	0.287	0.239	0.048	0.280	0.293	0.261	0.032
Secondary	0.513	0.487	0.552	-0.065	0.487	0.462	0.524	-0.062
Higher degree	0.037	0.033	0.044	-0.011	0.033	0.031	0.035	-0.004

Notes: i) Descriptive statistics of district of residence, year and month of the interview are omitted.

the sum of the expenditures on cereals and porridges, samp, flour and bread, mealie meals, rice and pasta; *ii*) the proteins, given by the sum of the expenditures on meat (red meat, also canned, and chicken), fish (fresh or tinned), eggs, milk and cheese; *iii*) the vitamins, given by the expenditure for fruits (also tinned) and nuts, potatoes and other vegetables. Other minor food items - as, for example, oils and fats, sweets, beverages - are not included in these three aggregates.

During the third wave (2012), information about the expenditure by food items was collected only for those households that registered a share of food expenditure in the total expenditure higher than 80 percent or lower than 5 percent. For this reason, for what concerns the analysis on dietary diversity we must limit our evaluation to the period 2008-2011.

Table 3 reports the mean and standard deviation (s.d.) for the per adult equivalent food expenditure for the period 2008-2012 for the entire sample and for the sub-populations with respect to income poverty levels, head of the household's race and household geographical location.

It also reports the dietary composition among carbohydrates, proteins and vitamins for the full sample and the considered sub-populations, for the period 2008-2011.

Table 3: *Households' food expenses and dietary differences*

	Period 2008-2012		Period 2008-2011					
	Food expenditure		Carbohydrates		Proteins		Vitamins	
	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.
Full sample	500.460	497.196	19.329	18.375	20.141	18.666	5.857	6.386
Income poverty levels								
Food poverty line	195.772	71.235	20.300	21.156	15.578	17.665	5.229	6.816
Lower-bound poverty line	359.050	51.188	20.938	18.370	19.513	17.929	5.643	6.199
Upper-bound poverty line	485.294	67.906	20.664	16.737	22.219	17.878	6.236	5.384
Above poverty lines	1,025.971	686.224	16.123	14.360	25.663	19.309	6.648	6.344
Head of household by race								
African	424.493	437.347	21.477	19.131	19.441	17.888	5.774	6.305
Colored	624.009	445.011	12.404	13.642	22.199	20.704	5.961	6.423
Asian/Indian	958.409	640.730	11.746	12.047	20.859	19.333	5.941	6.091
White	1,313.572	794.425	9.492	9.523	25.221	22.912	7.109	7.869
Geographical location								
Urban	584.260	596.206	15.543	15.254	22.026	20.179	5.922	6.493
Rural	397.443	308.227	23.992	20.680	17.826	16.329	5.778	6.254

We can see that the mean of food expenses is of about R500, but with gaps among sub-populations: those households lying below the food poverty lines spend about R196 for food, those lying below the upper bound poverty line spend R485, while the non-poor spend more than R1,000. Similarly, the Africans spend for food less than half of whites (R424 against R1,313).

The urban households register a per adult equivalent food expenditure of R584 against the R397 of the rural households. In this case, we have to consider that, even if data include the value of

food items own produced for self-consumption, in the case of rural households, where the own-production for self consumption is higher than in urban areas, more probably data are misreported or underestimated.

Looking at the dietary composition (for the period 2008-2011), we can see that the share of carbohydrates in food expenditure is higher for the more disadvantaged groups: those lying below the poverty lines, the African headed households and the rural households.

On the contrary, the share of proteins in food expenditure is higher for the less disadvantaged groups: the non-poor households, the white headed households and the urban households.

The differences between the sub-populations with reference to the share of vitamins in food expenditure is less evident, but still, the expenses for vitamins are higher for the non-poor households and the white headed households.

These first descriptive statistics of the outcome variables highlight how the poor diet variety is a problem concerning the income poorest households and those households that were disadvantaged as a legacy of apartheid: the Africans and the rural households. These latter - as stressed by Labadarios *et al.* (2011) and by the South African Department of Health (2013) - have a diet poor in variety and consume more cereals and fewer items in other food groups than the less disadvantaged groups.

4. The empirical framework

A regression discontinuity design (RDD) allows to estimate the treatment effects of a programme in a non-experimental setting. When the agents do not have a complete control over the assignment variable⁵, it is “as good as randomized” in the neighborhood of the discontinuity cutoff (*Local Random Assignment*) (Lee 2008; Lee and Lemieux 2010).

In the case of the CSG, the access to more years of cash transfers (for children born on or after 1st January 1994, from the 14th up to the 18th birthday) is only determined by the age eligibility and, hence, does not represent an issue for internal validity. Indeed, individuals are not able to manipulate their date of birth and thus have approximately the same probability of having an assignment variable that is just above (receiving the treatment) or below (being denied the treatment) the cutoff of January 1994.

The Local Random Assignment implies that the discontinuity gap at the cutoff identifies the treatment effect of interest (τ) or that:

⁵Formally, this hypothesis ensures that the stochastic error component in the assignment variable is continuously distributed.

$$\lim_{\epsilon \downarrow 0} Pr(Y|X = c + \epsilon) - \lim_{\epsilon \uparrow 0} Pr(Y|X = c + \epsilon) = \tau \quad (1)$$

where X is the assignment variable (the birth cohort of children) which is deterministically related to the cutoff point c (January 1994), Y is the outcome variable of interest (i.e. the per adult equivalent food expenditure) and ϵ determines the neighbor in which the Local Random Assignment is satisfied.

Since the participation in the CSG programme is not compulsory, some households with eligible children do not apply for the grant. This means that the assignment variable X influences but does not completely determine the treatment variable $D \in \{0, 1\}$ (the jump at c is smaller than 1) and a fuzzy RDD is required. In this case, only the individuals who were assigned to the treatment and who actually participated in the treatment may expect a treatment variation after crossing the age of birth cutoff.

The conditional probability $Pr(D = 1|X = c)$ is thus known to be discontinuous at c (Hahn *et al.* 2001), that is:

$$\lim_{\epsilon \downarrow 0} Pr(D = 1|X = c + \epsilon) \neq \lim_{\epsilon \uparrow 0} Pr(D = 1|X = c + \epsilon) \quad (2)$$

Therefore, in the case of fuzzy RDD, the treatment effect is obtained by dividing the jump in the relationship between Y and X at c (equation 1) by the difference at the cutoff of the probability for the compliers of being treated (equation 2). The treatment effect in the fuzzy RDD (defined as τ_F) thus is:

$$\tau_F = \frac{\lim_{\epsilon \downarrow 0} E(Y|X = c + \epsilon) - \lim_{\epsilon \uparrow 0} E(Y|X = c + \epsilon)}{\lim_{\epsilon \downarrow 0} E(D|X = c + \epsilon) - \lim_{\epsilon \uparrow 0} E(D|X = c + \epsilon)} \quad (3)$$

where the denominator is different from zero because of the known discontinuity of $E(D|X)$ at c .

If there is a Local Random Assignment, equation 3 provides an unbiased estimate of a weighted version of the Local Average Treatment Effect (LATE), where the impact of the programme is evaluated on “compliers”: individuals assigned to the treatment and who actually participated in the treatment, compared to those who were assigned to the control group and did not participate in the treatment (Jacob *et al.* 2012).

Interestingly, equation 3 shows a close analogy between the fuzzy RDD and the Wald formulation of the treatment effect in an instrumental variable setting (IV). The IV formulation requires the monotonicity and the excludability related to the assignment variable when it crosses the cutoff point (Hahn *et al.* 2001).⁶ When these assumptions hold, the treatment effect in the fuzzy RDD can be written as:

⁶Under the “monotonicity” assumption, X crossing the cutoff point c cannot simultaneously cause some units to

$$\tau_F = E[Y(1) - Y(0)|household is a complier, X = c] \quad (4)$$

where $Y(1)$ and $Y(0)$ respectively represent the realization of the outcome variable after and before the cutoff point c and the “compliers” are units who can get the treatment if the cutoff is at X or higher, but they cannot get the treatment if the cutoff is below X (Lee and Lemieux 2010).

This structure is useful to set-up an estimation strategy built on the comparison of a local polynomial estimator (LP) with a parametric estimator through IV. The local polynomial estimator approximates the regression functions above and below the cutoff by means of weighted polynomial regressions, with weights computed by applying a kernel function to the distance of each observation’s score to the cutoff. For the choice of the most appropriate bandwidth, we follow Calonico *et al.* (2014).

The application of the LP provides an immediate graphical representation of the relation of interest, without introducing any relevant households’ characteristic. More in detail, it gives a graphical representation of the link between the assignment variable X and the treatment dummy D described in equation 5 and between the assignment variable X and the outcome variables Y described in equation 6 in the neighbor of the cutoff. Further, it provides an inspection of the functional form in the RDD, useful to set-up a robustness analysis in the parametric setting (Jacob *et al.* 2012).⁷

To estimate equation 4 in an IV framework, given that the monotonicity assumption holds (Hahn *et al.* 2001), we imposed a linear form on the two-sided relationship among the assignment variable, the treatment dummy and the outcome variable.

The first stage and reduced form regression equations are:

$$D_i = \alpha_0 + \alpha_1 X_i + W_i' \alpha_2 + \alpha_3 trend + \alpha_4 trend^2 + \sum_{k=1}^K \gamma_k P_k + \sum_{k=1}^K \gamma_k^2 (P_k \times trend) + \sum_{k=1}^K \gamma_k^3 (P_k \times trend^2) + \Psi \quad (5)$$

$$Y_i = \beta_0 + \beta_1 D_i + W_i' \beta_2 + \beta_3 trend + \beta_4 trend^2 + \sum_{k=1}^K \theta_k P_k + \sum_{k=1}^K \theta_k^2 (P_k \times trend) + \sum_{k=1}^K \theta_k^3 (P_k \times trend^2) + \Phi \quad (6)$$

where W is a matrix of households’ relevant characteristics such as the number of household components, the geographic location, the poverty levels in monetary terms as well as relevant charac-

take up and others to reject the treatment.

Under the “excludability” assumption, X crossing the cutoff c cannot affect Y except through impacting receipt of treatment (Hahn *et al.* 2001).

⁷In line with Jacob *et al.* (2012), we will not provide estimation results of the equation 4 using the local polynomial estimator, since the sample of households is too small and the estimates may be biased. As a consequence, only parametric estimates are presented.

teristics of the head of the household such as his/her race, gender and educational level.⁸ To take into account non-linear patterns of food expenditure, following Pieroni *et al.* (2013) and Pieroni and Salmasi (2015), we also included a second order polynomial time trend ($trend$ and $trend^2$) and their interactions with district dummies P_k . Ψ and Φ are error terms.

Y_i describes, one by one, the *i*) per adult equivalent food expenditure for the period 2008-2012 and, for the period 2008-2011, *ii*) the share of carbohydrates in food expenditure, *iii*) the share of proteins in food expenditure, *iv*) the share of vitamins in food expenditure.

The corresponding structural equation can be obtained as:

$$Y_i = \rho_0 + \rho_1 D_i + W_i' \rho_2 + \rho_3 trend + \rho_4 trend^2 + \sum_{k=1}^K \lambda_k P_k + \sum_{k=1}^K \lambda_k^2 (P_k \times trend) + \sum_{k=1}^K \lambda_k^3 (P_k \times trend^2) + \Omega \quad (7)$$

where the instrumental variable estimate of the coefficient ρ_1 is obtained by the ratio of the reduced form coefficient of the assignment variable in equation 6 and 5, that is $\rho_1 = \beta_1 / \alpha_1$.

Finally, as stressed by Jacob *et al.* (2012), more sophisticated functional forms may be used as robustness checks of the linear formulation. Thus, in model (2), we included non-linearities in equation 5, 6 and 7 by introducing a second-degree polynomial of the assignment variable and we compared the estimated parameters in model (1) and (2) (Van der Klaauw 2002).

In a second stage of our analysis, because of our interest in evaluating the CSG causal effect on those groups specifically targeted by the programme, we applied the same methodology described above on sub-populations and in particular: *i*) on African vs non-African headed households; *ii*) on urban vs rural households; *iii*) on households lying below the poverty lines vs households above the poverty lines. The aim was to check whether the CSG produces differential effects between these groups and to compare results.

5. Results and robustness analysis

Before presenting the main results of our analysis, we give some insights into the internal validity of the Regression Discontinuity Design. Since the CSG beneficiaries do not have a complete control over the assignment variable, i.e. the birth cohort, the Local Random Assignment assumption is not an issue in the present analysis and equation 2 always identifies the treatment effect of interest.

Figure 1 and *2* give a graphical representation of the link between the assignment variable X (the birth cohort of children) and the treatment dummy D (the probability of participating in the CSG programme) described in equation 5 (panels *a*) and display the density function of the assignment

⁸See *Table 2* for descriptive statistics.

variable by monthly cohorts of birth (panels *b*) for the periods 2008 to 2012 and 2008 to 2011, respectively.

Figure 1(a) and 2(a) show that the fuzzy structure of the RDD is correctly identified, since the probability of participating in the CSG programme is zero for children born before January 1994 (the left side of the cutoff), whereas it changes by less than one as the assignment variable crosses the cutoff value (the right side of the cutoff). For children exposed to the CSG programme change during the time span from 2008 to 2012 and during the time span from 2008 to 2011, the probability to participate in the programme ranges between 10 and 70 percent.

Fig. 1.— *Internal validity of the fuzzy regression discontinuity design - period 2008-2012*

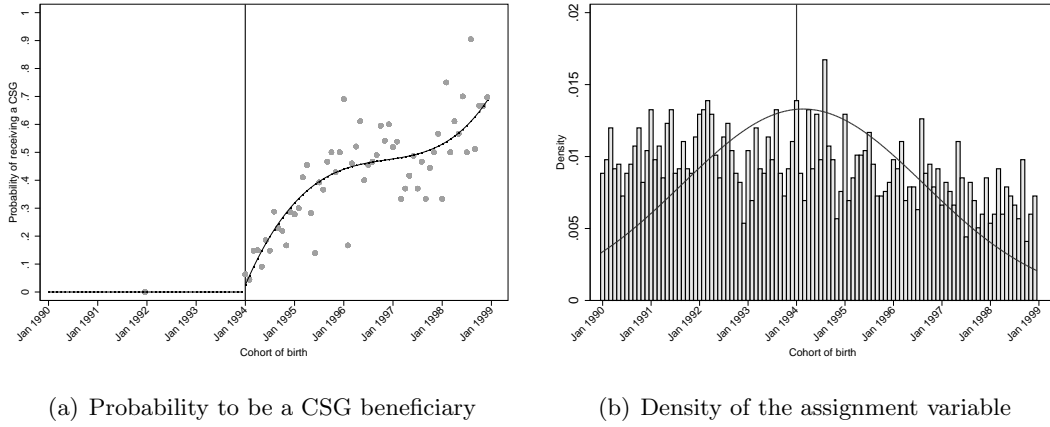
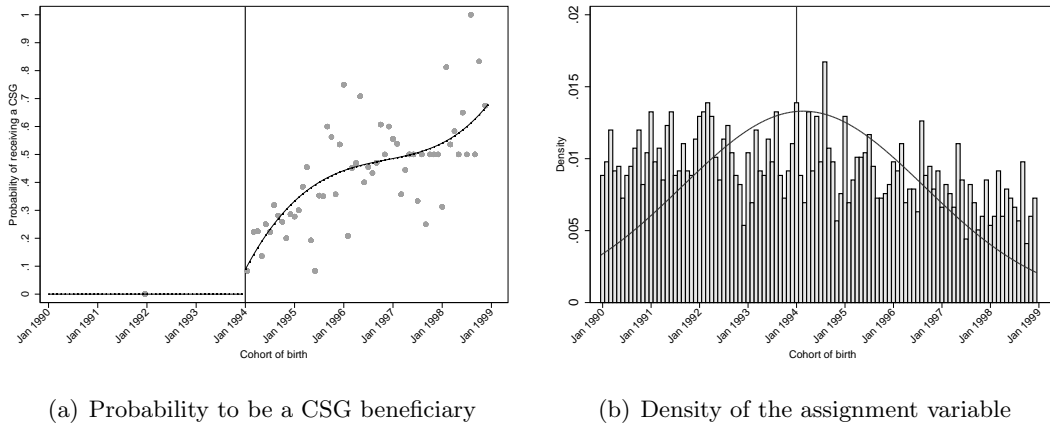


Fig. 2.— *Internal validity of the fuzzy regression discontinuity design - period 2008-2011*



Further, in Figure 1(b) and 2(b), we also inspected a graph of the density of the assignment variable, showing that there are no discontinuities in the number of observations just above or below the cutoff and that the distribution of the assignment variable is homogeneous in the neighbor of the cutoff (Jacob *et al.* 2012). By presenting together these two graphs, we show, first, that there is a

discontinuity in the probability to receive a CSG given the birth cohorts and, secondly, that this discontinuity is not depending on the distribution of children across different cohorts.

Following the methodological outline described in the previous section, we present the outcomes of the local polynomial estimator (Calonico *et al.* 2014).

Figure 6 presents such estimates when we took into account the access to food expenditure (through the per adult equivalent food expenditure) and the dietary diversity (through the share of carbohydrates, proteins and vitamins in food expenditure).

From *Figure 6(a)*, we find a clear discontinuity in the per adult equivalent food expenditure after January 1994. In the neighbor of the cutoff point, we see a jump of about R50 in per adult equivalent food expenditure. A clear discontinuity is also found in *Figure 6(b)* when the share of carbohydrates is accounted. In this case, we found approximately a variation of 2.5 percentage points in carbohydrates expenses. We did not find any evidence of the presence of a discontinuity when the shares of proteins is accounted (*Figure 6(c)*) and any evident outcomes when the share of vitamins is accounted (*Figure 6(d)*).

As stressed by Jacob *et al.* (2012), if the sample is small as it is in our case, the local polynomial estimator may be biased. Thus, we proceed in our analysis by presenting parametric estimates from an instrumental variable framework.

We present estimates from two models: the first one (1) considers a linear functional form, while the second one (2) introduces a non-linear functional form of the assignment variable. For each model, we test whether the instruments are weak: thus, for model (1) we report the first-stage F statistic, while for model (2) - where there are more instruments - we report the Cragg and Donald (1993) statistic.

Table 4 reports the estimation of the impact of having a CSG beneficiary on the per adult equivalent food expenditure relative to the period 2008-2012: it shows that food expenditure is higher of about R56 for CSG recipient households, coherently with what we had already found through the graphical analysis. Comparing results from models (1) and (2), we can also see that the linear specification of the assignment variable provides stable and reliable estimates.

Table 5 considers the composition of the food expenditure by analyzing as outcome variables the share of carbohydrates, proteins and vitamins in per adult equivalent food expenditure. Estimates are relative to the period 2008-2011. The impact of the CSG receipt on the household food expenditure composition is reflected in an increase of the share of carbohydrates by 2.5 percentage points (in both models) and in an increase of the share of vitamins - poorly significant - by 0.9 percentage points. On the contrary, no significant effect is found when the share of proteins in food expenditure is examined.

Fig. 3.— *Graphical evidence: discontinuities around the cutoff*

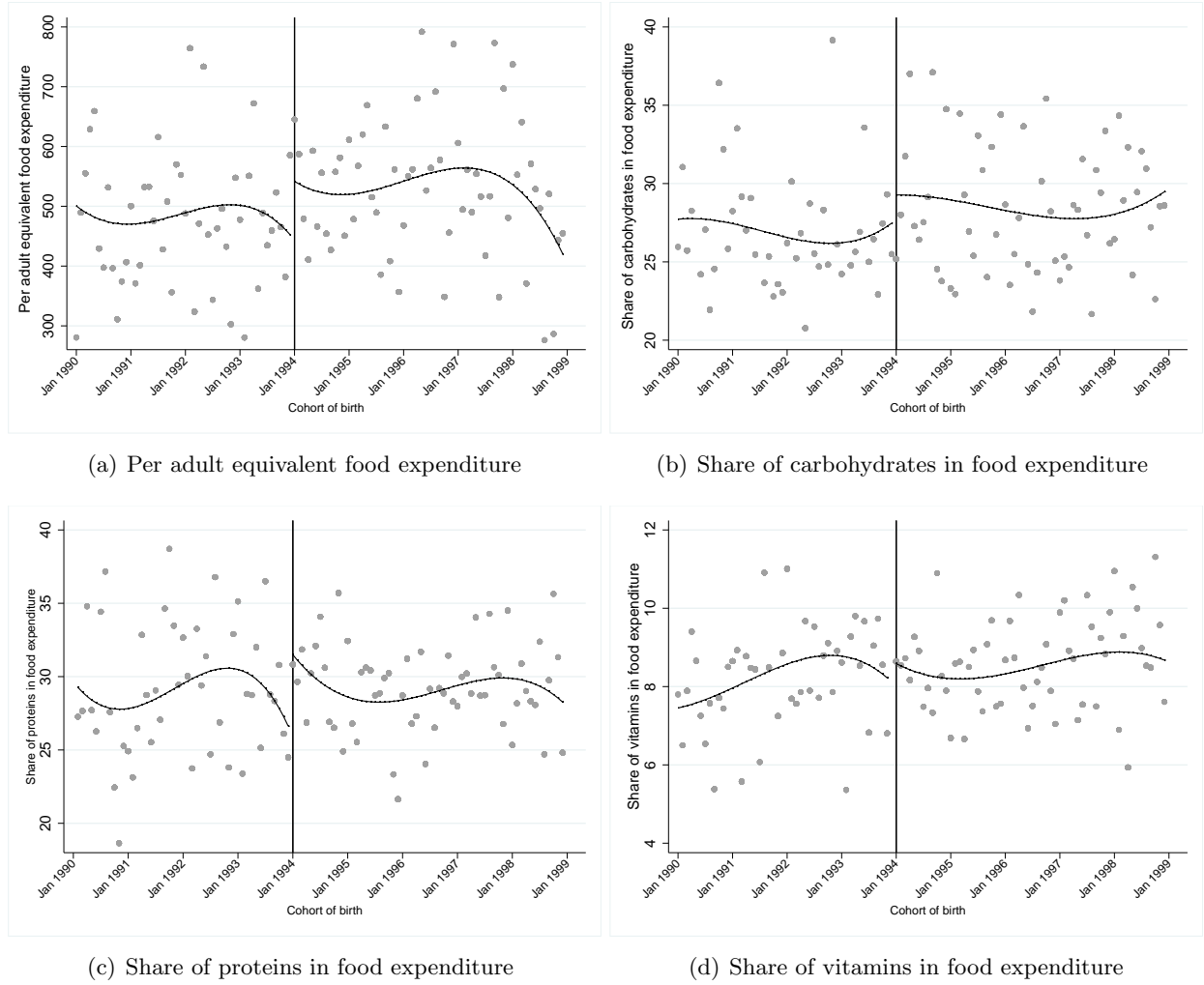


Table 4: *Impact of the CSG on per adult equivalent food expenditure*

	Period 2008-2012	
	Per adult equivalent food expenditure	
	(1)	(2)
Child Support Grant	56.584 ** (24.316)	50.818 ** (23.680)
Constant term	-62.824 (174.760)	-61.306 (174.495)
Fixed effects	Yes	Yes
Linear and quadratic trend	Yes	Yes
Selected covariates	Yes	Yes
R^2	0.523	0.524
No. of observations	3,409	3,409
First stage: weak instrument test	1,293.37 (0.000)	687.416 (0.000)

Notes: See the list of selected covariates in *Table 2*. Robust standard errors are in brackets. P-value levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Model (1) has a linear specification, while model (2) has a non-linear specification. Tests for weak instrument: for model (1) the first-stage F statistic is reported, while for model (2) the Cragg and Donald (1993) statistic for more instruments is reported.

Table 5: *Impact of the CSG on the share of carbohydrates, proteins and vitamins in food expenditure*

	Period 2008-2011					
	Carbohydrates			Proteins		Vitamins
	(1)	(2)		(1)	(2)	(1) (2)
Child Support Grant	2.760 (1.278)	** (1.252)	**	0.430 (1.339)	0.289 (1.304)	0.981 (0.586) *
Constant term	26.813 (7.264)	*** (7.267)	***	37.570 (10.647)	37.642 (10.654)	15.607 (5.292) ***
Fixed effects	Yes	Yes		Yes	Yes	Yes
Linear and quadratic trend	Yes	Yes		Yes	Yes	Yes
Selected covariates	Yes	Yes		Yes	Yes	Yes
R^2	0.377	0.377		0.262	0.262	0.121
No. of observations	2,196	2,196		2,199	2,199	2,199
First stage: weak instrument test	857.479 (0.000)	453.056 (0.000)		860.571 (0.000)	455.703 (0.000)	860.571 (0.000) 455.703 (0.000)

Notes: See the list of selected covariates in Table 2. Robust standard errors are in brackets. P-value levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Model (1) has a linear specification, while model (2) has a non-linear specification. Tests for weak instrument: for model (1) the first-stage F statistic is reported, while for model (2) the Cragg and Donald (1993) statistic for more instruments is reported.

Similar conclusions are reached by d’Agostino, Scarlato and Napolitano (2016) which carried out a regression discontinuity design on the same dataset and analyzed the internal and external⁹ validities of the results by comparing results from parametric, semi-parametric and non-parametric estimations. Robust positive results related to the CSG effectiveness were found with reference to the total food expenditure in the beneficiaries’ households and to the share of carbohydrates in food expenditure.

5.1. An analysis on sub-populations

We proceeded in our analysis by evaluating whether the CSG produces differential impacts on sub-populations. To this aim, we focused on those sub-populations on which the policy makers intended to act. Thus, as the CSG aims at reaching the poorest households, particularly in rural areas, who have been excluded from social assistance programmes in the past (Pauw and Mncube 2007), we distinguished between: *i*) African and non-African headed households, *ii*) urban and rural households and *iii*) households lying below the poverty lines and households above the poverty lines (as defined in *Section 3.1*).

From parametric estimates through IV showed in *Table 6*, we can see that the CSG is effective in supporting the food expenditure of African headed households, while it is not for non-Africans: African headed households increase their food expenditure of about R56, that is the same result we found on the whole sample. As a matter of fact, CSG beneficiaries are mainly Africans.

Table 6 also shows that the CSG is effective on urban households, probably because many rural areas are remote and food availability is a serious concern (Grobler *et al.* 2015). However, we should note that, even if the food expenditure variable is comprehensive of the value of food items own produced for self-consumption, in survey data it is often misreported or underestimated. As a consequence, for rural areas - where the own-production for self-consumption is higher than in urban ones - part of the effect of the CSG on food consumption can be missing.

Last, estimates are found to be significant - even if poorly - for those households that lie below the poverty lines, while for those above the poverty lines estimates are not significant.

We thus focused on the dietary diversity for the considered sub-populations. In *Table 7*, we present results for the effect of the CSG on the share of carbohydrates and on the share of vitamins in food expenditure, while we do not report results for the share of proteins in food expenditure as it was not significant neither for the whole sample nor for any of the sub-populations.

From parametric estimates through IV showed in *Table 7*, we can see that the effect of the CSG for the more disadvantaged sub-populations is significant only with reference to the share of car-

⁹The external validity assumption refers to the constancy of the local average treatment effect (LATE) for the birth cohorts away from the cutoff point.

Table 6: *Impact of the CSG on per adult equivalent food expenditure by sub-populations*

Period 2008-2012						
Per adult equivalent food expenditure						
	African		non-African			
	(1)	(2)	(1)	(2)		
Child Support Grant	56.371 ***	52.084 **	78.437	58.941		
	(20.837)	(20.242)	(107.054)	(105.875)		
Constant term	142.122 **	143.392 **	-125.132	-119.881		
	(57.301)	(57.135)	(261.139)	(260.359)		
Fixed effects	Yes	Yes	Yes	Yes		
Linear and quadratic trend	Yes	Yes	Yes	Yes		
Selected covariates	Yes	Yes	Yes	Yes		
R^2	0.447	0.447	0.587	0.589		
No. of observations	2,629	2,629	780	780		
First stage: weak instrument test	1,269.88 (0.000)	668.428 (0.000)	122.423 (0.000)	35.083 (0.000)		
	Rural		Urban			
	(1)	(2)	(1)	(2)		
Child Support Grant	-15.667	-17.389	140.246 ***	129.155 ***		
	(15.916)	(16.276)	(51.275)	(48.566)		
Constant term	-101.736	-101.563	67.106	71.650		
	(183.891)	(183.851)	(268.938)	(268.212)		
Fixed effects	Yes	Yes	Yes	Yes		
Linear and quadratic trend	Yes	Yes	Yes	Yes		
Selected covariates	Yes	Yes	Yes	Yes		
R^2	0.750	0.750	0.481	0.482		
No. of observations	1,501	1,501	1,908	1,908		
First stage: weak instrument test	452.021 (0.000)	223.707 (0.000)	903.647 (0.000)	577.274 (0.000)		
	Below poverty lines		Above poverty lines			
	(1)	(2)	(1)	(2)		
Child Support Grant	18.619 *	16.681	244.861	210.392		
	(10.642)	(10.294)	(161.974)	(162.216)		
Constant term	354.493 ***	354.472 ***	255.964	274.156		
	(77.020)	(76.974)	(432.907)	(431.075)		
Fixed effects	Yes	Yes	Yes	Yes		
Linear and quadratic trend	Yes	Yes	Yes	Yes		
Selected covariates	Yes	Yes	Yes	Yes		
R^2	0.139	0.140	0.199	0.204		
No. of observations	2,471	2,471	938	938		
First stage: weak instrument test	1,315.98 (0.000)	683.842 (0.000)	97.359 (0.000)	51.574 (0.000)		

Notes: See the list of selected covariates in Table 2. Robust standard errors are in brackets. P-value levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Model (1) has a linear specification, while model (2) has a non-linear specification. Tests for weak instrument: for model (1) the first-stage F statistic is reported, while for model (2) the Cragg and Donald (1993) statistic for more instruments is reported.

bohydrates in food expenditure, with an increase of 3.9 percentage points for the African headed households, of 2.8 percentage points (but poorly significant and not very robust) for the rural households and of 2.7 percentage points for the households lying below the poverty lines.

On the contrary, the non-African headed households, the urban households and the non-poor households increase the share of vitamins in food expenditure, with an increase of about 4.6 percentage points for the non-Africans headed households, of about 2 percentage points for the urban households and of about 5 percentage points for the households lying above the poverty lines.

Overall, these results suggest that the size of the grant is not sufficiently high to allow a significant change in the dietary habits of the income poorest beneficiaries and the more disadvantaged groups as well as to guarantee a nutritionally adequate food basket.

d'Agostino, Scarlato and Napolitano (2016)¹⁰ performed a study producing additional robustness analysis through the estimation of elasticity measures based on a two-step propensity score procedure. Focusing on the share of carbohydrates in food expenditure, they found that a 1 percent variation in participation in the CSG programme produces an increase in the expenditure for carbohydrates especially for those households living under the food poverty line and for the African headed households.

¹⁰See *Section 5*.

Table 7: Impact of the CSG on share of carbohydrates and vitamins in food expenditure by sub-populations

	Period 2008-2011					
	Carbohydrates			Vitamins		
	African		non-African	African		non-African
	(1)	(2)	(1)	(1)	(2)	(1)
Child Support Grant						
Constant term	3.918 (1.355) ***	3.734 (1.340) ***	-3.173 (3.685) ***	0.440 (0.609) ***	0.416 (0.618) ***	4.604 (1.902) ***
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Linear and quadratic trend	Yes	Yes	Yes	Yes	Yes	Yes
Selected covariates	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.319	0.319	0.314	0.131	0.131	0.169
No. of observations	1,699	1,699	497	1,702	1,702	497
First stage: weak instrument test	850.861 (0.000)	448.75 (0.000)	80.732 (0.000)	857.507 (0.000)	452.238 (0.000)	80.732 (0.000)
	Rural		Urban	Rural		Urban
	(1)	(2)	(1)	(1)	(2)	(1)
Child Support Grant						
Constant term	2.852 (1.700) ***	2.679 (1.680) ***	2.746 (1.972) ***	-0.205 (0.698) ***	-0.187 (0.717) ***	2.273 (0.956) ***
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Linear and quadratic trend	Yes	Yes	Yes	Yes	Yes	Yes
Selected covariates	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.340	0.341	0.304	0.191	0.191	0.151
No. of observations	986	986	1,210	989	989	1,210
First stage: weak instrument test	283.644 (0.000)	152.666 (0.000)	590.204 (0.000)	283.644 (0.000)	152.666 (0.000)	530.073 (0.000)
	Below poverty lines		Above poverty lines	Below poverty lines		Above poverty lines
	(1)	(2)	(1)	(1)	(2)	(1)
Child Support Grant						
Constant term	2.701 (1.419) **	2.453 (1.394) **	-1.828 (3.316) **	0.032 (0.604) ***	0.015 (0.609) ***	5.057 (1.790) ***
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Linear and quadratic trend	Yes	Yes	Yes	Yes	Yes	Yes
Selected covariates	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.293	0.294	0.475	0.182	0.182	0.230
No. of observations	1,484	1,484	712	1,487	1,487	712
First stage: weak instrument test	839.137 (0.000)	435.108 (0.000)	76.691 (0.000)	845.358 (0.000)	438.322 (0.000)	76.691 (0.000)

Notes: See the list of selected covariates in Table 2. Robust standard errors are in brackets. P-value levels: * p<0.10, ** p<0.05, *** p<0.01. Model (1) has a linear specification, while model (2) has a non-linear specification. Tests for weak instruments: for model (1) the first-stage F statistic is reported, while for model (2) the Cragg and Donald (1993) statistic for more instruments is reported.

Before concluding, we present the graphical analysis for those sub-populations for which we found significant results in the IV framework. It represents, as previously, a robustness analysis in the parametric setting (Jacob *et al.* 2012).

Fig. 4.— *Per adult equivalent food expenditures by sub-populations: graphical evidence of the discontinuities around the cutoff*

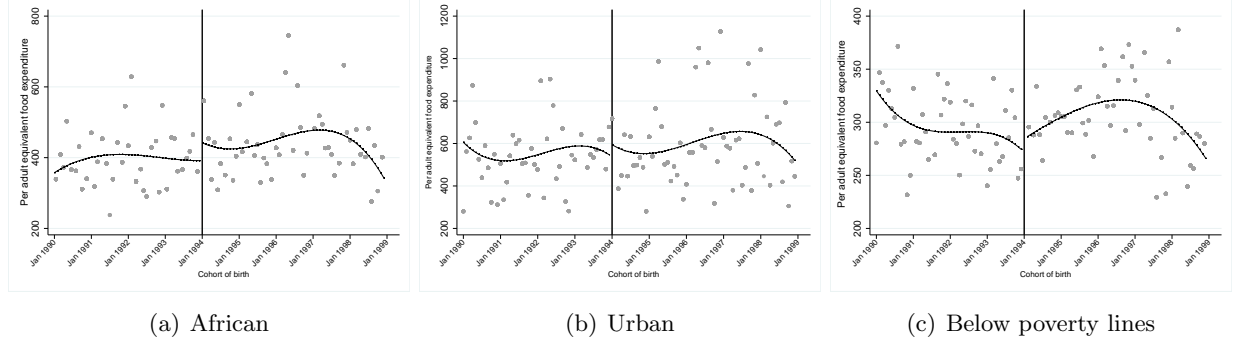


Fig. 5.— *Share of carbohydrates in food expenditures by sub-populations: graphical evidence of the discontinuities around the cutoff*

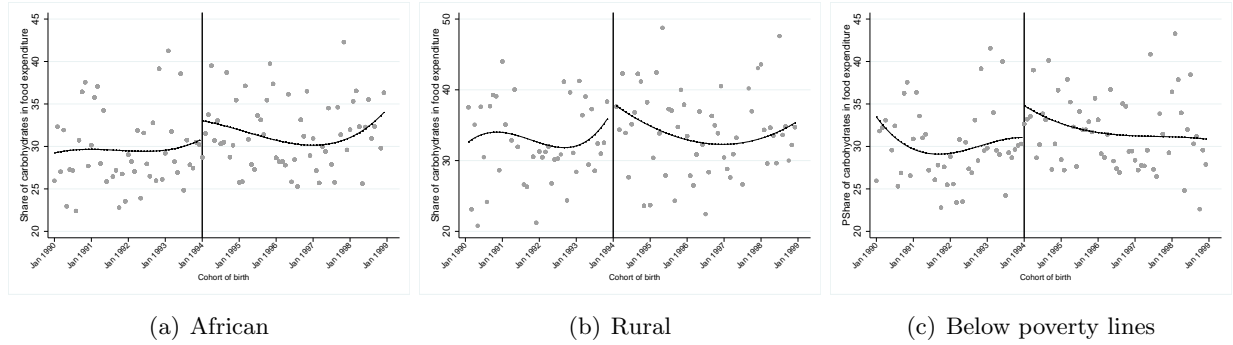
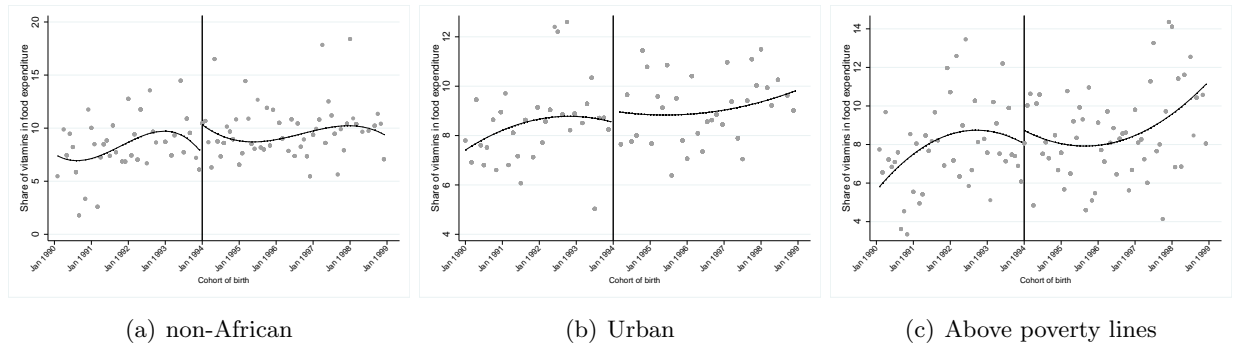


Fig. 6.— *Share of vitamins on food expenditures by sub-populations: graphical evidence of the discontinuities around the cutoff*



6. Conclusions

This paper assesses the impact of the South African CSG on food expenditure as a proxy of food access and on the dietary diversity of the beneficiary households.

We use the dataset provided by the National Income Dynamics Study covering years 2008, 2010-2011 and 2012 and carry out a RDD to estimate the change in per adult equivalent food expenditure and in the share of carbohydrates, proteins and vitamins in food expenditure.

Our analysis shows that the unconditional transfers provided by the CSG have proved to be effective in sustaining the purchasing power of the beneficiary households, which increase their food expenditure. We also find that this higher expenditure is reflected in an increase in the share of carbohydrates (principally cereals) and vitamins (fruit and vegetables) in food expenditure, while it does not contribute to a greater access to other food groups such as proteins (meat, fish and dairy products).

We also question whether the CSG is particularly effective for the main target groups of the programme: the African headed households, the rural people, the very poor (those lying below the poverty lines).

The analysis shows that, for the more disadvantaged groups (African headed households, rural households and the income poorest), the grant only contributes to increase the share of carbohydrates, while for the non-African headed households, the urban people and the non-poor households, the grant is useful to increase the share of vitamins in food expenditure. Thus, as cereals are the most consumed food groups among the poorest households, the CSG does not seem to be effective in allowing significant changes in the dietary habits of the beneficiaries households and in guaranteeing a nutritionally adequate food basket.

These results suggest that, in the South African context of large scale poverty and inequality, where households largely rely on social grants, long term poverty reduction and food security strategies might contribute more effectively to increasing food and nutrition outcomes than the support to household income.

As part of this strategy, also considering that South Africa is characterized by an exceptionally high rate of unemployment, a contributor to food security might be the enhancement of the smallholders agricultural production that could increase access to food, especially in the most remote rural areas, and could encourage food diversification.

Finally, positive nutritional outcomes should be encouraged by improving ancillary social services, including raising consumer education, so to enable households to consume more diverse and nutritionally adequate foods.

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The Impact of the Child Support Grant on Gender Inequality in the South African Labor Market

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Abstract

This paper aims to evaluate the differential effects of the South African Child Support Grant (CSG) on the employment opportunities and employment type that adult (15-64) women and men in beneficiary households experience over time. At this scope, we use the National Income Dynamics Study (NIDS) covering years 2008, 2010-2011 and 2012 and carry out a Regression Discontinuity Design that exploits the variation induced by the expansion in eligibility related to the child age. We find that the CSG is able to support women in participating in the labor market and in increasing their employment opportunities, while it does not affect the labor market status of men. Thus, the CSG contributes to reduce gender inequalities from the perspective of the labor market status. However, we also find that the CSG has a role in facilitating women to enter the labor market as self-employed or casual employed, while it has a less significant role in facilitating employment on a regular wage basis.

Keywords: Cash transfers, Regression discontinuity design, sub-Saharan Africa, gender inequality, labor supply.

JEL code: I38, C33, O55, J16, J22.

1. Introduction

With the end of racial discriminations imposed by apartheid, the South African constitution guarantees a basic principle of equality on the ground of race, color, ethnic and social origin, sex, religion or language. It enshrines moreover that “*everyone has the right to have access to social security, including, if they are unable to support themselves and their dependants, appropriate social assistance*”. As a matter of fact, South Africa spends 3.5 percent of GDP on social assistance programmes with social grants reaching more than a quarter of the population (Woolard *et al.* 2010).

Among these programmes, the Child Support Grant (CSG) is the most widespread: launched in 1998, it aims to remove racial and gender inequalities in the social support system by reaching vulnerable children and their households (Lund 2008). The long term objective is to break the vicious cycle of poverty.

Social grants dealing with support to children and women as the CSG have been welcomed for their positive economic, nutritional and education impacts, in particular on children¹. But still little is known about their impacts under a gender lens (Lund 2006; Patel *et al.* 2012), in particular for what concerns the labor market status. As a matter of fact, the theoretical pathways that link social grants and labor market outcomes are ambiguous and also the empirical evidence is far from conclusive.

This paper aims to contribute to this discussion by evaluating the impact of the CSG on the labor force participation, the employment opportunities and the employment type. It also assesses whether the programme increases or decreases gender differences in the labor market. To this aim, we focus on women and men of working age (15-64 years old) in the beneficiary households.

Several reasons justify the focus on gender inequalities from the perspective of the labor market status.

According to Agüero *et al.* (2007, 2010), the CSG, in 98 percent of the cases, is collected, managed and expended by women of the household where the child lives. Thus, even if the CSG was not specifically designed to promote gender equality, this grant especially affects women in the recipient households.

The potential effects of social grants on labor market status are, however, ambiguous from a theoretical point of view. On the one hand, the grant could discourage the participation in the labor market by increasing the reservation wage and recipients may more likely renounce to low job profiles, especially if the grant is redistributed and shared among the household members (Bertrand *et al.* 2003). Moreover, potential beneficiaries may reduce their labor supply in order to fall below the specified income threshold and become eligible for the grant (Moffitt 2002; Fiszbein *et al.* 2009).

¹For a review, see Eyal and Woolard (2011).

As a consequence, the grant may create dependence from the aid and reinforce women's role as mothers (Goldblatt 2005; Molyneux 2009; Patel 2012), even raising fertility rates (Devereux 2011).

South African women may be particularly affected by this potential disincentive effect: the unemployment rate is exceptionally high for both men and women, but women have lower probability than men to find an employment. Moreover, South African women remain overrepresented among the low-wage workers and the self-employed in the informal sector, employed in domestic work or unskilled occupations (Goldblatt 2005; Posel and Rogan 2009) and remain primarily responsible to provide family and children cares (Budlender and Lund 2011).

On the other hand, the grant may represent an important source of income, useful to relax liquidity constraints and to provide a financial support to cover the fixed costs of job seeking (as transports) (Posel *et al.* 2006) or to engage in self-employment by securing credit (Sabates-Wheeler and Devereux 2008; Gertler *et al.* 2012). Moreover, child related grants may subsidize childcare and education costs, allowing mothers to enter the labor force and to increase hours worked (Leibbrandt *et al.* 2013). In this case, women are empowered by the financial aid and their participation to the labor force may be encouraged (Van der Berg *et al.* 2010; Patel 2012).

Previous evidence found contrasting results on the effects of the CSG on labor market outcomes for women in recipient households.

Using data from the General Household Survey of 2002, 2003, 2004 and 2005, from the Labor Force Survey of 2004 and 2005 and from the National Treasury 2005 and 2007, Williams (2007) shows that the CSG has promoted both labor force participation and employment rates in grant-receiving households and that the effects are stronger for women.

Eyal and Woolard (2011) evaluate the impact of the CSG on women's employment probability and labor force participation. Using a dataset from the October Household Survey and the General Household Survey for the period 1997 to 2008, they found out that the CSG receipt is associated with a higher probability of being in the labor force and of being employed. The effects are particularly relevant if women become recipients in their twenties: the employment probability raises by 15 percent and the labor force participation by 9 percent.

However, studies focusing on gender relations highlight different findings. For example, Patel and Hochfeld (2011) use a household survey conducted in Soweto to show that the CSG provides a valuable safety net to poor households, especially in terms of food security, but women remain largely responsible for care and domestic duties. Thus, inequalities in gender relations remain largely unchanged.

To contribute to this ongoing debate, we use the dataset provided by the National Income Dynamics Study (NIDS) covering years 2008, 2010-2011 and 2012, and we carry out a Regression Discontinuity Design (RDD) that exploits the variation induced by the expansion in eligibility for the CSG related to the child age. Indeed, in 2010 South Africa extended the previous eligibility criteria: children born on or after 1st January 1994 became eligible until their 18th birthday, whereas those

born before 1994 lost eligibility at the age of 14. As a result of this policy change, there was a discontinuous increase in the probability of being a CSG beneficiary for households with children in the ages 14-18. This discontinuity provides a natural experiment for examining the causal effects of the programme across birth cohorts.

Following this identification structure, we explore whether the CSG affects the employment opportunities of adult women (15-64) and men in beneficiary households: we analyze the transitions from a state of non-employment registered in 2008 to a state of participation in the labor force and to an employment status occurred in 2010 - when the CSG eligibility rule changed - and in 2012. Further, we consider the employment type by distinguishing between transitions occurred towards an employment on a regular wage basis, a self-employment or a casual employment status.

Our main conclusion is that the CSG has a positive effect on women's probability to participate in the labor market and on women employment opportunities, while it does not affect men's labor market status. We also find that the CSG has a role in facilitating women to enter the labor market as self-employed or casual employed, while it has a less significant role in facilitating employment on a regular wage basis. This means that the CSG partially improves gender equality under the perspective of labor market status and employment opportunities.

The paper is organized as follows: *Section 2* describes the South African labor market, with a focus on gender issues; *Section 3* provides an overview of the CSG programme; *Section 4* introduces the dataset, the identification strategy and the outcome variables of interest; *Section 5* defines the empirical framework; *Section 6* discusses the results and *Section 7* concludes.

2. Women in the South African labor market

With the end of apartheid in 1994, the South African labor market was reformed with the aim of putting forward strategies able to eliminate labor inequalities inherited from the past and to improve general working conditions for all South Africans. Among these strategies, specific Affirmative Action policies encouraged the traditionally disadvantaged groups to participate in the labor market. Among these groups, women - especially African women - were recognized as previously disadvantaged on a gender basis. In 1998, the Employment Equity Act aimed at promoting equal opportunities and affirmative actions, while eliminating unfair discrimination against, among other things, "*gender, sex, pregnancy, marital status, family responsibility*". In 2004, the Broad-based Black Economic Empowerment Act aimed at promoting the "*economic empowerment of all black people, including women*" through human resource development, ownership and control of businesses and assets, enterprise development and preferential procurement (Burger and Jafta 2010).

As a matter of fact, after the fall of apartheid, there was an unprecedented influx of entrants in the labor market, in particular of African women with low skill levels. The labor force participation of women expanded from 38 percent in 1995 to 46 percent in 2004 (Ntuli 2007). To date, the labor force participation rate of women is of 50,7 percent with an absorption rate of 36,9 percent (Stats

SA 2015).

The feminization of the South African labor force registered since the '90s is largely explained also by the increase in female education, the decline in the number of married women together with a corresponding increase in female headship of households, and the decrease in fertility rates (Casale and Posel 2002).

Nevertheless, the increase in women's labor supply is one of the reasons for high unemployment rates in the post-apartheid South Africa (Banerjee *et al.* 2008). In a context where unemployment is a structural problem affecting 25,1 percent of the South African working age population, women's labor supply is not completely absorbed by the labor market: 27.3 percent of women are strictly unemployed.

Moreover, a gender gap in unemployment rates emerges: women's unemployment rate is 4 percent higher than men (Stats SA 2015) and women register disadvantaged positions in the labor market compared to men.

In fact, women - especially African women - are mainly self-employed in the informal sector, employed in domestic work or in unskilled occupations or spend most of their time in unpaid work (Casale 2004; Banerjee *et al.* 2008). Moreover, they remain the main responsible in the household for childcare, thus being less continuous in participating in the labor market and more frequently working part time (Casale 2004; Banerjee *et al.* 2008). As a consequence, women stay overrepresented in employment positions with low and insecure earnings and, as a matter of fact, their average earning is 75 percent of that of men (Posel and Rogan 2009); moreover, the average hours worked by women is consistently higher compared to men (an average weekly hours worked of 41 hours against 45 hours of men) (Stats SA 2015).

3. The Child Support Grant (CSG)

As Niño-Zarazúa *et al.* (2012) stress, the end of the apartheid in South Africa gave urgency to introduce policies aimed at improving equity and integration. In 1996, the Constitution of the Republic of South Africa provided a right based approach to social protection and social assistance to eradicate inequalities inherited by the past.

Today, the South African social assistance programme, which amounts to 3.5 percent of the GDP, is wider and more effective compared to other African countries (Woolard *et al.* 2010). The core of the programme is the implementation of a number of cash transfer initiatives aimed at reducing the intergenerational transmission of vulnerability and poverty by raising households' income and encouraging investments in human capital. Cash transfers in South Africa are typically non-contributory social grants that do not require beneficiaries to meet specific conditionalities. The benefits are provided in the form of monthly income transfer to eligible beneficiaries. Eligibility is typically defined on a means test basis: the condition to qualify beneficiaries is that their income

is below specific ceilings, adjusted each year to take account for inflation.

South Africa has seven types of social grants targeted at children, older persons and people with disabilities (Department Social Development 2010)² that, overall, have reached 16.5 million people (more than 25 percent of the population) by March 2015 (SASSA 2015). The most important social grants are the Old Age Pension and the CSG which provide unconditional and regular income support to poor households with old people and children.

In this paper, we only focus on the CSG, which is the most widespread social grant, covering more than 11 million children (SASSA 2014). The grant targets children and is collected, managed and expended by the children's caregivers, defined by the programme as anyone who takes primary responsibility for meeting the daily care needs of the child, without getting paid for it.

According to Lund *et al.* (2008), the award to the child's "primary caregiver" - instead of the biological parents or the adoptive or foster parents - was an attempt to deal with the absence of many parents, especially fathers, who, during the colonial era and the apartheid, migrate to work, leaving children with grandmothers and aunts. This household structure, fluid and mobile, has been pronounced by the spread of HIV/AIDS. As a matter of fact, in 98 percent of the cases, the caregivers are women (Agüero *et al.* 2007, 2010).

The CSG was launched in April 1998 with the intention to support children in poverty and poor households, particularly in rural areas, who had been excluded from the social assistance during the apartheid (Pauw and Mncube 2007). The ideas behind this programme are, first, that child protection can be mediated by social transfer programmes' effectiveness in reducing poverty; secondly, that poverty is largely due to deficits in income and transfers are expected to reduce these deficits (Barrientos *et al.* 2014). In 1998, the grant was fixed at a level of R100 per month for each beneficiary child. From 2008 onwards, the amount has been adjusted every year to inflation. Thus, the grant level rose over years reaching R280 per month for each child in 2012 (and R320 in 2014) (Agüero *et al.* 2010; Woolard and Leibbrandt 2010).

At the beginning, the CGS was a conditional cash transfer: applicants were expected to participate in development programmes and give proof of immunization for their children. Anyway these programmes were not implemented in many areas and access to immunization was even harder for the more marginalized children that the grant intended to support. As a consequence, conditionalities were abolished because considered as barriers to receipt for many poor households (Budlender and Woolard 2006; Woolard *et al.* 2010). Since 2010, a "soft" behavioral condition was re-introduced and it is still in effect: it requires children to be enrolled and to attend school, but different thresholds are applied, recognizing that access to educational, health and employment services is harder in rural areas than in the urban ones. As, so far, the punitive measures (the suspension of transfers) in case of non-compliance have not been enforced, the Child Support Grant is considered

²The social grants are: the Older Persons Grant (or Old Age Pension), the Disability Grant, the Child Support Grant, the Care Dependency Grant, the Foster Child Grant, the War Veterans Grant and the Grant-In-Aid.

an unconditional cash transfer.

The CSG aims at reaching a great number of families and children on the basis of two eligibility criteria: the income of the recipients and the child age. Considering the income eligibility rule, the caregivers are selected on the basis of a means test which, during the start up phase of the project, was related to the household income. Since the programme reached only 21,997 children one year after the implementation, the means test was redirected from a household based measure to one which considered the personal income (net of other social assistance grants) of the caregiver (Woolard and Leibbrandt 2010). In 2008, the Department of Social Development defined the income threshold to be equal to ten times the value of the grant for single caregivers (double for married caregivers). Every caregiver can receive the grant for a maximum of six children.

With reference to the child age, when the programme was launched, the age eligibility was limited to children under 7, but later it gradually rose: in 2003 it was extended to children up to their 9th birthday, in 2004 up to their 11th birthday, in 2005 up to the 14th birthday. From the 1st January 2010, the eligibility was extended to adolescents covering all children born after 1st January 1994: these children became eligible up to their 18th birthday whereas those born before 1994 lost eligibility at 14 (Woolard *et al.* 2010; Van der Berg *et al.* 2010).

As a consequence, in 2010 a big discontinuity in the programme emerged. Comparing data across birth cohorts, this discontinuity in the CSG eligibility provides a sharp natural experiment to look at causal effects of the programme. Children born on 1st January 1994 turned 14 on 1st January 2008, and so the impacts of the policy change on affected cohorts are observable only from this point on.

4. Dataset and identification strategy

The NIDS, implemented by the South African Labour and Development Research Unit (SALDRU) at the University of Cape Town, is the first South African nationally representative panel study. The three available waves of the survey cover years 2008, 2010-2011 and 2012. This dataset is a face-to-face longitudinal survey of households resident in South Africa. The aim of the survey was to follow a sample of household members and register changes in households composition and migration and in households' incomes, expenditures, assets, access to social services, education, health, employment and other dimensions of well-being.

The sample design was stratified and two-stage clustered. In the first stage, 400 Primary Sampling Units (PSUs) were randomly selected from the Statistics South Africa (Stats SA) 2003 Master Sample of 3,000 PSU's within each district proportionally to the population. Then, 26,776 individuals during the first wave (2008), 28,551 individuals during the second wave (2010-2011) and 32,633 individuals during the third wave (2012) were successfully interviewed. The result is a panel

of individuals from more than 7,000 households.³

From the entire dataset, we selected those households with children in the age range 14-18 who experienced the policy change: the expansion in the CSG's age eligibility criteria introduced in 2010 for those children born on or after 1st January 1994. Since our panel data covers the period 2008-2012, we included children born from 1990 to 1998: cohorts prior to 1990 were excluded because never eligible for the grant in the period 2008-2012 as in 2008 they already turned 18, and cohorts born after 1998 were excluded because eligible for their entire childhood and, in 2008, still have not turned 14.⁴

We then restricted the sample to households with only one child receiving the CSG: in the households with more than one child, we could find both children who were born before and children who were born after 1st January 1994, so we would not be able to identify the sharp discontinuity due to the increase of the eligibility age. Among the non beneficiary households, we selected the information related just to one child, the one belonging to the birth cohort closest to the cohort of January 1994, in order to avoid repeated information at household level. We also excluded some inclusion errors: few children in cohorts from 1990 to 1994 who were not eligible on the basis of the age eligibility criteria declared to receive the grant.

Once obtained the final sample of households with one child born in the cohorts of interest, we proceeded in our identification strategy by selecting all the women and men in working age (15 to 64 years old) who reside with the selected sample of children in the cohorts of interest.

Following this strategy, we finally obtained a sub-sample of 3,578 adults associated to one beneficiary child in the 1990-1998 birth year range, for a total of 10,734 observations across the three waves. The sample is composed by 1,976 women and 1,602 men.

Table 1 reports the characteristics of all the individuals of our sample followed across the three waves. We distinguish by treatment group (adults in households with a child born after January 1994) and control group (adults in households with a child born before January 1994). Reported statistics show that our sample is well balanced between men (45 percent) and women (55 percent), while it is composed principally by African individuals (70 percent) resident in urban areas (59 percent), with an educational level of secondary school (72 percent). One third of the sample is represented by the heads of the household; 35 percent of the sample is married or lives with the partner, while 67 percent of the sample is widow/widower, divorced or separated or never married. Most of the individuals live in households with four (22 percent) or five (19 percent) members. 28 percent of the households have an old component (older than 65 years) and 20 percent of the

³Household members are defined as persons who have lived under the "roof" or within the same compound/homestead at least 15 days during the last 12 months or arrived in the last 15 days and the "roof" was not their usual residence. Moreover, the person should share food from a common "pot" and share resources from a common resource pool.

⁴We thus obtained a sample of children in the range from 10 (in 2008) to 22 (in 2012) years old.

households receive other social grants (the Old Age Pension or another child related grant).

Table 1 shows also that the treatment and the control group are well comparable as they are similar for observable characteristics. A remarkable difference between the two groups concerns the headship of the household and the marital status: in the treatment group, a +11 percent of individuals states to be the head of the household and +20 percent of individuals is married or lives with the partner.

4.1. Outcome variables

The NIDS surveys collect information about the employment status and employment type on the basis of the international guidelines set out by the International Labor Organization for measuring employment. We thus classify the selected women and men in working age (15-64 years old) in four mutually exclusive categories: *i)* the not economically active (NEA), defined as those individuals who did not work and did not express a desire for employment or self-employment in the four weeks prior to the survey; *ii)* the discouraged work seekers, defined as those who wanted to work but did not try to look for work or to start a business as they believed that there were no jobs available in their area, or were unable to find jobs requiring their skills, or they had lost hope of finding any kind of work; *iii)* the strictly unemployed (or searching unemployed), defined as those who wanted to work, were available to start working within a week and also did some activities to search work or to start a business⁵; *iv)* the employed, defined as those engaged in market productive activities in the week prior to the survey interview (even if only for one hour) (Sender 1996; Kingdon and Knight 2004). The labor force participants are both those who are employed and those strictly unemployed who are actively seeking employment.

This study aims to evaluate the role of the CSG in facilitating the labor market participation and the employment opportunities for women and men in beneficiary households. The NIDS panel data allows us to look at the experience of individuals over time in making employment transitions. We focus on transitions from a state of non-employment registered in 2008 to other labor market states occurred in 2010, 2011 and 2012. By considering the non-employment status - instead of the unemployment status - we include all the potential workers and capture the transitions of those who were not economically active and entered the labor market as well as those that were discouraged and re-entered the labor market.

In particular, we consider transitions *i)* into the labor force participation and *ii)* into a state of employment. We further consider the employment type and thus the transitions *iii)* into a state of employment on a regular wage basis (those who are paid a wage or salary to work, part time or

⁵These activities are: register at an employment agency; enquire at workplaces, farms or factories; place or answer to advertisements; search through job advertisements; look for land, building, equipment; wait at the side of the road; seek financial assistance to start a business.

Table 1: *Sample's socio-economic characteristics*

	Full sample	Treatment	Control	Difference
Gender				
Male	0.447	0.425	0.473	-0.048
Female	0.552	0.574	0.527	0.047
Population group				
African	0.707	0.674	0.745	-0.071
Colored	0.190	0.201	0.178	0.023
Asian/Indian	0.034	0.038	0.028	0.010
White	0.068	0.087	0.047	0.040
Geographical location				
Urban	0.591	0.611	0.568	0.043
Rural	0.409	0.388	0.432	-0.044
Education level				
No schooling	0.047	0.053	0.039	0.014
Primary	0.106	0.119	0.089	0.030
Secondary	0.726	0.686	0.771	-0.085
Higher degree	0.122	0.141	0.099	0.042
Head of household				
Yes	0.317	0.370	0.258	0.112
No	0.683	0.630	0.742	-0.112
Marital status				
Married/Living with partner	0.326	0.423	0.219	0.204
Widow/divorced/separated/never married	0.674	0.576	0.781	-0.205
Number of household members				
1 or 2	0.080	0.046	0.118	-0.072
3	0.174	0.179	0.168	-0.011
4	0.225	0.240	0.208	-0.032
5	0.192	0.203	0.180	-0.023
6 or more	0.329	0.331	0.326	0.005
Presence of an old person in the household				
Yes	0.284	0.250	0.322	-0.072
No	0.716	0.750	0.678	0.072
Household receive other grants				
Yes	0.206	0.181	0.235	-0.054
No	0.794	0.819	0.765	0.054
Household income (ln)	8.311	8.377	8.237	-0.140
Year survey				
2008	0.333	0.293	0.378	-0.085
2010	0.297	0.323	0.266	0.057
2011	0.037	0.030	0.044	-0.014
2012	0.333	0.353	0.311	0.042

Notes: i) Sample restricted to adults aged 15 to 65 belonging to households with at least one child born between 1990 and 1998. ii) Descriptive statistics of district of residence of households and month of the interview are omitted.

full time, on a regular basis); *iv*) into a state of self-employment (those who work for themselves, including in partnership with others) and *v*) into a state of casual employment (those who work for an employer on an irregular and short-term basis).

Table 2 presents transition matrices for labor market states. The employment status is differentiated according to the type of employment (regular wage, self- or casual employment), thus accounting also for transitions between different employment positions.⁶ As transitions are conditioned to a non-employment status in 2008, transitions between employment states are only occurred between 2010 and 2012.

The matrix shows that: *i*) adults 15-64 who in 2008 were not economically active entered the labor force in more than 25 percent of the cases, remaining strictly unemployed in 13.8 percent of the cases and finding an employment in almost 12 percent of the cases, principally on a regular wage basis (8 percent of the cases); *ii*) adults 15-64 who in 2008 were discouraged work seekers re-entered the labor force in about 35 percent of the cases, remaining strictly unemployed in 18.1 percent of the cases and finding an employment on a regular wage basis in 15.2 percent of the cases; *iii*) roughly, 33 percent of the strictly unemployed adults found an employment between 2008 and 2012: in 20.9 percent of the cases on a regular wage basis, in 5.9 percent of the cases as self-employed and in 6.5 percent of the cases as casual employed.

We can also observe that regular wage employment is relatively stable compared to self-employment and casual employment: 61 percent of the individuals remains employed on a regular wage basis, while only in 1.6 percent of the cases they move to self-employment and only in 3.3 percent of the cases to casual employment. Moreover, we can observe that those who were self-employed or casual employed in 2010, moved away from employment much more frequently than those employed on a regular wage basis: 40 percent of the self-employed became not economically active, 5 percent became discouraged work seekers and 20 percent became strictly unemployed; 27 percent of the casual employed became not economically active, 4.4 percent became discouraged work seekers and 15.5 percent became strictly unemployed. 33 percent of the casual employed, nevertheless, moved to a regular wage employment.

The limited number of transitions that we observe from a non employment status to self-employment and casual employment and, in contrast, the high frequency of transitions from self-employment and casual employment to non-employment states may be explained - at least partially - by the limited role of the South African informal sector in absorbing unemployed individuals. Indeed, the South African informal sector is much less developed than in other developing countries: according to Kingdon and Knight (2004), during the apartheid regime, informal activities of black South Africans were repressed and, even after the end of apartheid, the lack of entrepreneurial skills and

⁶In theory, the categories for the employment type are not mutually exclusive as it is possible for an individual to combine, for example, an employment on a regular wage basis and a casual employment. Nevertheless, in our sample, very few units fit into two categories at the same time.

Table 2: Labor status transitions for the period 2010-2012, conditional on non-employment status in 2008

Final state							
Initial state	NEA	Discouraged	Unemployed	All adults (15-64)			Tot.
				Regular wage	Self-employed	Casual employed	
NEA	69.14	4.77	13.86	8.00	1.86	2.36	100.00
Discouraged	54.97	7.60	18.13	15.20	3.51	0.58	100.00
Unemployed	38.81	4.82	22.95	20.96	5.95	6.52	100.00
Regular wage	16.53	3.31	14.05	61.16	1.65	3.31	100.00
Self-employed	40.00	5.00	20.00	10.00	20.00	5.00	100.00
Casual employed	26.67	4.44	15.56	33.33	8.89	11.11	100.00
Tot.	61.43	4.88	15.32	12.59	2.80	2.97	100.00
Initial state	NEA	Discouraged	Unemployed	Adult women (15-64)			Tot.
				Regular wage	Self-employed	Casual employed	
NEA	70.56	5.00	13.95	6.94	2.02	1.53	100.00
Discouraged	60.17	8.47	17.80	10.17	2.54	0.85	100.00
Unemployed	44.54	6.11	23.58	16.16	5.24	4.37	100.00
Regular wage	20.63	3.17	7.94	60.32	3.17	4.76	100.00
Self-employed	45.83	0.00	25.00	0.00	25.00	4.17	100.00
Casual employed	27.78	11.11	5.56	22.22	22.22	11.11	100.00
Tot.	63.65	5.32	15.37	10.46	3.07	2.13	100.00
Initial state	NEA	Discouraged	Unemployed	Adult men (15-64)			Tot.
				Regular wage	Self-employed	Casual employed	
NEA	67.29	4.48	13.75	9.38	1.67	3.44	100.00
Discouraged	43.40	5.66	18.87	26.42	5.66	0.00	100.00
Unemployed	28.23	2.42	21.77	29.84	7.26	10.48	100.00
Regular wage	12.07	3.45	20.69	62.07	0.00	1.72	100.00
Self-employed	31.25	12.50	12.50	25.00	12.50	6.25	100.00
Casual employed	25.93	0.00	22.22	40.74	0.00	11.11	100.00
Tot.	58.40	4.28	15.27	15.51	2.42	4.12	100.00

social networks inhibited the creation of an informal sector and the emergence of self-employment activities.⁷

Looking at the transitions by gender, *Table 2* also shows that: *i*) women that were not economically active in 2008 had a lower probability than men to enter the labor force and to find an employment on a regular wage basis (6.9 percent against 9.4 percent) or casual employment (1.5 percent against 3.4 percent) while more frequently women became self-employed (2 percent against 1.7 percent); *ii*) women that were strictly unemployed in 2008 more frequently than men become discouraged

⁷The information from the NIDS dataset does not allow to properly distinguish between formal and informal sector.

(6 percent against 2.4 percent) and remained unemployed (23.5 percent against 21.7 percent); on the contrary, less frequently than men found an employment on a regular wage basis (16.1 percent against 29.8 percent), but also as self-employed (5.2 percent against 7.3 percent) or casual employed (4.4 percent against 10.5 percent); *iii*) women that were employed in 2010 more frequently than men exited the labor force and more frequently became strictly unemployed.

With regard to the transitions between different types of employment, we observe that women more frequently than men move from a regular wage position to self-employment (3.1 percent against 0 percent) or to casual employment (4.7 percent against 1.7 percent). In contrast, transitions from self-employment or casual employment to a regular wage positions are less frequently registered among women than among men: self-employed women never move to a regular wage employment against the 25 percent of the men and casual employed women move to a regular wage employment only in 22 percent of the cases against the 40.7 percent of the cases of men.

5. The empirical framework

A regression discontinuity design (RDD) allows to estimate the treatment effects of a programme in a non-experimental setting. When the agents do not have a complete control over the assignment variable⁸, it is “as good as randomized” in the neighborhood of the discontinuity cutoff (*Local Random Assignment*) (Lee 2008; Lee and Lemieux 2010). In the case of the CSG, the access to more years of cash transfers (for children born on or after 1st January 1994, from the 14th up to the 18th birthday) is only determined by the age eligibility and, hence, does not represent an issue for internal validity. Indeed, individuals are not able to manipulate their date of birth and thus have approximately the same probability of having an assignment variable that is just above (receiving the treatment) or below (being denied the treatment) the cutoff of January 1994.

The Local Random Assignment implies that the discontinuity gap at the cutoff identifies the treatment effect of interest (τ) or that:

$$\lim_{\epsilon \downarrow 0} Pr(Y|X = c + \epsilon) - \lim_{\epsilon \uparrow 0} Pr(Y|X = c + \epsilon) = \tau \quad (1)$$

where X is the assignment variable (the birth cohort of children) which is deterministically related to the cutoff point c (January 1994), Y is the outcome variable of interest (i.e. the employment status) and ϵ determines the neighbor in which the Local Random Assignment is satisfied.

Since the participation in the CSG programme is not compulsory, some households with eligible children do not apply for the grant. This means that the assignment variable X influences but does

⁸Formally, this hypothesis ensures that the stochastic error component in the assignment variable is continuously distributed.

not completely determine the treatment variable $D \in \{0, 1\}$ (the jump at c is smaller than 1) and a fuzzy RDD is required. In this case, only the individuals who were assigned to the treatment and who actually participated in the treatment may expect a treatment variation after crossing the age of birth cutoff.

The conditional probability $Pr(D = 1|X = c)$ is thus known to be discontinuous at c (Hahn *et al.* 2001), that is:

$$\lim_{\epsilon \downarrow 0} Pr(D = 1|X = c + \epsilon) \neq \lim_{\epsilon \uparrow 0} Pr(D = 1|X = c + \epsilon) \quad (2)$$

Therefore, in the case of fuzzy RDD, the treatment effect is obtained by dividing the jump in the relationship between Y and X at c (equation 1) by the difference at the cutoff of the probability for the compliers of being treated (equation 2). The treatment effect in the fuzzy RDD (defined as τ_F) thus is:

$$\tau_F = \frac{\lim_{\epsilon \downarrow 0} E(Y|X = c + \epsilon) - \lim_{\epsilon \uparrow 0} E(Y|X = c + \epsilon)}{\lim_{\epsilon \downarrow 0} E(D|X = c + \epsilon) - \lim_{\epsilon \uparrow 0} E(D|X = c + \epsilon)} \quad (3)$$

where the denominator is different from zero because of the known discontinuity of $E(D|X)$ at c .

If there is a Local Random Assignment, equation 3 provides an unbiased estimate of a weighted version of the Local Average Treatment Effect (LATE), where the impact of the programme is evaluated on compliers: individuals assigned to the treatment and who actually participated in the treatment, compared to those who were assigned to the control group and did not participate in the treatment (Jacob *et al.* 2012).

Interestingly, equation 3 shows a close analogy between the fuzzy RDD and the Wald formulation of the treatment effect in an instrumental variable setting (IV). The IV formulation requires the monotonicity and the excludability related to the assignment variable when it crosses the cutoff point (Hahn *et al.* 2001).⁹ When these assumptions hold, the treatment effect in the fuzzy RDD can be written as:

$$\tau_F = E[Y(1) - Y(0)|household is a complier, X = c] \quad (4)$$

where $Y(1)$ and $Y(0)$ respectively represent the realization of the outcome variable after and before the cutoff point c and the “compliers” are units who get the treatment if the cutoff is at X or higher, but they do not get the treatment if the cutoff is below X (Lee and Lemieux 2010).

⁹Under the “monotonicity” assumption, when X crosses the cutoff point c it cannot simultaneously cause some units to take up and others to reject the treatment.

Under the “excludability” assumption, X crossing the cutoff c cannot impact Y except through impacting receipt of treatment (Hahn *et al.* 2001)

This structure is useful to set-up an estimation strategy built on the comparison of a local polynomial estimator (LP) with a parametric estimator through IV. The local polynomial estimator approximates the regression functions above and below the cutoff by means of weighted polynomial regressions, with weights computed by applying a kernel function to the distance of each observation's score to the cutoff. For the choice of the most appropriate bandwidth, we follow Calonico *et al.* (2014).

The application of the LP provides an immediate graphical representation of the relation of interest, without introducing any relevant individual characteristic. More in detail, it gives a graphical representation of the link between the assignment variable X and the treatment dummy D described in equation 5 and between the assignment variable X and the outcome variables Y described in equation 6 in the neighbor of the cutoff point. Further, it provides an inspection of the functional form in the RDD, useful also to set-up a robustness analysis in the parametric setting (Jacob *et al.* 2012).¹⁰

To estimate equation 4 in an IV framework, given that the monotonicity assumption holds (Hahn *et al.* 2001), we impose a linear form on the two-sided relationship among the assignment variable, the treatment dummy and the outcome variable.

The first stage and reduced form regression equations are:

$$D_i = \alpha_0 + \alpha_1 X_i + W_i' \alpha_2 + \alpha_3 G_i + \alpha_4 T_i + \Psi \quad (5)$$

$$Y_i = \beta_0 + \beta_1 D_i + W_i' \beta_2 + \beta_3 G_i + \beta_4 T_i + \Phi \quad (6)$$

where W is a matrix of individuals' relevant characteristics as gender, education, population group, geographical location, relation to the head of household and marital status, household size and income level.¹¹ To limit the effects of unobserved heterogeneity and to capture changes in the economic and labor market situation at local level, G_i includes a set of binary variables for districts and T_i includes a set of binary variables for the month and year of interview. Ψ and Φ are error terms.

Y_i describes, one by one, the transition into: *i)* the labor force, *ii)* the employment status, *iii)* the employment status on a regular wage basis, *iv)* the self-employment status and *v)* the casual employment status. All the outcome variables are conditioned to the individuals' non-employment state registered in the first wave (2008), so that the outcomes identify the transitions occurred in 2010/2011 and 2012.

The corresponding structural equation can be obtained as:

$$Y_i = \rho_0 + \rho_1 D_i + W_i' \rho_2 + \rho_3 G_i + \rho_4 T_i + \Omega \quad (7)$$

¹⁰In line with Jacob *et al.* (2012), we will not provide estimation results of the equation 4 using the local polynomial estimator, since the sample of households is too small and the estimates may be biased. As a consequence, only parametric estimates are presented.

¹¹See Table 1 for descriptive statistics.

where the instrumental variable estimate of the coefficient ρ_1 is obtained by the ratio of the reduced form coefficient of the assignment variable in equation 6 and 5, that is $\rho_1 = \beta_1/\alpha_1$.

We also consider that the eligibility criteria of the CSG also foresees a means test. We do not have a complete control over the effects of the change in the income eligibility rule: first, even if the household income is a good proxy for the caregiver's income, data are not accurate enough to determine whether the caregiver's income (and that of her/his spouse) makes the children eligible or not for the grant; second, individuals may be able to manipulate their income threshold; third, data about household income may be inaccurate (Eyal and Woolard 2011). For these reasons, we included the households' income in the W matrix of selected covariates, but to check that the income requirement does not influence the estimated results, in model (2), we drop it from the estimates. We thus compare the estimated parameters in model (1) and (2).

Finally, as stressed by Jacob *et al.* (2012), more sophisticated functional forms may be used as robustness checks of the linear formulation. Thus, in model (3), we include non linearities in equation 5, 6 and 7 by introducing a second and third-degree polynomials of the assignment variable and compare the estimated parameters in models (1) and (3) (Van der Klaauw 2002).

Each model is estimated for all adults (15-64) in the sample and for the subsamples of women and men: the aim is to consider the gender differences that raise in the CSG's impact on labor market states.

6. Results and robustness analysis

Before presenting the main results of the analysis, we will give some insights into the internal validity of the Regression Discontinuity Design. Since the CSG beneficiaries do not have a complete control over the assignment variable, i.e. the birth cohort, the Local Random Assignment assumption is not an issue in the present analysis and equation 2 always identifies the treatment effect of interest.

Fig. 1.— *Internal validity of the fuzzy regression discontinuity design*

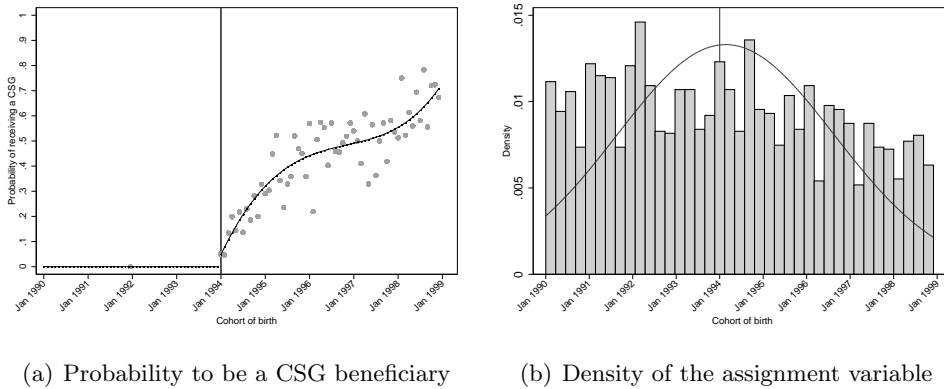


Figure 1 gives a graphical representation of the link between the assignment variable X (the birth cohort of children) and the treatment dummy D (the probability of participating in the CSG programme) described in equation 5 (panel *a*) and displays the density function of the assignment variable by monthly cohorts of birth (panel *b*).

Figure 1(*a*) shows that the fuzzy structure of the RDD is correctly identified, since the probability of participating in the CSG programme is zero for children born before January 1994 (the left side of the cutoff), whereas it changes by less than one as the assignment variable crosses the cutoff value (the right side of the cutoff). For children exposed to the CSG programme change during the time span from 2008 to 2012, the probability to participate in the programme ranges between 10 and 70 percent.

Further, in Figure 1(*b*), we also inspect a graph of the density of the assignment variable, showing that there are no discontinuities in the number of observations just above or below the cutoff and that the distribution of the assignment variable is homogeneous in the neighbor of the cutoff (Jacob *et al.* 2012). By presenting together these two graphs we show, first, that there is a discontinuity in the probability to receive a CSG given the birth cohorts and, secondly, that this discontinuity is not depending on the distribution of children across different cohorts.

Fig. 2.— Probability to participate in the labor force - conditional on non-employment status in 2008

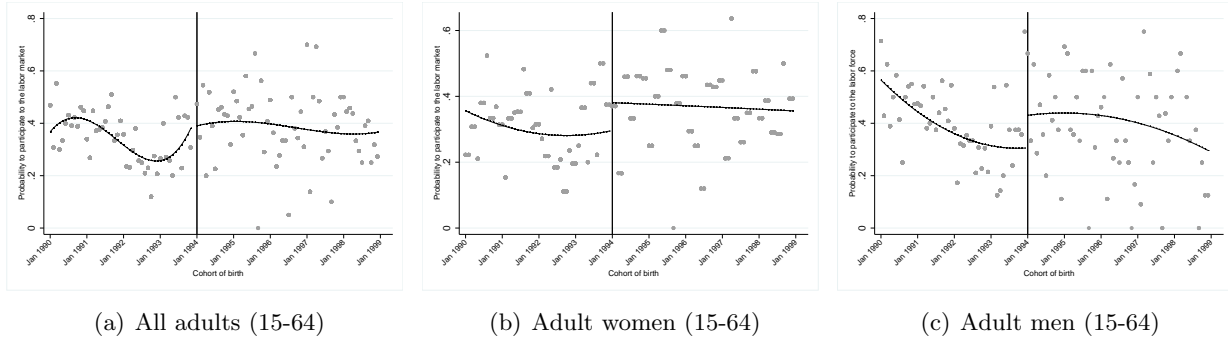
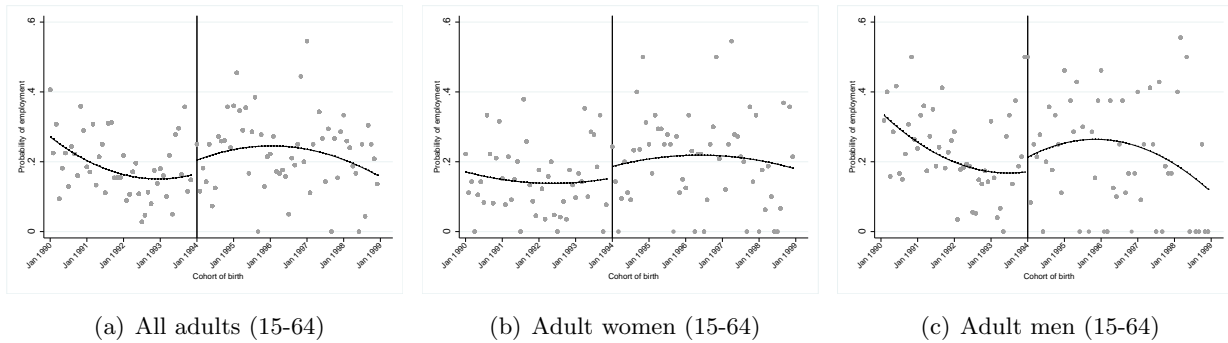


Fig. 3.— Probability of employment - conditional on non-employment status in 2008



Following the methodological outline described in the previous section, we present the outcomes of the local polynomial estimator (Calónico *et al.* 2014) for the entire sample of adults in working age (15-64) and for the subsamples of adult women (15-64) and adult men (15-64).

Figures 2 and 3 present such estimates when we take into account the transitions from a non-employment status registered in 2008 to a status of labor force participation and employment, respectively. We find a clear discontinuity in the probability to participate in the labor force from the *panel (b)* relative to women. In particular, in the neighbor of the cutoff of *panel (b)* we see a jump of 0.1 percentage points. A discontinuity is also found in the probability of employment from *panel (a)* and *panel (b)*, but it is less evident.

Figures 4, 5 and 6 present the outcomes of the local polynomial estimator when we take into account the transitions from a non-employment status registered in 2008 to a status of employment on a regular wage basis, self-employment and casual employment, respectively.

We find a discontinuity in the probability of employment on a regular wage basis and in the probability of self-employment only for women (15-64) (*panel (b)*), but the jumps are limited. For the casual employment, as the sample is too small, graphical evidence is not very informative.

For men, in *panel (c)* relative to all the outcome variables, we find no evidence of discontinuity.

Fig. 4.— *Probability of employment on a regular wage basis - conditional on non-employment status in 2008*

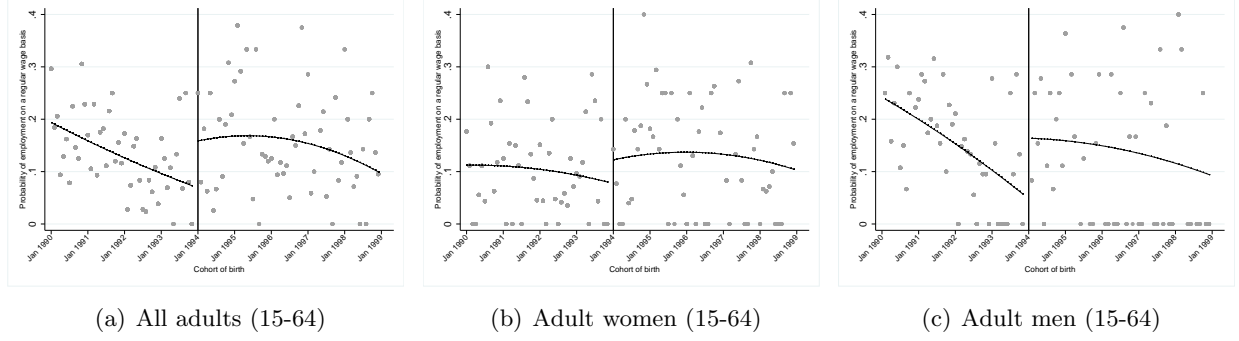


Fig. 5.— *Probability of self-employment - conditional on non-employment status in 2008*

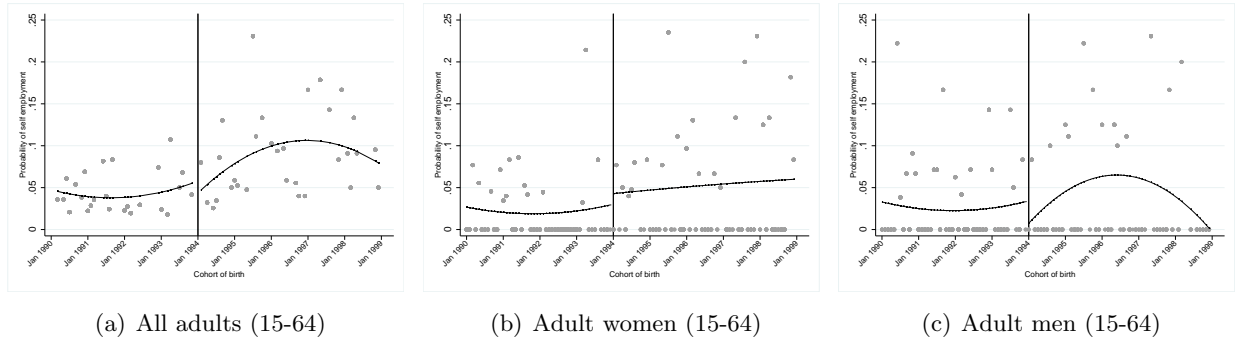
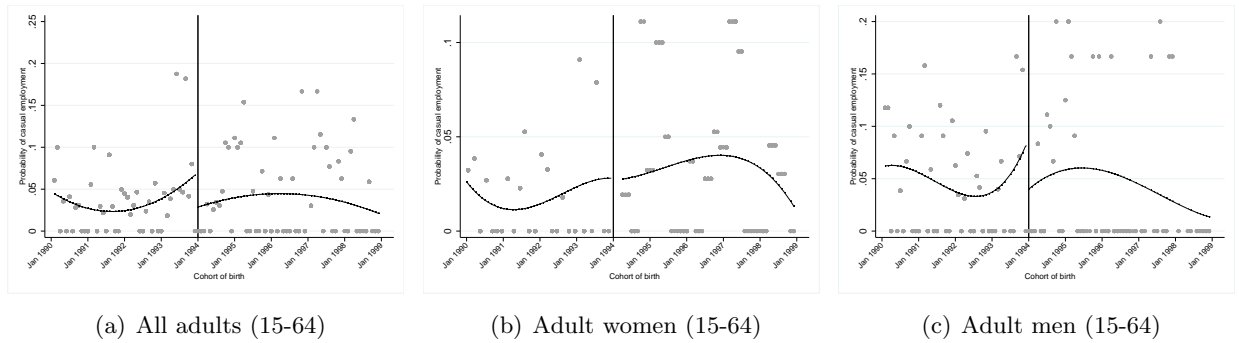


Fig. 6.— *Probability of casual employment - conditional on non-employment status in 2008*



As stressed by Jacob *et al.* (2012), if the sample is small as it is in our case, the LP estimator may be biased. Thus, we proceed in our analysis by presenting parametric estimates from an IV framework.

Table 3 and *Table 4* list the estimates of employment status conditional on the non-employment status in 2008. Estimates are calculated for the entire sample of adults in working age (15-64) and for the subsamples of adult women (15-64) and adult men (15-64).

We present results from three models: the first one (1) considers a linear functional form, the second one (2) excludes the household income as a covariate (to check for the irrelevant role of the income eligibility rule) and the third one (3) considers a non-linear functional form of the assignment variable. All the estimates are clustered for households. For each model, we test whether the instruments are weak: thus, for models (1) and (2) we report the first-stage F statistic, while for model (3) where there are more instruments, we report the Cragg and Donald (1993) statistic.

First, we can see that the three models produce similar results. Thus, we can conclude first, that the household income used in models (1) and (3) to control for the income eligibility rule does not relevantly affect the results. Indeed, as already mentioned, the income threshold is not an accurate assignment variable as susceptible of being manipulated by the grant applicants and, moreover, the programme does not implement any proper control on the income level once the individuals are selected as grants' beneficiaries.

Second, the linear specification of the assignment variable provides stable and reliable estimates.

From *Table 3*, we can see that the CSG has an effect in increasing the probability to participate in the labor force (if in 2008 the individual was non-employed) only for women, with about 13 percentage points.

The CSG has also an impact on the probability of employment (always conditional on a non-employment status in 2008): considering all adults in working age (15-64), the CSG has an effect in increasing the employment probabilities by 5 percentage points, but while for women this effect is significant and equals 11 percentage points, for men it is not.

We proceed in our analysis by distinguishing by employment type. *Table 4* shows that, for the full sample of adults in working age (15-64), the CSG does not produce a significant effect on the probability to be employed on a regular wage basis or as casual employed, while it is strongly significant and equals 5 percentage points on the probability to be self-employed.

Once again, focusing on the subsamples of women and men, we find that the CSG has an impact only on women. The CSG's effect is positive but poorly significant with reference to the probability to be employed on a regular wage basis. On the contrary, it is very significant and equals 6 percentage points as far as the probability of being self-employed is concerned. Finally, it is also significant but lower than the self-employment (4 percentage points) as far as the probability of being casual employed is concerned.

Table 3: Probability to participate in the labor force and probability of employment conditional on non-employment status in 2008

Probability to participate to the labor force									
	All adults (15-64)			Adult women (15-64)			Adult men (15-64)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Child Support Grant	0.050 (0.042)	0.047 (0.041)	0.086 (0.038)	0.130 (0.050)	0.127 (0.049)	0.134 (0.047)	-0.055 (0.066)	-0.058 (0.066)	0.019 (0.060)
Constant term	0.025 (0.193)	0.224 (0.183)	0.014 (0.192)	0.023 (0.190)	0.225 (0.177)	0.022 (0.189)	-0.408 (0.262)	-0.212 (0.234)	-0.416 (0.255)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selected covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income (ln)	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
R^2	0.128	0.126	0.129	0.137	0.134	0.137	0.188	0.186	0.192
No. of observations	3,296	3,296	3,296	1,888	1,888	1,888	1,408	1,408	1,408
First stage									
weak instrument test	643.738 (0.000)	637.990 (0.000)	243.757 (0.000)	504.678 (0.000)	493.584 (0.000)	183.757 (0.000)	308.338 (0.000)	306.604 (0.000)	121.768 (0.000)
Probability of employment									
	All adults (15-64)			Adult women (15-64)			Adult men (15-64)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Child Support Grant	0.059 (0.032)	* 0.054 (0.032)	0.083 (0.030)	0.114 (0.041)	0.109 (0.040)	0.111 (0.039)	0.003 (0.057)	-0.004 (0.058)	0.055 (0.052)
Constant term	-0.287 (0.166)	* 0.127 (0.148)	-0.294 (0.166)	-0.169 (0.186)	0.174 (0.165)	-0.168 (0.185)	-0.719 (0.238)	*** -0.193 (0.217)	*** -0.725 (0.233)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selected covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income (ln)	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
R^2	0.118	0.104	0.118	0.120	0.108	0.120	0.182	0.161	0.185
No. of observations	3,363	3,363	3,363	1,916	1,916	1,916	1,447	1,447	1,447
First stage									
weak instrument test	626.794 (0.000)	620.975 (0.000)	232.609 (0.000)	499.462 (0.000)	486.903 (0.000)	180.469 (0.000)	304.409 (0.000)	303.327 (0.000)	116.670 (0.000)

Notes: See the list of selected covariates in Table 1. Robust standard errors, clustered at household level, are in brackets. P-value levels: * p<0.10, ** p<0.05, *** p<0.01. Models (1) and (2) have a linear specification, while model (3) has a non-linear specification. Tests for weak instrument: for models (1) and (2) we report the first-stage F statistic, for model (3) we report the Cragg and Donald (1993) statistic for more instruments.

Table 4: *Probability of employment by employment type, conditional on non-employment status in 2008*

Probability of employment on a regular wage basis									
	All adults (15-64)			Adult women (15-64)			Adult men (15-64)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Child Support Grant	0.017 (0.030)	0.012 (0.030)	0.040 (0.027)	0.066 (0.036)	* (0.061)	0.063 (0.035)	-0.022 (0.055)	-0.032 (0.056)	0.028 (0.049)
Constant term	-0.249 (0.143)	* (0.153)	-0.257 (0.143)	-0.212 (0.170)	0.131 (0.151)	-0.210 (0.170)	-0.459 (0.216)	0.071 (0.200)	** (0.212)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selected covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income (ln)	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
R^2	0.126	0.108	0.127	0.132	0.116	0.132	0.199	0.173	0.201
No. of observations	3,133	3,133	3,133	1,796	1,796	1,796	1,337	1,337	1,337
First stage: weak instrument test	593.789 (0.000)	587.704 (0.000)	223.608 (0.000)	468.230 (0.000)	454.399 (0.000)	169.130 (0.000)	284.432 (0.000)	284.700 (0.000)	110.973 (0.000)

Probability of self-employment									
	All adults (15-64)			Adult women (15-64)			Adult men (15-64)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Child Support Grant	0.054 (0.019)	*** (0.019)	0.053 (0.018)	0.065 (0.025)	*** (0.025)	0.060 (0.024)	0.042 (0.029)	0.041 (0.029)	0.032 (0.026)
Constant term	-0.108 (0.052)	** (0.045)	-0.108 (0.052)	-0.102 (0.070)	-0.052 (0.059)	-0.101 (0.069)	-0.180 (0.088)	-0.103 (0.080)	** (0.088)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selected covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income (ln)	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
R^2	0.061	0.060	0.062	0.078	0.077	0.078	0.116	0.113	0.116
No. of observations	2,782	2,782	2,782	1,641	1,641	1,641	1,141	1,141	1,141
First stage: weak instrument test	563.450 (0.000)	558.267 (0.000)	207.125 (0.000)	421.539 (0.000)	413.560 (0.000)	148.587 (0.000)	277.654 (0.000)	279.641 (0.000)	108.984 (0.000)

Probability of casual employment									
	All adults (15-64)			Adult women (15-64)			Adult men (15-64)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Child Support Grant	0.017 (0.017)	0.016 (0.017)	0.024 (0.015)	0.040 (0.018)	** (0.018)	0.034 (0.017)	-0.003 (0.035)	-0.004 (0.035)	0.013 (0.031)
Constant term	-0.103 (0.057)	* (0.046)	-0.104 (0.057)	-0.019 (0.054)	-0.019 (0.048)	-0.018 (0.054)	-0.360 (0.122)	-0.296 (0.107)	*** (0.121)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Selected covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household income (ln)	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
R^2	0.065	0.065	0.065	0.100	0.100	0.102	0.096	0.095	0.097
No. of observations	2,787	2,787	2,787	1,621	1,621	1,621	1,166	1,166	1,166
First stage: weak instrument test	569.835 (0.000)	563.802 (0.000)	211.929 (0.000)	423.213 (0.000)	414.282 (0.000)	149.765 (0.000)	288.218 (0.000)	288.437 (0.000)	113.629 (0.000)

Notes: See the list of selected covariates in Table 1. Robust standard errors, clustered at household level, are in brackets. P-value levels: * p<0.10, ** p<0.05, *** p<0.01. Models (1) and (2) have a linear specification, while model (3) has a non-linear specification. Tests for weak instrument: for models (1) and (2) we report the first-stage F statistic, for model (3) we report the Cragg and Donald (1993) statistic for more instruments.

7. Conclusions

This paper estimates the impact of the South African CSG on gender inequality from the perspective of the labor market status.

We use the dataset provided by the NIDS covering years 2008, 2010-2011 and 2012 and carry out a RDD to estimate the impact of the CSG on the labor market outcomes of the beneficiaries. We also disaggregate the sample of adults in working age (15-64) by gender so as to assess the impact on gender equality.

In particular, we evaluate the effects of the CSG on the probability to participate in the labor force and to be employed, conditional on a non-employment status registered in 2008. We also differentiate among the probability of being employed on a regular wage basis, of being self-employed or casual employed, also conditional on a non-employment status in 2008.

Our evaluation shows that the CSG has a positive effect on women's labor market status, whereas it does not produce any effect on men in the beneficiary household. This can be explained by the fact that women are, in most cases, the beneficiary children's actual caregivers who can ask for the grant, receive and manage it. Our results are thus consistent with those of Williams (2007) and Eyal and Woolard (2011).

In particular, the treated women are more likely to participate in the labor force (almost 13 percentage points) and more likely to be employed (11 percentage points) if they were non-employed in 2008 than those in the control group. Moreover, the CSG positively affects women's employment probabilities, especially as self-employed (6 percentage points) and as casual employed (4 percentage points), whereas it shows a poorly significant impact on regular wage employment.

In summary, the CSG contributes to reduce gender inequalities from the perspective of the labor market status by encouraging participation and by raising employment opportunities. This is a positive effect, especially if we consider that the CSG was not designed to promote women empowerment. What we are observing thus represents an indirect and unintentional effect of the programme.

However, women find working opportunities mainly as self-employed and casual employed, which are lower and less stable earning positions if compared to the employment on a regular wage basis (Kingdon and Knight 2004). Thus, programmes and policies that can expand liquidity constraints in low-income households and that are specifically designed to expand employment and self-employment opportunities may be more effective than a cash transfer targeted to women and children - as the CSG - in reducing gender gaps in the labor market and, as a consequence, unemployment rates.

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