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Giorgio d'Agostino – Margherita Scarlato

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Via Silvio D'Amico, 77 - 00145 Roma
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E-mail: astril@uniroma3.it
http://host.uniroma3.it/associazioni/astril

Cash transfers, labor supply and gender inequality: Evidence from South Africa

Giorgio d'Agostino[1], Margherita Scarlato[1,]

Abstract

This paper provides an empirical analysis of the impact of the Child Support Grant (CSG) implemented in South Africa on the labor supply of the parents of beneficiary children. Our aim is to assess, by evaluating potential heterogeneity of the effects by gender, whether and to what extent the program improved or lessened gender inequality in the labor market. We use data from a national panel survey, the National Income Dynamics Study, and apply a fuzzy regression discontinuity design that exploits an expansion in eligibility due to a discontinuous change in the age eligibility criterion. The results show that the CSG had a negative effect on the probability of parents of beneficiary children being employed and mixed effects on the participation in the labor force, with substantial heterogeneity by gender and by other individual and household characteristics. Overall, the evaluation suggests that the program provided support to the members of vulnerable household in coping with the constraints of the South African labor market, but it did not serve to reshape existing gender inequalities.

1. Introduction

Post-apartheid South Africa is characterized by a marked expansion of social grants provided to vulnerable groups, such as persons with disabilities (Disability Grant, DG), older persons (Old Age Pension, OAP), and children (Child Support Grant, CSG) in poor households. This policy, which is centered on increasing the coverage of unconditional and means-test cash transfers, was implemented under social and political pressure to overcome the highly inequitable inheritance of the previous social security system, which was strongly marked by racial discrimination, and to reduce the widespread poverty and inequalities (Burns et al., 2005; Schiel et al., 2014; Woolard and Leibbrandt, 2011; Woolard et al., 2011).

However, this shift toward increased social spending is constrained within the framework of a public deficit reduction strategy (Ajam and Aron, 2007; Pons-Vignon and Segatti, 2013).

Thus, the government has not adequately improved the spending on infrastructure nor the coverage and quality of health, education and other essential public services delivered to vulnerable population groups (Ajam and Aron, 2007; Budlender and Lund, 2011; Hassim, 2008; Pons-Vignon and Segatti, 2013; Zembe-Mkabile et al. 2015). Consistent with the implementation of orthodox macro-policy, post-apartheid South Africa has heightened economic liberalization, reduced the role of the state with regard to economic intervention, and strengthened the flexibility of the labor market through the increased use of temporary contracts, casual labor and piece-work (Pons-Vignon and Anseeuw, 2009).

In this context, a social policy characterized by relatively high spending on social grants, while the insurance component of the security system still provides only small benefits to a minority of prime-age adults, has significantly contributed to alleviating poverty (Agüero et al., 2007; Finn et al., 2014; Finn and Leibbrandt, 2016; van der Berg et al., 2008; Woolard and Klasen, 2005; Woolard and Leibbrandt, 2011) but has done little to address the unequal dynamics associated with the apartheid regime and the deep causes of chronic poverty (Ghosh, 2011; Hassim, 2006; Pons-Vignon and Segatti, 2013; Woolard and Leibbrand, 2011). In more detail, according to StatsSa (2017), in 2015, the proportion of the population living in poverty was 55.5 percent (30.4 million South Africans), whereas the number of persons living in extreme poverty (i.e., persons living below the 2015 food poverty line of R441 per person per month) was 13.8 million. In addition, in the post-apartheid period, inequality has slightly increased, as captured by the Gini coefficient based on income data (including social grants), which increased from 0.67 in 1993 to 0.69 in 2014 (World Bank, 2017)[1].

The well-established literature that looks at the drivers of inequality in South Africa shows that this disappointing result is explained by the fact that the equalizing effect of the expansion in social grants has been reversed by the disequalizing effect produced in the labor

[1]Note that, in the same year, the poorest 20 percent of the South African population consumed less than 3 percent of the total expenditure, whereas the wealthiest 20 percent consumed 65 percent (World Bank, 2017).

market (Agüero et al., 2007; Hundenborn et al., 2016; Schiel et al., 2014, among many others). Indeed, in 2015, the unemployment rate was 27.7 percent for women and 23.4 percent for men. According to the broad definition of unemployment, which includes non-searching unemployed[2], unemployment rises to 39.0 percent for women and 32.1 percent for men (StatSa, 2016). In addition, massive unemployment for both men and women is a structural feature of the South African labor market, especially in the African population group (Banerjee et al., 2008; Bhorat, 2004, 2012; Burger and von Fintel, 2014; Cichello et al., 2014). In 2015, the unemployment rate in this demographic group reached 31.1 percent for women (compared to 7.1 percent for white females) and 26.3 percent for men (6.5 percent for white men).

These figures not only highlight that the extensive unemployment and racial legacy are at the root of persistent poverty but also point to the differing conditions faced by women and men in the labor market. Women are increasingly working in paid employment (Banerjee et al., 2008, Casale and Posel, 2002), but they are overrepresented among low-wage workers and the self-employed in the informal sector (Casale and Posel, 2002), and differences in earned income and in the employment rates between men and women are large and persistent (Bhorat and Goga, 2013; Casale, 2004; Leibbrandt et al., 2005; Posel and Rogan, 2009)[3]. As stressed by Cook and Razavi (Cook and Razavi, 2012), a vast literature about women's work in the labor market in developing and emerging countries points to the fact that the narrowing of the gender gap in economic participation rates has not produced equality in pay and status and has been coupled neither with significant changes in the division of reproductive work in the domestic sphere nor with the expansion of public care services to reduce the burden of unpaid domestic work (Hassim, 2006; Oduro and Staveren, 2015).

[2]Non-searching unemployed (or discouraged workers) are those who would accept a job if offered but are not actively searching. According to a large body of literature, the broad definition of unemployment is the appropriate measure to consider since the non-searching unemployed represent a large proportion of the South African jobless (see Kingdon and Knight 2004, 2006).

[3]The labor force participation rate in 2015 was 52.1 percent for women and 65.1 percent for men. The employment rates in the same year were 37.7 percent for women and 49.9 percent for men (StatsSa, 2015).

These trends have been exacerbated in South Africa by the legacy of the apartheid policy of "labor reserve", which produced migration of African males to urban areas, intensifying women's responsibility for household reproduction and care in the subsistence-based rural economies (Cook and Razavi, 2012). Indeed, family disruption caused by the apartheid economy still shapes the pattern of African families. This is evident in the large number of female-headed households with children, in which adult women provide care for childbearing and other duties (Budlender and Lund, 2011; Casale and Posel, 2002; Cook and Razavi, 2012; Posel and Rogan, 2009). This pattern has also contributed to the "feminization of poverty" in South Africa (Casale, 2012; Posel and Rogan 2009), i.e., the widening of the gender gap with the risk of poverty.

Given the specific features of the South African context, to explore how the government's poverty reduction strategy has affected the labor market outcomes of vulnerable people is an important area of study. In this paper, we accomplish this task by focusing on the case of the Child Support Grant (CSG), which represents a broad package of social assistance in South Africa, reaching more than twelve million beneficiaries in 2016 (SASSA, 2017), and is one of the main instruments of the national social protection strategy for addressing poverty and inequality (Niño-Zarazúa et al., 2012). Since this policy has a strong gender dimension because it impacts the care burden, which is mainly carried by women, and the grant is overwhelmingly paid to women (Burns et al., 2005; Cook and Razavi, 2012; Goldblatt, 2005, 2014; Patel and Hochfeld, 2011), we adopt a gender perspective in our analysis and focus on the following research questions. Is the CSG a gender-neutral instrument of social policy, or does it affect the labor market outcomes of women and men in different manners? Does the CSG have any indirect effect that reinforces or alleviates existing gender inequalities in the labor market?

This paper contributes to the previous literature by providing an evaluation of the causal impact of the CSG on the labor supply of the adult recipients. Our aim is to assess whether

and to what extent the CSG has a heterogeneous effect by gender on the employment status and labor force participation of the parents of beneficiary children. Even if this sample represents only a subset of the whole population of adult recipients, our analysis can provide useful insights into the gendered impact of the grant on labor market outcomes.

The causal relationship between the grant and the adult labor supply is affected by a number of surrounding aspects in addition to gender, both at the individual and household levels, such as education, barriers to a job search due to adverse geographical location – especially for Africans – and high transport costs, other grants received by the household's members, the household composition, and generational aspects. Thus, we consider several sources of heterogeneity, related to relevant individual and household characteristics, which interact with the gender of the beneficiary parents, to more precisely identify the possible channels through which the CSG affects labor participation and employment status of the recipients. In more detail, we take into account heterogeneous effects related to education, rural/urban household location and other household income due to older persons in the household receiving the OAP. Heterogeneous effects by number of treated children and age of adult recipients are also considered.

We use the National Income Dynamics Study (NIDS), a nationally representative dataset covering 2008, 2010–2011, and 2012, and implement a fuzzy regression discontinuity design (RDD) that exploits the variation due to the extension in child age eligibility from January 1, 2010. This policy change created a discontinuous increase in the probability of being a CSG beneficiary for children between 14 and 17 years old born after January 1, 1994, and provides us with an identification structure for the analysis.

We estimate the effect of the CSG using an instrumental variable (IV) approach. In more detail, we run IV regressions to estimate the local average treatment effects (LATE) (Jacob et al., 2012; Lee, 2008; Lee and Lemieux, 2010), and to capture the heterogeneity of treatment across units of observations, we follow the approach proposed by Becker et al. (2013) to

estimate the heterogeneous local average treatment effects (HLATE). Several checks indicate that the results obtained through this procedure are robust.

The empirical analysis reveals great variability by gender in the effects of the CSG on the labor supply of the parents of the beneficiary children. We find a negative impact of the program on the probability of being employed (-9.7 percent), which is higher for men (-20.0 percent) than for women (-5.0 percent). This result, at first glance, could seem to be positive evidence in terms of gender equality. However, in the case of men, the decrease in the probability of working-age males being in the employment state is in large part offset by an increase in the probability of becoming searching or non-searching unemployed, whereas in the case of women, we find evidence that the negative impact on employment translates almost fully into an increase in the probability of being out of the labor force, i.e., being not economically active (NEA) after the treatment of the CSG.

To correctly interpret these findings, we must stress that the relative increase in the probability of exiting from the labor market for the parents of beneficiary children ranges between 3.6 and 7.5 percent in our different specifications of the estimated model and, considering the heterogeneity by gender, that no sensible difference emerges in the size of this effect between women and men. This result means that there is a disincentive effect on participation in the labor market for both women and men, which is noteworthy. However, by considering several potential sources of differential behavior in addition to gender, the whole picture that emerges is more complex. The whole analysis shows that the labor market exit involves mainly the most deprived workers, who have less options in the labor market. In addition, for neither women nor men do we observe perverse discouraging effects on labor market outcomes that would depend proportionally on the increase in the number of recipient children.

Overall, these findings suggest that the CSG did not affect in a remarkable manner the work motivations of the recipients by inducing a dependency attitude toward the grants.

Rather, the evidence seems to disclose the vulnerable households' strategy of coping with the precarious labor market conditions and the burden of poverty through an intra-household reallocation of paid and unpaid work, which is mainly determined by the gender, education, and age of the recipients. However, this evaluation, ultimately, shows that, regarding the ambitious achievement of reducing women's inequality, the CSG did not contribute to improving gender equality in the labor market.

2. Related literature

The CSG was introduced in 1998 to support vulnerable children and their households. The grant is an unconditional monthly transfer that is paid, for each child up to six, to their principal caregivers, who, in most cases, are mothers and other women in the households (Agüero et al., 2007; Patel et al., 2013)[4]. The "follow the child" principle of the grant's design was informed by the fluid living arrangements of many children in poor areas in South Africa (Gomersall, 2013), and in formal terms, it aimed at delinking care work from mothering (Hassim, 2008; Patel and Hotchfeld, 2011).

The recipients are qualified on the basis of a means test with an income threshold amounting to ten times the monthly grant per child if the recipient is a single caregiver and twenty times if she/he is married[5]. In addition, the program initially included children under the age of seven, and then, the eligible child age gradually increased. By 2010, eligibility underwent a sharp change: children born before January 1, 1994 were eligible up to age 14, whereas those born after that date gained eligibility up to age 18. (Agüero et al., 2010; Woolard et al., 2011).

A number of studies have evaluated the impact of the program along differing dimensions of

[4]The grant was fixed at a level of R100 per month for each beneficiary child in 1998 and rose over the years, reaching R320 per month for each child in 2014. From 2008 onward, the amount has been adjusted for inflation every year (Agüero et al., 2010; Woolard et al., 2011).

[5]Note that this measure considers the income of the primary caregiver plus that of her/his spouse, net of other social assistance grants (Woolard et al., 2011).

the wellbeing of the children and their families and generally found positive results[6]. Among others, Samson et al. (2008) and Agüero et al. (2010) showed that the CSG improved childhood nutrition, whereas Williams (2007) provided evidence that it reduced child hunger. Coetzee (2013) found positive effects on the health, education and wellbeing of children. Budlender and Woolard (2006) and Case et al. (2005) found statistically significant positive effects of the CSG on the school enrollment of children. Moreover, according to Cluver et al. (2013), the CSG reduced the likelihood of risky adolescent behavior. Eyal and Burns (2016) found that the receipt of the CSG lowered the probability of inter-generational transmission of depression to teens and adult children. Delany et al. (2008) found that beneficiary households mainly allocated the grant to expenditures for essential goods, such as food and clothing, and to meeting the costs of the children's education and care. d'Agostino et al. (2017) showed that the CSG proved to be effective in increasing beneficiary households' food expenditure, although it did not significantly change their dietary diversity.

The literature has also explored some potential behavioral effects of the CSG on the eligible population. For example, Makiwane et al. (2010), investigating whether the grant had perverse incentives for reproductive decision making, provided evidence that dismisses any link between the introduction of the CSG and teenage fertility rates. More limited attention has been devoted to the empirical analysis of the impact of the CSG on women's empowerment and bargaining power in the household decision and on the labor supply response of the recipient household's members. These two issues interact in a complex manner through the effects of the policy on work incentives, the pooling of the grant with other household income, and the labor allocation within the household (Bourguignon and Chiappori, 1992; Chiappori, 1992; Folbre, 1986). In more detail, the say that a woman has in household matters is determined by her direct access to economic resources, particularly earned income (Anderson and Eswaran, 2009; Basu, 2006). At the same time, the outcome in the labor market is

[6]For an extended review, see Gomersall (2013) and Woolard et al. (2011).

endogenously determined by the distribution of power within the household, which depends on economic, social and cultural factors (Basu, 2006). Thus, social grants affect, directly and indirectly, the links between women's access to economic resources, their employment opportunities outside the home and their autonomy. The overall effect is ambiguous from a theoretical point of view, and the direction of the impact is ultimately an empirical question (Alzúa et al., 2013; Novella et al., 2012).

In addition, recent feminist research has criticized the controversial manner in which women are incorporated into poverty alleviation policies based on cash transfers. This strand of the literature has contested the assertion that giving cash to women automatically means that they control its use and has highlighted that, instead, women serve as "conduits of policy" (Molyneux, 2006, 2016) in the sense that they are expected to efficiently translate the financial resources into improvements in the wellbeing of children and the family as a whole. According to these contributions, this approach to social policy dilutes the responsibility of the state for providing decent social and care services. As women are put in charge of household welfare, this framework perpetuates the male privilege of being absolved from any clearly defined role (Staab, 2010; Tabbush, 2010) and contributes to entrenching asymmetric gender norms, values and stereotypes (Branisa et al, 2014; Cook and Razavi, 2012; Folbre, 2009; Seguino, 2007). The experience of conditional cash transfers implemented in the Latin American context is at the core of these critiques (Bradshaw, 2008; Chant, 2008; Scarlato et al., 2016; Staab, 2010; Tabbush, 2010)[7]. However, the concerns about the risk that cash transfers may reinforce the traditional role of women as mothers, with primary responsibility for family care, without taking into account their particular needs and vulnerabilities can be easily extended to the case of unconditional cash transfers implemented in other developing contexts (Ghosh, 2011). In the South African case, for example, cash transfers are

[7]Conditional cash transfers, in most cases, provide extremely poor households with a cash subsidy to invest in children's education, health and nutrition. The program's design channels the benefits through mothers, who are in charge of complying with a number of conditionalities.

overwhelmingly paid to poor women who are overburdened by paid and unpaid duties and lack public service delivery to socialize the responsibilities for unpaid caregiving.

Indeed, Patel (2012), Patel and Hochfeld (2011) and Patel et al. (2013) built on this literature to provide an interesting piece of evidence regarding the impact of the CSG on gender relations and the empowerment of women in South Africa. Drawing from a 2010 survey of women receiving the CSG in Soweto, an urban area of South Africa, they explored whether the increased access to financial resources for women receiving the grant improved their bargaining power in intra-household decision making and how the benefits accrued for their children. These studies, which are based on descriptive data, demonstrated that money directed to women had a positive multiplier effect on their empowerment and the wellbeing of the beneficiary children in their care. Overall, these analyses support, on the one hand, the hypothesis that women, more than men, use their economic resources to improve the health, nutrition, and educational status of household members, particularly children (Duflo, 2003). On the other hand, they suggest that direct access to economic resources increases the bargaining power of women over the household's total income (Basu, 2006). However, the evidence also revealed that inequality in gender relations remained largely unchanged, and this indicates that social grants in South Africa, on their own, are limited as tools for social transformation and need to work in concert with other policies, such as programs to reduce the burden of care on women, in order to address the multiple deprivations that cause gender inequality.

Considering the effects of social grants on the labor supply of the adult recipients, a vast and general body of literature has demonstrated that they could potentially be either positive or negative. From a theoretical point of view, according to the standard economic model (Moffitt, 2002), the main effects of cash transfers on the labor supply of adults are the following: (i) an income effect, which increases the demand for leisure or time dedicated to household chores, relative to paid labor, and (ii) an incentive effect, which means that

adults are incentivized to reduce their labor supply or to give preference to informal jobs to continue being eligible for the program when the benefits are means-tested and the adult's work earnings are close to the income threshold (Alzúa et al., 2013; Asfaw et al. 2014; Leibbrandt et al., 2013; Novella et al., 2012, Perez Ribas and Veras Soares, 2011; Skoufias and Di Maro, 2008). In contrast, we may expect a positive effect on the labor supply when cash transfers contribute to relaxing liquidity constraints and to funding fixed costs related to self-employment or to a job search and household production (Cogan, 1981; Leibbrandt et al., 2013; Perez Ribas and Veras Soares, 2011).

These effects may obviously vary by geographical area, as credit constraints, lack of services and job-search costs are higher in remote rural communities (de Brauw et al., 215; Perez Ribas and Veras Soares, 2011). In addition, these effects may vary by gender. Taking into account more complex interactions in a household model setting, which rejects the unitary vision of the household, the potential impact of cash transfers on the adult's labor supply can be heterogeneous because it is also affected by the intra-household decision process for the allocation of resources and time, which depends on several factors, such as the norms and culture regarding gender roles, in addition to the distribution of the bargaining power within the household (Chiappori, 1992; Novella et al., 2012). From this perspective, gender issues are crucial, and the grant may have both positive and negative effects on adult participation in the labor market, depending on the rebalancing of the intra-household decision process (Del Carpio and Mancours, 2010; Novella et al., 2012). For example, cash transfers are expected to improve the female labor supply if they help reduce the burden of care, increasing the time available for women to devote to paid work (Alzúa et al., 2013). However, when cash transfers shift the bargaining power toward women by increasing their empowerment, the overall impact on participation in the labor market is ambiguous: it could be positive if women prefer to work in the labor market or negative if they prefer to spend more time on reproductive work at home (Novella, 2012; Perez Ribas and Veras Soares, 2011). Note that in this field of research, the bargaining power is mainly determined by the relative

level of education. Hence, following this literature, we should interpret a reduction in the maternal labor supply in response to receiving the grant as a result of women's preferences and improved empowerment only for well-educated women, who have good options in the labor market but choose to devote more time to family labor.

In the case of South Africa, there is robust evidence about the OAP, which is a large-scale and generous South African social grant, showing that pensions had mixed results on possible perverse labor market incentives (Ardington et al., 2009; Bertrand et al., 2003; Woolard and Klasen, 2005, among others). The OAP targets people who are generally out of the labor force, but pension income is usually pooled with other household income and could therefore affect the decisions of household members of working age (Williams, 2007). Thus, household composition and intra-household labor allocation are crucial factors in determining the effects of the OAP on the labor market. According to Bertrand et al. (2013), working age males who reside in households with members eligible for the pension tend to leave employment and live off the older pensioner who has the benefit. Woolard and Klasen (2005) suggested that lower labor force participation rates are due to the distortion of the household formation process, as those without work or means of support gravitate toward relatives who have some social assistance. However, counteracting effects are at work. Posel et al. (2006) found, in fact, an association between receiving the pension in a household and financing younger adults of the family, specifically women, who have migrated either to work or to look for work. Similarly, Ardington et al. (2007) provided evidence consistent with the hypothesis that pensions increase employment among prime-aged members of households in which older persons reside. This positive impact may be due to the fact that the increase in household resources is used to support migrants until they become self-sufficient. In addition, cohabitation with pensioners who can care for small children in the household allows prime-aged adults, women in particular, to look for work elsewhere.

The DG is another source of benefits that provides an important safety net for the working

age population. For this program, whose beneficiaries have rapidly grown since 2002 because of looser disability screening, Mitra (2009) provided initial evidence that reduced stringency in DG screening in treatment provinces might not have affected the labor market behavior of older females but might have led to a reduction in the participation of older males in the broad labor force. However, that paper does not provide any explanation of the differential outcome for women and men.

Finally, considering the CSG, there are good reasons to believe that this program can significantly affect household decision making, including labor supply. First, most beneficiaries live in rural areas and face significant barriers that block their access to multiple markets, such as credit and labor markets (Kingdon and Knight, 2004, 2006). Hence, the CSG, which is provided in a regular fashion, may help households overcome these obstacles (Surender et al., 2010; Williams, 2007). On the other hand, in 2014, the CSG total amount per caregiver ranged from R320 for caregivers with one eligible child to R1,920 for caregivers with six children. Given that in the same year, the median monthly earnings were R3,033 (R2,800 for the subgroup of Africans who are more likely to be poor and eligible for the program) (StatSa, 2015), the grant represents a significant income source for beneficiary families[8].

However, the evidence regarding the labor supply responses of adult recipients of the CSG is scant. Overall, existing empirical analyses have found positive results. Samson et al. (2004) used national surveys to estimate the impact of South Africa 's social security system – the Old Age Pension (OAP), Disability Grant (DG), and CSG – on measured official labor force participation and employment rates in the period of 2000–2002 and found that people in households receiving social grants increased their labor force participation and employment rates. This statistical analysis cannot prove causation, but the authors argued that this

[8]According to van der Berg et al. (2010), the CSG income contributes at least 20 percent of household income in the bottom two deciles and approximately 10 percent in the next two deciles. These figures confirm that the grant has the potential to affect the adult work incentives of participants, as previous findings in similar contexts demonstrated (Skoufias and Di Maro, 2008).

evidence is consistent with the hypothesis that social grants provide potential labor market participants with the resources necessary to invest in job search. Using data from the General Household Surveys (GHS) and the Labor Force Surveys (LFS) for the period of 2002–2005, Williams (2007) estimated cross-section regressions to assess the impact of the age of a child, which proxies the probability of receiving the CSG, on the parents' labor force outcomes. He found that the program strongly increased the broad labor force participation of grant-receiving women, whereas the analysis revealed small, mixed effects on employment and participation rates of their husbands. These results are explained by the fact that the grant helped pay for childcare and job-search costs, thus allowing mothers to enter the workplace.

Unlike these analyses, we have run a direct estimate of the causal effects of the CSG on the labor market outcomes of the parents of beneficiary children. Our main contribution to the existing literature is to provide a causal evaluation of the impact of the program on the labor supply of this important subset of adult recipients at the national level. In addition, to take into account the differential impact of the CSG on women and men, our analysis considers heterogeneity by gender. Finally, the evaluation tries to indirectly infer the effects of the transmission channels of the impact, such as the potential effects of the reallocation of labor at the household level, by assessing other sources of variability that capture the characteristics of the treated women and men and their households.

3. Data and empirical framework

3.1. Data

The empirical analysis is based on the dataset provided by the National Income Dynamic Study (NIDS), which was implemented by the South African Labor and Development Research Unit (SALDRU) of the University of Cape Town. The NIDS is available for the waves 2008, 2010–2011, and 2012 and allows a face-to-face longitudinal survey of households resident in South Africa. Its aim was to follow a sample of household members and register

changes in household compositions and migrations and several dimensions of wellbeing (e.g., incomes, expenditures, assets, access to social services, education, health, and employment). The dataset also includes information on the beneficiary households of the social grants provided by the government.

From the dataset, we extracted relevant information for children aged between 0 and 17 years, i.e., children in the birth cohorts from 1990 to 2009, and for the corresponding households. Our evaluation is focused on the CSG's impact on the labor supply of the parents of the beneficiary children in our sample; thus, we have extrapolated information about the parents in the working age population (from 15 to 64 years old). We restrict the sample and consider those parents of beneficiary children who are the head of the household or their spouse or cohabitant[9]. When the information about the parents is absent, we replace it using the information about the caregiver and his or her spouse/cohabitant. Using a sample including only heads of households or spouses of heads, we select independent parents who have their own sources of support and are supposed to be the principal decision-makers in the household. In this manner, we reduce the potential bias and complex effects linked to household composition that could be at work in the context of extended families in South Africa (see Section 2)[10]. This restriction does not exclude the possibility that in the households of the sample, other members are older persons and receive the OAP. We also keep this effect under control, as will be discussed later.

We further restrict the sample and consider only individuals who did not change their location between waves in order to have a stable number of observations in the sample. We are aware that individuals who move in between waves are a non-random sample of the labor force

[9]This restriction does not imply that we consider only nuclear families. Rather, we have households of different sizes, and we do use the corresponding information in the analysis; however, we evaluate the impact of the CSG on the labor market behavior of only the head of the household and her/his spouse or cohabitant.

[10]For example, we could have unemployed persons with children who attach themselves to another household to seek support (Woolard and Klasen, 2005). In this case, the caregiver of the child receiving the grant would not correspond to the head of the household.

participants, as they have desirable unobservable characteristics, have higher probabilities of finding employment, and can afford the fixed costs related to childbearing and job searches (Casale, 2002, 2004; Posel et al., 2006). This means that our results may provide an overestimate of the potential negative effects of the grant on labor market outcomes because they do not capture the potential effect of the grant via the financing of migration of a household's member with better human capital or innate ability. To also include in our analysis the effect of migrations and remittances would not have been a trivial task, and we leave this issue to further research.

Finally, the sample includes only African, colored and Asian individuals. These demographic groups represent almost all of the grant recipients of the treatment sample. For this reason, we excluded white individuals from the control group to guarantee comparability between the treated and control samples. Ultimately, the sample at the base of the panel analysis is composed of 12,925 individuals, for a total number of 23,395 observations.

We extracted information regarding several variables related to the labor market from the dataset and classified working-age individuals into four states: employed, searching unemployed, non-searching unemployed and NEA. These states are the outcome variables of the impact evaluation. The distinction between searching unemployed, non-searching unemployed, and NEA is useful for our empirical analysis because it allows us to better highlight whether and to what extent the CSG can be useful in financing the fixed costs of a job search[11].

The upper part of Table **??** reports the probability of being in each of these four labor market states when we distinguish between the parents with children receiving the CSG (treated) and not receiving it (control). This table indicates that the probability of being employed is much higher in the control sample and that the probability of being NEA is higher in

[11]The distinction between searching and non-searching unemployed in the South African labor market is blurred (Kingdon and Knight, 2004, 2006), but in this case, it is useful to distinguish between the two states to better stress the potential effect of the CSG via the financing of the fixed costs of a job search.

Table 1: Descriptive statistics

Outcome variables		Treated	Control		
Employed		0.378	0.546		
Searching		0.123	0.085		
Non-searching		0.052	0.044		
NEA		0.425	0.298		
Control variables		Treated	Control	T–test	p–value
Gender	Male	0.257	0.312		
	Female	0.743	0.688	10.10	0.000
Number of children	One child	0.353	0.316		
	Two children	0.224	0.280	-10.60	0.000
	Three children	0.251	0.248	0.42	0.676
	Four children	0.172	0.156	3.73	0.000
	More than four children	0.254	0.182	14.36	0.000
Household size	1-4	0.239	0.306		
	5-9	0.620	0.602	3.12	0.002
	10-14	0.124	0.084	10.52	0.000
	15+	0.017	0.008	6.20	0.000
Head of the household		0.309	0.363	-9.39	0.000
OAP		0.184	0.119	14.77	0.000
Demographic group	African	0.867	0.753		
	Colored & Asian	0.133	0.247	-24.94	0.000
Marital status	Unmarried	0.241	0.163		
	Married	0.634	0.737	-18.34	0.000
	Widowed or Divorced	0.125	0.100	6.45	0.000
Education	No schooling	0.202	0.133		
	Primary degree	0.267	0.190	15.08	0.000
	Secondary degree	0.508	0.555	-7.77	0.000
	Bachelor degree	0.023	0.122	-34.50	0.000
Geographical location	Rural	0.506	0,336		
	Farm	0.112	0.117	-1.41	0.158
	Urban	0.382	0.547	-27.73	0.000
Age		44.211	43.651	4.50	0.000
Age square		2067.6	2001	6.14	0.000

the treatment sample. Furthermore, we find that there is a higher probability in parents of the treatment group being searching unemployed compared to the control group, but this difference is not found when the non-searching unemployed are considered.

From the dataset, we collected information about several control variables, reported in the bottom part of Table **??**. The list of covariates includes individual characteristics of the parents of recipient children (gender, age, education, marital status, demographic group,

and geographical location) in addition to household characteristics (number of children, household size, and the probability of cohabitation with one or more older persons receiving the OAP social grant). The list of covariates includes a dummy variable indicating when the adult individual is the head of the household or the spouse/cohabitant of the head. District and province fixed effects for where individuals live are also included in the list of covariates in addition to the birth cohort of the individuals in the sample. The information about these two variables is not presented in the table.

In the last two columns of the table (bottom part), we present the t-test on the balance of the covariates between the treatment and control groups. This test shows that in almost all of the cases, there is a statistically significant difference between the values of the chosen covariates for the treatment and control groups. This imbalance of the covariates may represent a potential threat for the goodness of the analysis. We will address this problem in the next subsection.

3.2. Empirical framework

The CSG benefits are provided to eligible beneficiaries according to a means test and child age[12]. From January 1, 2010, the age eligibility was extended such that children born after January 1, 1994, were eligible until their eighteenth birthday, whereas those born before that date lost eligibility at age 14. The discontinuity in the age eligibility criterion provides a clear-cut natural experiment for evaluating the causal impact of the program.

The analysis adopt the heterogeneous local average treatment (HLATE) estimation procedure based on the regression discontinuity design (RDD) approach and a local treatment effect (LATE) estimator. RDD allows one to take into account both observed and unobserved heterogeneity in the estimation of the treatment effect (the impact of the program) when there is an eligibility rule for the treatment based on an observable criterion. Let us consider a

[12]For a detailed discussion of the progressive changes in these criteria, see d'Agostino et al. (2017). See also Appendix A for a description of the outline of the identification strategy.

standard RDD, where CSG is a binary treatment indicator (i.e., it captures people treated by the CSG), BC is an assignment variable (in our analysis, the birth cohort of the children), and c is the threshold for BC at which the probability of treatment changes discontinuously (January 1, 1994). The principle underlying this strategy is that observations just below and above the cutoff (January 1, 1994) are likely to be very similar to each other with respect to observed and unobserved characteristics; hence, the mean difference in the values of the outcomes can be attributed to the treatment effect (average effect, ATE) [13].

Since in the present case, the eligibility rules are not followed imperatively, we need to apply a procedure that allows for randomness in the treatment assignment. Thus, we implement a fuzzy RDD model [14]. In a fuzzy RDD, the treatment effect is obtained by dividing the increase in the relation between Y (the outcome variable) and BC at c by the difference between the probabilities that a child is treated before or after the cutoff. In addition, in this approach, the discontinuity is used as an instrumental variable (IV) for the treatment status[15]. In the present case, we use the treatment status related the the eligible children in the age range of 0-17 years old, and we link it to the the behavior of the corresponding parents in the working age population (from 15 to 64 years old). In this manner, we obtain the instrument for the treatment indicator CSG. Hence, defining as y_{it} the probability of being in a particular labor market state, we can write the following:

$$y_{it} = \alpha_0 + \alpha_1 CSG_{it} + \alpha_2 gender_{it} + \alpha_3 (CSG \times gender)_{it} + W'_{it}\beta + F'_{it}\delta + \epsilon_{it} \qquad (1)$$

where W_{it} is a matrix of the relevant characteristics of each individual i, including the adult

[13] We consider all the eligible children in the age range of 0-17 years old because the results of the RDD are constant in this age range (d'Agostino et al., 2017). Hence, it is preferable to use all the information available without constraining the observations in the neighborhood of the cutoff through an arbitrary bandwidth.

[14] d'Agostino et al. (2017) confirm the fuzzy nature of the RDD, showing that at the cutoff (January 1, 1994), only 5.9 percent of the eligible households (10.5 percent when considering the time 2008-2011) participated in the CSG.

[15] The Wald formulation of the treatment effect allows us to estimate the fuzzy RDD in a parametric IV framework when the assumptions of monotonicity and excludability related to the assignment variable in the neighborhood of the cutoff are satisfied (Hahn et al., 2001).

cohort effects and the characteristics of her/his household; F is the matrix including the district and provincial fixed effects and their interactions with the time trend, to take into account labor market heterogeneous fixed effects at the local level; and ϵ_{it} is the error term.

Equation **??** explicitly considers the heterogeneous effects by gender, which are taken into account by the interaction between the treatment variable (CSG_{it}) and a dummy variable that takes the value 1 when the individual is female ($gender_{it}$). This means that when the heterogeneity is not considered, we estimate equation 1 by excluding $(CSG \times gender)_{it}$ and obtain the effect of the CSG on the labor market outcome for the whole treated sample. When we introduce the interaction term, as in equation **??**, the treatment effect is not only local in the neighborhood of the cutoff (LATE) but also heterogeneous with respect to the gender of the individual (HLATE) (Becker et al., 2013). The LATE for male individuals is obtained from $\alpha_1 + \alpha_3 * (gender = 0) = \alpha_1$, whereas the LATE for female individuals is obtained from $\alpha_1 + \alpha_3 * (gender = 1) = \alpha_1 + \alpha_3$. This means that α_3 measures to what extent being a woman changes the effect of the program on the outcome variable, with respect to men. In the next section, we provide the estimations of equation **??**, and we compare them with the results obtained by introducing Chamberlain's control for individual fixed effects into the equation (Chamberlain, 1980). We consider this control to account for unmeasured effects due to the self-selection of the recipients in the labor market that are not accounted for by the district and province fixed effects[16].

Note that to correctly identify the average treatment effect, the usual assumption of continuity of the counterfactual outcomes at the cutoff is not enough. We need to impose two further requirements: i) the continuity of the interaction variable at the cutoff and ii) the randomness of the interaction variable, conditional on the assignment variable.

In addition, to run an unbiased estimate of equation **??**, two issues must be addressed: the

[16]The introduction of this control for unobservable individual fixed effects allows us to consistently estimate equation **??** when we have only few observations for the same individual and these observations are not independently distributed.

possible multiple treatment effect, and the matching between treatment and control groups. Considering the first issue, we need to take into account that each adult may have more than one treated child, i.e., more than one grant, and up to six[17]. Thus, we account for six separate subsamples of adult individuals corresponding to the different numbers of treated children and compare each treatment subsample with the control group. To address this multiple treatment effect, we use the procedure originally proposed by Wooldridge (2002), which consists of estimating six separate probit models for each treatment group, controlling for the assignment variable (BC) and the matrix of individual and household relevant characteristics (W_{it}). These auxiliary regressions are as follows:

$$\hat{P}^{j}_{i,t} = \gamma_0 + \gamma_1 BC_{it} + W'_{it}\beta + \omega_{it} \tag{2}$$

where $\hat{P}^{j}_{i,t}$ is the predicted probability estimated from the probit model, BC_{it} is the assignment variable that captures the policy change, and ω_{it} is the error term. The fitted probabilities estimated from equation 2 can be directly used to construct an instrument that jointly takes into account the probability of being treated by the CSG and the number of treated children (Becker et al., 2013; Wooldridge, 2002).

The second concern for correctly estimating equation **??** is the balance of the treatment and control groups. As shown in the previous section, there are significant differences in terms of observable characteristics between the treatment and control samples, and this imbalance may bias the estimated results. To account for this issue, we ran a nearest neighbor matching estimation, comparing the treatment and the control groups with respect to their relevant characteristics, and then, we used the estimated weights in equation **??**. This procedure allows us to reduce the relevance of observations presenting sharp differences in their characteristics, at the individual and household level, in the treatment and control

[17]The percentages of adults for each class of treated children are as follows: i) 28 percent adults with one child, ii) 33 percent with two children, (iii) 20 percent with three children, (iv) 10 percent with four children, (v) 5.7 percent with five children, and (vi) 2.8 percent with six children.

groups and to obtain well-balanced samples for comparison.

The next step of the analysis is to extend the structure of equation **??** to include other factors of heterogeneity, in addition to gender, that may affect the decision of women and men to participate in the labor market after receiving the CSG. As shown by a large body of literature (Burger and von Fintel, 2014; Fourie and Leibbrandt, 2012; Kingdon and Knight, 2006; Posel et al., 2006; Posel et al., 2014, Yu, 2013a, 2013b, among many others), education influences the benefits and costs of participating in the labor market, and thus, we may expect different behavioral responses to the CSG for more-educated and less-educated women or men. In more detail, education (matriculation, in particular) encourages labor force participation and job search and increases employment prospects (Fourie and Leibbrandt, 2012)[18] A similar argument applies when considering the urban/rural dichotomy and families receiving only the CSG vs. those receiving both the CSG and the OAP (see Section 2)[19].

We introduce these covariates as sources of heterogeneity into equation 1. For example, when considering heterogeneity in educational level, we introduce into equation 1 a new interaction term that jointly accounts for the heterogeneity in gender and in education $(CSG \times gender \times H\_edu)_{it}$. The equation is now

$$y_{it} = \alpha_0 + \alpha_1 CSG_{it} + \alpha_2 gender_{it} + \alpha_3 (CSG \times gender)_{it} + \alpha_4 H\_edu_{it} + \alpha_5 (CSG \times H\_edu)_{it} + \alpha_6 (gender \times H\_edu)_{it} + \alpha_7 (CSG \times gender \times H\_edu)_{it} + W'_{it}\beta + F'_{it}\delta + \epsilon_{it} \tag{3}$$

We use the same structure to account for the urban/rural dichotomy and to distinguish heterogeneous effects due to the joint receipt of the CSG and OAP grants in the same

[18]We distinguish two educational levels: the first group (less educated), with no education or primary education degree, and the second one (more educated), with secondary education degree (matriculation) or higher.

[19]Our sample includes adults in the working age range, but we also collected relevant information about the other members of their households. Thus, we can control for other members of the household receiving the OAP.

household.

Introducing an ordered interaction variable into equation **??**, we can also identify the different effects of the CSG on the labor market by the number of treated children for each recipient and the age of the adult recipient. The first interaction term is used to take into account the increasing burden of care and increasing need of earned income to support the family in more extended households. The second interaction term instead accounts for the improved levels of education that younger generations had accumulated in the context of the new, anti-discriminatory policy in post-apartheid South Africa (Burger and von Fintel, 2014), the differing time of entering the labor market, and potential changes in the behavior of adults ascribed to becoming closer to the eligible age for the OAP grant.

Finally, the estimated probabilities linked to these different sources of heterogeneity are used to calculate the marginal effects, which directly assess how the probabilities of participating in the labor market vary between treated and non-treated individuals, for each covariate. For example, we can obtain the marginal effect that measures the percentage point difference between treated and control individuals in the probability of participating in the labor market for more- and less-educated women and men. This procedure allows us to reduce unobserved residual heterogeneity and to disentangle the individual and household characteristics of the female and male recipients that explain, apart from gender, the difference in the impact of the CSG on the the probabilities of being employed, of being searching or non-searching unemployed, and of being NEA. In other words, this analysis sheds light on the possible transmission channels that mediate the impact of the CSG on the labor market outcomes of female and male recipients.

4. Results

4.1. Preliminary analysis

Before discussing the main results, we present a preliminary analysis that provides some evidence about the goodness of the identification strategy. In line with the empirical framework, we address two issues: the potential multiple treatment effect and the balance of the treatment and control samples.

The first issue is related to the potential multiple treatment of the adults because more than one child and up to six children per household may receive the CSG. Following the empirical framework, in the first part of Table **??**, we present a probit model estimating the link between the assignment variable and the treatment indicator variable for each of the six subsamples. As a remark, the table does not include the district and provincial fixed effects, but it does include the adult birth cohort effects. The first part of Table **??** reveals two important results. First, there is a positive and statistically significant probability (at the < 1 percent significance level) of being treated by the CSG across the different subsamples. Second, we do not find any statistically significant differences of the estimated parameters between the subsamples. These two results prove the accuracy of the RDD since they demonstrate that we do not find statistically significant differences between different subsamples in the probability of being treated by the CSG. In turn, this result indicates that the relation between the assignment variable and the treatment indicator is sufficiently smooth to correctly identify the LATE.

At this point of the analysis, we have to address the requirements for a correct identification of the average treatment effect (Becker, 2013) and to check for the continuity and smoothness of the interaction variable. Thus, we replicated the previous analysis, and we ran six different probit models that used, as outcome variable, the dummy variable related to the gender of the adult individuals. If the continuity assumption holds, i.e., there is no discontinuity at the cutoff when we consider the interaction variable, we would expect to find non-statistically

significant parameters. The second part of Table **??** reports the results of the test and reveals that the requirements hold when we consider the different number of treated children for each adult in the six probit models. As the assumptions are valid for each subsample, they must also be valid for the entire treatment sample.

Table 2: Probit model

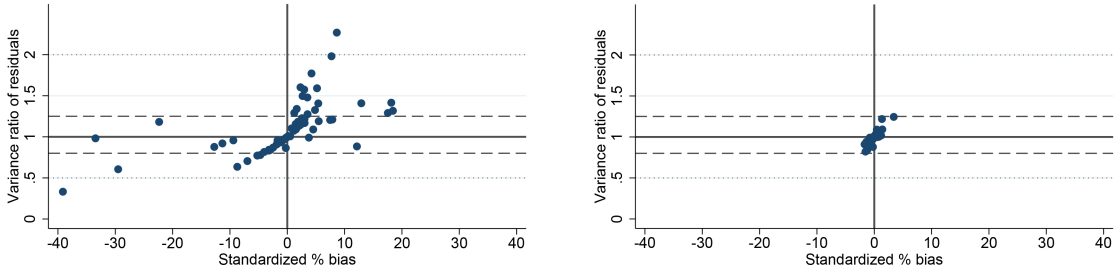
	1 child		2 children		3 children		4 children		5 children		6 children	
A) Probability of receiving CSG												
Children birth cohort	0.568	***	0.581	***	0.631	***	0.559	***	0.491	***	0.390	***
	(0.022)		(0.018)		(0.021)		(0.028)		(0.038)		(0.058)	
No. of observations	11,768		12,995		12,327		9,604		5,237		4,197	
B) Falsification test: continuity of the gender variable												
Children birth cohort	-0.026		-0.010		-0.014		-0.030		-0.012		-0.018	
	(0.018)		(0.018)		(0.019)		(0.021)		(0.022)		(0.024)	
No. of observations	11,751		12,995		12,327		9,604		5,237		4,197	

Notes: The estimates are based on equation 2 and include all the variables described in Table 1, in addition to the adult birth cohort effects. Clustered robust standard errors are reported in brackets. Asterisks: p-value levels (* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$).

Considering the second issue, we apply the nearest neighbor method to the treatment and control samples. Figure **??** has two scatterplots that show the standardized bias and the variance ratio of the residuals, before and after the nearest neighbor matching estimation. These graphs include all the variables described in Table 1, in addition to the adult birth cohort effects. As shown in the first panel of the graph, many covariates have values outside the significant range (indicated by the dashed lines). This may create biased estimated parameters and may increase the variance of the residuals. In contrast, the figure shows that after the matching, the samples are well balanced across the relevant household and individual characteristics.

4.2. Heterogeneity by gender

Proceeding with the analysis, Table **??** summarizes the main findings and shows the results of the instrumental variable estimation (IV). The table also reports the instrumental variable



(a) Unmatched (b) Matched

Figure 1: Balance test on selected covariates

Notes: The two scatterplots show the standardized bias and the variance ratio of the residuals, before and after the nearest neighbor matching estimation. The graphs include all the variables described in Table 1, along with the adult birth cohort effects.

specification including the Chamberlain control for fixed effects (IV-FE) to check for potential individual effects, such as innate characteristics, that are not captured by our covariates. The table is organized horizontally in two blocks and vertically in eight columns. The two blocks refer to a second-order polynomial specification[20] of equation 1 and report the estimates of the LATE and HLATE that include the gender interaction variable. In more detail, by introducing the interaction term $CSG \times gender$, we test the hypothesis that the impact of the CSG is different for women and men. The interaction term captures the gender effect of the program on the outcome variables for the treated individuals, and it can be interpreted as the heterogeneous effect of the CSG on women with respect to men.

In all the blocks, we test for weak instruments[21] and report first-stage F statistics (Cragg and Donald, 1993) (CD F–test) and Wald statistics (Kleibergen and Paap, 2006) (KP F–test)[22]. We mark CD F–test and KP F-test statistics with a star when the p-value corresponding to a reduction of the size and bias of the IV is greater than 10 percent. Following Bazzi

[20]According to Gelman and Imbens (2014), high-order polynomial regressions in the RDD can be misleading because they provide results that are sensitive to the order of the polynomial. Furthermore, global goodness-of-fit measures are not suitable for optimally choosing the polynomial order since they are not closely related to the research objective of causal inference. Thus, we use a second-order polynomial both in the first and second stages of the analysis.

[21]Weak identification of the instruments arises when the excluded instruments are weakly correlated with the endogenous regressors. In such a case, some estimators may perform poorly, but other estimators may be robust to weak instruments. Thus, we test for the goodness of our estimators.

[22]This second test is a generalization of the Cragg and Donald test for non-independently and non-identically distributed errors.

Table 3: Estimation results

	Employed				Searching				Non-searching				NEA			
	IV		IV-FE		IV		IV-FE		IV		IV-FE		IV		IV-FE	
A) Local Average Treatment Effect																
CSG	-0.097	***	-0.095	***	0.044	***	0.016		0.013	*	0.010		0.036	**	0.075	***
	(0.016)		(0.025)		(0.011)		(0.017)		(0.008)		(0.012)		(0.015)		(0.025)	
CD F–test	23204.741	⋆			23204.741	⋆			23204.741	⋆			23204.741	⋆		
KP F –est	10853.437	⋆			10853.437	⋆			10853.437	⋆			10853.437	⋆		
KP LM–test	1821.947	***			1821.947	***			1821.947	***			1821.947	***		
Adj. R^2			0.146				0.083				0.043				0.178	
N. obs	23,355		23,355		23,355		23,355		23,355		23,355		23,355		23,355	
B) Heterogeneous Local Average Treatment Effect by gender																
CSG	-0.201	***	-0.200	***	0.106	***	0.074	***	0.044	***	0.039	***	0.046	*	0.092	***
	(0.029)		(0.035)		(0.020)		(0.024)		(0.011)		(0.015)		(0.027)		(0.032)	
CSG X gender	0.150	***	0.133	***	-0.088	***	-0.076	***	-0.044	***	-0.038	***	-0.016		-0.018	
	(0.036)		(0.032)		(0.024)		(0.022)		(0.015)		(0.014)		(0.034)		(0.030)	
gender	-0.376	***	-0.342	***	0.072	***	0.053	***	0.062	***	0.049	***	0.247	***	0.242	***
	(0.026)		(0.020)		(0.017)		(0.012)		(0.011)		(0.009)		(0.024)		(0.018)	
CD F–test	7,349.855	⋆			7,349.855	⋆			7,349.855	⋆			7,349.855	⋆		
KP F–test	2,134.159	⋆			2,134.159	⋆			2,134.159	⋆			2,134.159	⋆		
KP LM–test	1,295.948	***			1,295.948	***			1,295.948	***			1,295.948	***		
Adj. R^2			0.192				0.085				0.045				0.213	
N. obs	23,355		23,355		23,355		23,355		23,355		23,355		23,355		23,355	

Notes: Robust and clustered standard errors are reported in brackets. Asterisks: p-value levels (* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$). In all the blocks, we test for weak instruments and present first-stage F statistics (Cragg and Donald, 1993) (CD F–test) and Wald statistics (Kleibergen and Paap, 2006) (KP F–test). We also present an underidentification test based on the Kleibergen-Paap LM test (KP LM–test). All the specifications include the covariates reported in Table 1, district and provincial fixed effects and interaction terms between fixed affects and the time trend.

and Clemens (2013), in this case, we can conclude that the set of instruments is not weak. We also report the results of an underidentification test based on the Kleibergen-Paap LM test (KP LM–test). All the specifications include the covariates reported in Table 1, the district and provincial fixed effects and the interaction between fixed effects and the time trend. The reported error terms are robust and clustered at the household level to account for the violation of the i.i.d hypothesis in the data.

The eight columns present the results for the four labor markets' outcome variables. The first two columns of Table **??** present the estimated results when the probability of being employed is considered. The first column of the upper block reveals that when we do not consider heterogeneity by gender, the CSG produces a negative variation of approximately 9.7 percent in the probability of being employed (9.5 percent in the IV-FE framework), which is significant at the less than 1 percent level . No statistically significant differences are found when we compare the results from the IV and the IV-FE.

More interesting results emerge from the second block of Table **??**, where the heterogeneity due to gender is considered. The table shows that the interaction term (CSG X $gender$) is always positive and statistically significant. This result means that that the CSG's negative impact on the probability of being employed is smaller for women than for men. Moreover, the gender dimension of the effect on the probability of being employed is strong, as for the treated women, the decrease in the probability of being employed ascribed to the exposure to the CSG is approximately 5 percent ($-0.201 + 0.150 * gender = 1$), whereas for men, we find a decrease of 20 percent ($-0.201 + 0.150 * gender = 0$). Similar to the previous cases, no statistically significant differences are found when we compare the results from the IV and the IV-FE.

We now consider how the CSG affects the probability of being in the other three labor market states, i.e., the probability of being searching or non-searching unemployed and of being NEA. Our interest is to assess whether the reduction in the probability of being employed is coupled

with an increase in the probability of being unemployed (searching or discouraged) or with an increase in the probability of being NEA. In the first case, we can speculate that even if some individuals, after receiving the CSG, leave their job, on the whole, the program encourages the treated individuals to remain in the labor force and become active or passive searchers of job opportunities suitable for their expectations. Thus, one possible interpretation of this result is that the CSG relaxes the liquidity constraints for the most deprived persons and increases their probability of engaging in a job search or at least allows them to passively remain in the labor force. In contrast, in the second case, the CSG incentivizes individuals to exit from the labor market. However, in both cases, we must remember that our analysis excludes migration of a household's members, and thus, it does not pick up the potential effects related to individuals who are better equipped for migrating to other geographical areas. Thus, our analysis provides an overestimate of the negative impact of the CSG on the labor market outcomes of the treated population.

Generally speaking, considering the searching and non-searching unemployed, we see that the heterogeneity by gender (second block of the table) is still relevant because the estimated parameters are more statistically significant compared to estimates that exclude the gender effect. Again, the estimates indicate that there are no significant differences between the IV and the IV-FE. In more detail, we find that there is an increase in the probability of becoming searching unemployed of approximately 1.2 percent when the female population is accounted for, whereas the same estimate for men is approximately 10 percent. We find a similar impact when we consider the change in the probability of being non-searching unemployed. In this case, we find an increase in the probability of approximately 4.4 percent for men, whereas the change is equal to zero when we consider women.

In contrast, when we analyze the impact on the probability of being NEA, we find that exposure to the CSG produces an increase in this probability, which ranges between 3.6

percent (IV) and 7.5 percent (IV-FE), with no significant heterogeneous effect by gender[23]. Note that in this case, the IV and the IV-FE reveal statistically significant differences in the estimated probabilities; thus, individual fixed effects are an important explanation of labor market exit. This result may be explained by the hypothesis that people exiting from the labor market have some unobserved individual characteristics that drive their bad performance by reducing the benefits and increasing the expected costs from participation (Burns et al., 2010). These people are supposed to be the most deprived, in terms of human capital, working-age individuals, with the least-desirable characteristics and the worst chances of obtaining a job when participating in the labor force.

In summary, when we account for the male population, we find a mixed impact: on the one hand, the CSG produces a strong negative impact on the employment probability, but on the other hand, the CSG seems to relax their liquidity constraints, increasing the probability of actively engaging in a job search or at least remaining in the labor market as passive job-seekers. We also find a significant negative effect on the labor force participation that is supposed to involve the individuals in the most precarious condition in the labor market. In contrast, when the female population is accounted for, the reduction in the probability of being employed is less than that for men, but their probability of participating in the labor force also decreases by almost the same amount. Again, the significant difference between the IV and IV-FE estimations suggests that this result is driven by the exit of the women with some characteristics that put them in a weak position in the labor market.

Looking at these results together, we speculate that they confirm the hypothesis that the grant supports the changing living arrangements of a household's members in vulnerable and extended families that have to cope with poverty and the weak conditions of the South African labor market (Burns et al., 2005; Leibbrandts et al., 2013). The grant seems to

[23]Since the estimated parameters in block B of the table are in the same confidence interval as those in block A, we can assess that there is no statistical difference between them. Hence, the heterogeneity in this case does not modify the results.

help the males who have better chances of finding jobs suitable for their expectations in reallocating their labor or searching for job opportunities. Females are less affected by the CSG. Most of them do not leave the employment state, but we must stress that when they do, they exit altogether from the labor market.

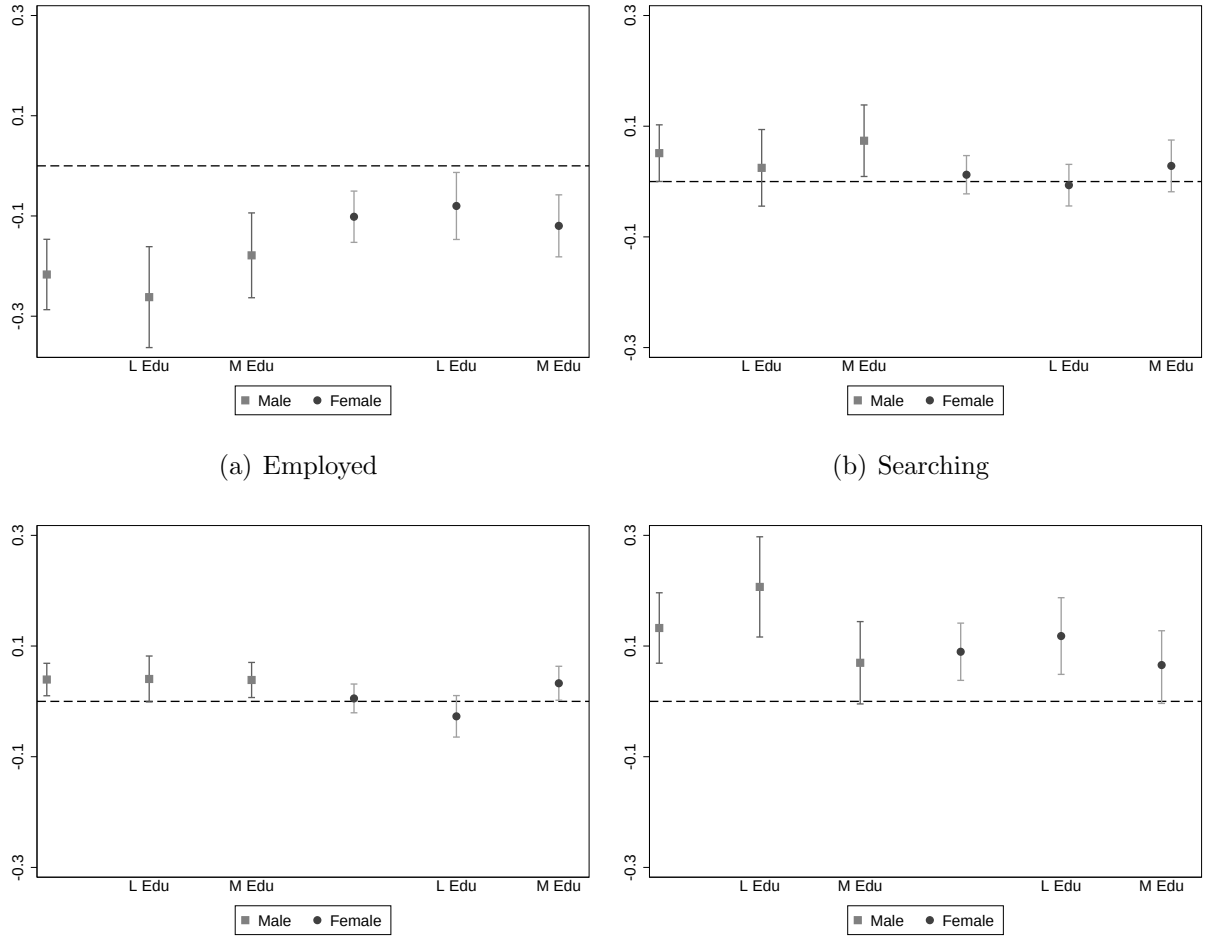
We can interpret this result in light of the literature about the distribution of bargaining power in most South African families (see Section 2). The evidence seems to suggest that men are able to capture a larger share of the pooled income when the household receives a grant and have the option to leave the market or search for better job opportunities. In contrast, women have less control over the income shared within the household, bear a higher burden of care and face worse chances than men in finding a job. Some women (the ones in the most precarious conditions) are thus induced to specialize in unpaid work when the family receives one or more grants. Following this perspective, the negative outcome for the participation of women in the labor market is not due to the fact that the CSG changes their tastes and attitude toward work but could be ascribed to their stringent constraints and weak position within the household and in the labor market. However, we cannot exclude that the grant increases the bargaining power of women in the household and that this effect facilitates some of them in investing their time in child care and domestic reproduction activities, with positive effects on the wellbeing of both women and children.

The lack of data about bargaining power and wellbeing outcome variables in the NIDS dataset prevents us from providing a conclusive interpretation of our findings in terms of outcome variables different from the probability of being in a specific labor market state. We will further explore this issue when we consider other heterogeneous effects that allow us to capture the characteristics associated with different responses to the CSG by the labor supply of women and men. At this stage of the investigation, it is worth noting that by deriving the predicted probabilities of being in the NEA state for treated and control individuals from the coefficients in Table 3, we obtain that the share of women out of the labor market is

equal to 41 percent for the non-treated women and 49 percent for the treated ones, compared to 17 percent and 26 percent, respectively, for the male population. Hence, as the positive marginal effect (i.e., the percentage point difference between the probability of being NEA for treated and non-treated individuals) in the case of women produces a worsening in an initial condition of great disadvantage, the evidence clearly shows that the CSG did not improve gender equality on the labor market, at least considering the case of the labor supply of the parents of beneficiary children.

Before focusing on the further analysis, it is necessary to stress that to test the robustness of the results presented in Table **??**, we also performed estimations using a two-step propensity score (PS) method and an inverse distance weight (IDW) method. In more detail, following van der Klaauw (2002), the two-step PS method is performed by directly introducing the instrumental variable obtained in equation 2 into equation 1. The estimated parameters obtained from the PS method allows us to control for whether there are other factors influencing our identification strategy[24]. In the present case, this threat can emerge since not all households with a child in the eligible age range receive the CSG, as they must also meet an eligibility requirement based on the income means test, and this criterion has changed over time (see Appendix A). Note that the NIDS dataset does not provide the necessary information to examine these changes directly. The IDW method consists of introducing a weight, defined as the reciprocal of the distance of each individual from the cutoff, into equation 1. In this manner, we assign a higher weight to those observations that are near the cutoff. The IDW method allows us to show the constancy of the estimated parameters when we move from the cutoff. Since no statistically significant differences are found when these two methods are applied, we omit reporting these results (which are available from the authors upon request).

[24]See d'Agostino et al. (2017) for a detailed discussion of the two-step PS method and related issues.



(a) Employed

(b) Searching

(c) Non-searching

(d) NEA

Figure 2: Marginal effects of gthe CSG on outcome variables, by education level

Notes: The figure shows marginal effects, estimated using equation 3, and 95 percent confidence intervals for the outcome variables. Less-educated individuals (L edu) have no education or a primary education degree, whereas more-educated individuals (M edu) have a second education degree or higher (see Table 1).

4.3. Other sources of heterogeneity: marginal effects

To clarify the entire picture and try to provide a thorough interpretation of the results, we now investigate whether the different behaviors of women and men are driven by differences in some other relevant individual and household characteristics. In more detail, we calculate how several other sources of heterogeneity affect the impact of the CSG on the labor market outcomes of female and male adult recipients. To synthetically present these results, we ran an estimation of the marginal effects of the program with respect to these heterogeneity dimensions for each outcome variable and taking into account the gender dimension. On the

basis of this information, we can add more detailed insights to our analysis and speculate about possible transmission channels of the effects of the program on the labor supply of the parents of beneficiary children.

We present in Figure **??** the results obtained when we disentangle the population of individuals into less-educated (L edu) and more-educated (M edu) males and females. We recall that less-educated individuals, in our specification, have no education or at most a primary education degree, whereas more-educated individuals have at least a second education degree. All the panels of the figure are constructed in the same manner and show the marginal effects of the impact of the CSG for the aggregate population of males and females and then distinguishing by level of education. A remark to aid interpretation of the figure is in order (see also Appendix B). The marginal effects between treated and non-treated individuals are significant at the 5 percent significance level when their confidence interval does not cross the zero line. In addition, to have statistically significant heterogeneous effects, it is necessary that the estimated marginal effects for the factors of heterogeneity (L edu, M edu) are significant and different from the effect of the program on the aggregate population of males and females. Hence, the marginal effects must be significant and outside the confidence interval of the compared aggregate marginal effects for the whole population of males and females.

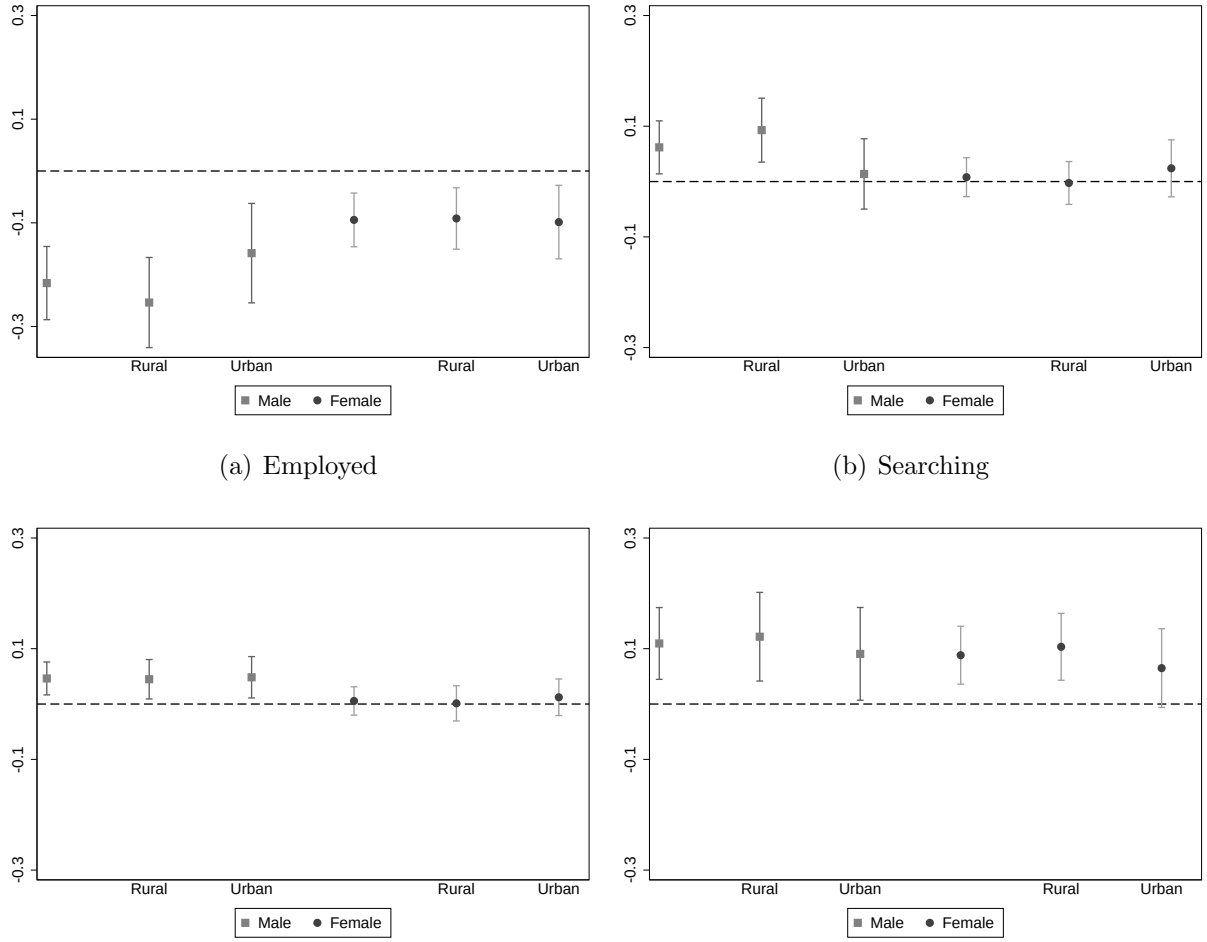
The figure highlights some interesting results. The first panel shows that considering how education affects the impact of the CSG on the employment outcome of treated men and women, no statistically significant heterogeneity emerges. However, in aggregate terms, the decrease in the probability of being in the state of employment for treated men, compared to non-treated ones, is larger with respect to the same marginal effect of the CSG on women.

From the second panel, we see a significant and positive marginal effect on more-educated men for being in the labor market as searching unemployed, whereas the marginal effect for the less-educated men is not significant. Hence, we can conclude that the heterogeneous effect is significant because the increase in the probability of being searching, in response to

receiving the grant, concerns only the more-educated men. Similarly, from the third panel, we see a significant and positive marginal effect on more-educated men for remaining in the labor market as non-searching unemployed. The last panel shows that less-educated men have a significant positive marginal effect for the probability of becoming NEA. In contrast, in the case of women, we find a significant and positive marginal effect for more-educated women in terms of participating in the labor force as non-searching unemployed. In addition, the last panel shows that less-educated women have a significant and positive marginal effect for the probability of becoming NEA. However, the results in the last panel have to be taken with caution since the confidence interval of the marginal effects for the more-educated individuals cross the zero line, but they remain statistically significant at the 10 percent significance level.

These results, taken together, suggest that the effect of the exposure to the CSG is strongly affected by the education level, especially for the male population. This finding is in line with expectations, as a large body of literature shows that unemployment in South Africa is much higher for less-educated workers (Bhorat, 2012; Banerjee et al., 2008; Burger and von Fintel, 2014; Cichello et al., 2014; Fourie and Leibbrandt, 2012; Leibbrandt et al., 2013; Yu, 2013a, 2013b).

A second significant aspect of the analysis concerns the area of residence of women and men. Figure **??** distinguishes between living in rural and urban areas. The structure of the figure is the same as the previous one. The figure shows that in the case of the male population, living in an urban area corresponds to a minor negative impact of the CSG on the employment probability, and living in a rural area corresponds to a positive effect on the probability of being searching unemployed. We do not find any statistical heterogeneous effect in the male population when non-searching unemployment is accounted for. A less clear pattern emerges for the probability of becoming NEA for male individuals. In this case, we find that the impact of the CSG on the probability of men to exit from the labor market does



(a) Employed

(b) Searching

(c) Non-searching

(d) NEA

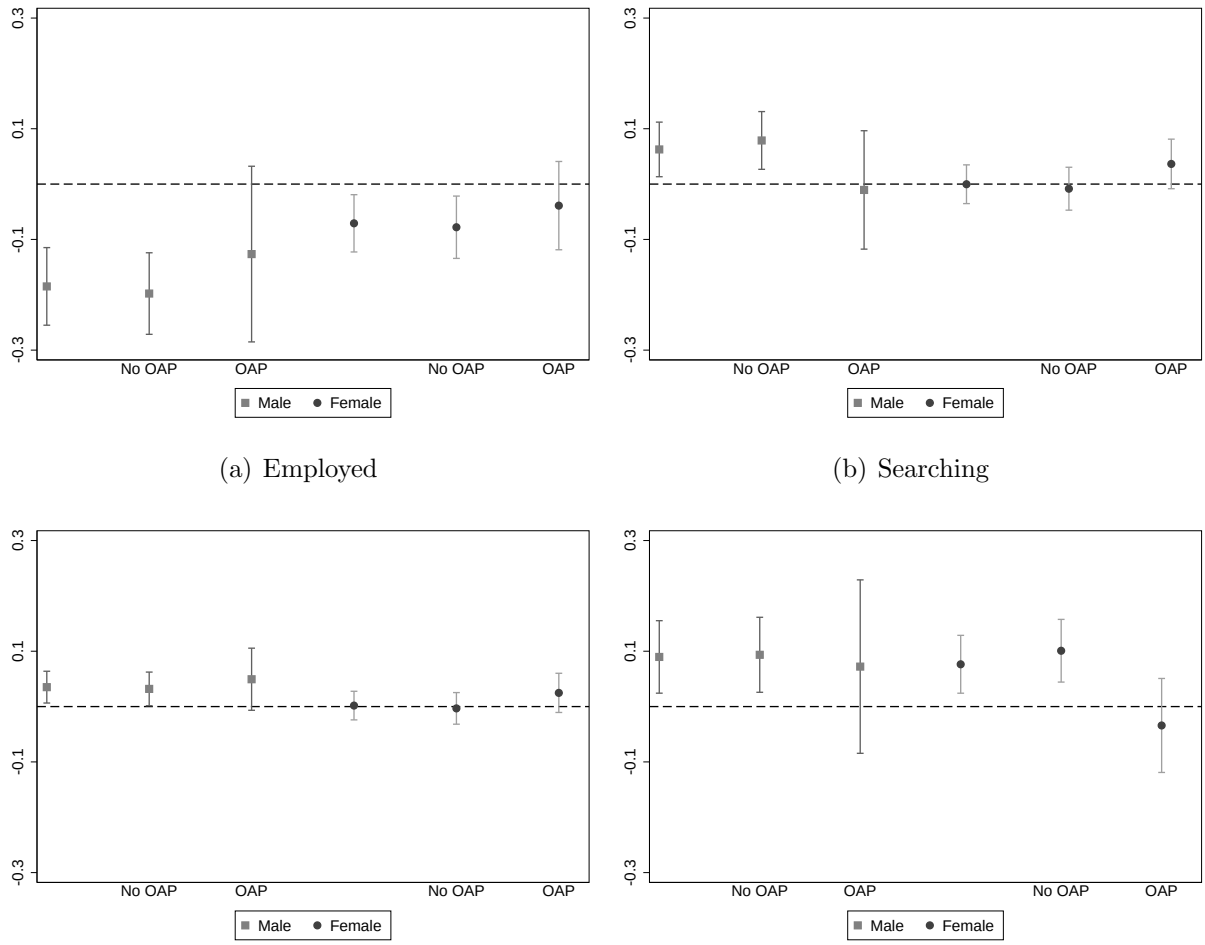
Figure 3: Marginal effects of the CSG on outcome variables, by geographical location
Notes: The figure shows marginal effects, estimated using equation 3, and 95 percent confidence intervals for the outcome variables. Individuals living in farms are included in the rural area of residence.

not depend on the area of residence. Differently, the only statistically significant result that we find within the female population concerns the impact on the probability of exiting from the labor market, which is positive and significant for women living in rural areas compared with ones living in urban districts[25].

Taken together, these results confirm that in rural areas, there are more stringent constraints that hinder labor force participation compared with urban areas. The results suggest that

[25]The estimated parameter for women living in urban areas is very close to the 5 percent confidence interval.

the hypothesis that the grant is shared to finance the fixed-search costs for people living in rural areas (see Section 2) is partially confirmed, but only in the case of male individuals. As for women, it seems that, given the harsh prospects in the labor market and constraints in searching for a job, they are pulled away from the labor force when receiving the CSG.



(a) Employed

(b) Searching

(c) Non-searching

(d) NEA

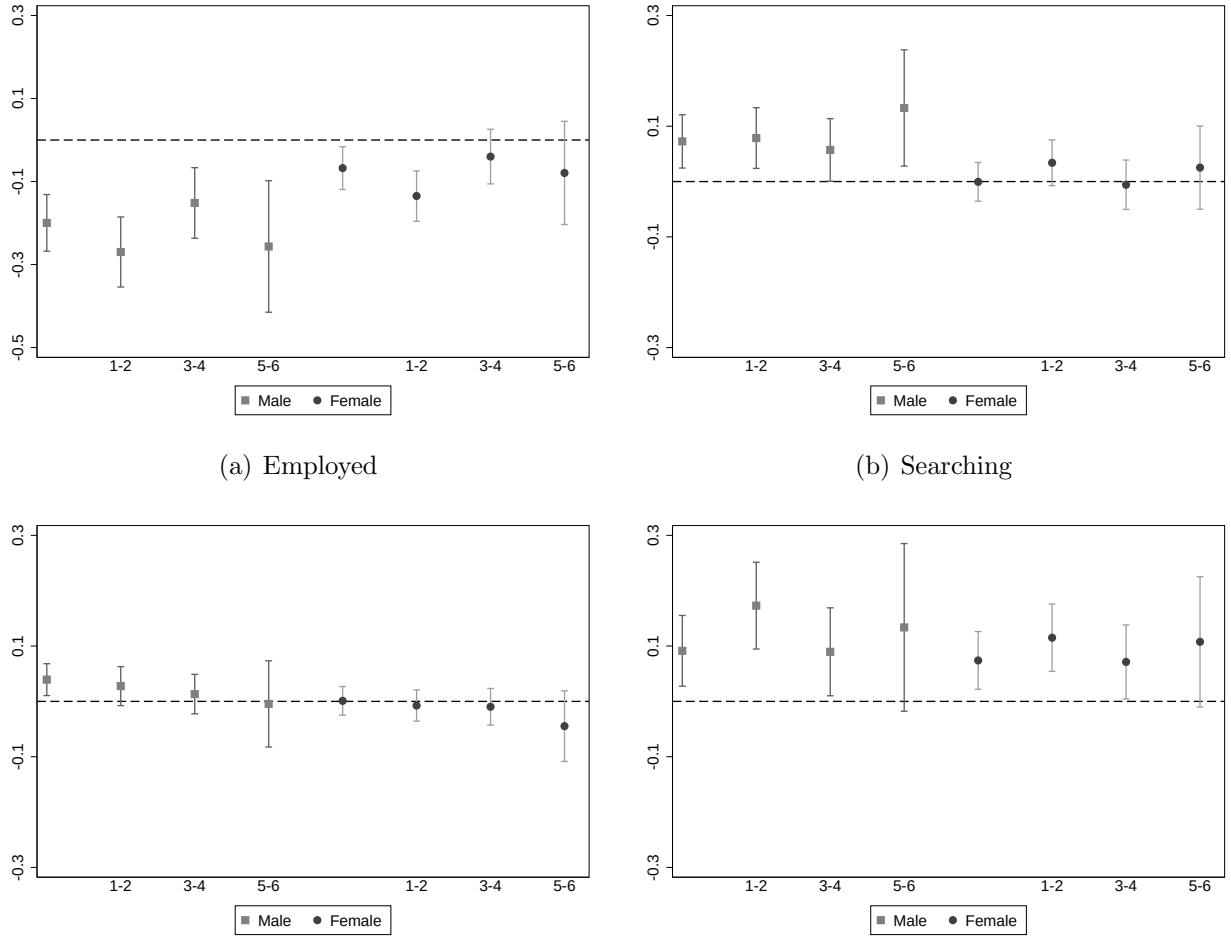
Figure 4: Marginal effects of the CSG on outcome variables, by OAP receipt in the household
Notes: The figure shows marginal effects, estimated using equation 3, and 95 percent confidence intervals for the outcome variables.

Another interesting aspect to be considered in the analysis concerns the possibility that treated women and men cohabitate with older persons receiving the OAP grant. We recall that the OAP could be used by the household members to cover, at least partially, the fixed costs of job searching and that this variable also signals that older people in the household

could support young recipients in childbearing, reinforcing the choice to devote more time to paid work outside the family (see Section 2).

Figure **??** shows that the CSG has a negative effect on the probability of being employed and a positive effect on the probability of being NEA, both of which are statistically significant, for men and women, only when there is the absence of cohabitation with OAP-receiving people. This result seems counterintuitive, given the existing literature that claims that a lack of pension is important in increasing other household member's participation in the labor market (Bertrand et al., 2003; Dinkelman, 2004). However, an interpretation of this result may be the validation of the hypothesis that social grants are shared by the household to support the fixed costs of a job search for prime-aged members and that in the absence of this support, the overall performance in the labor market for the members of the family becomes worse (Leibbrandt et al., 2013). This hypothesis is only partially confirmed when considering the effects on searching and non-searching unemployed. The impact of the absence of cohabitation with OAP recipients on the active (passive) participation in the labor force is positive (negative) and significant, even if only for men.

To complete the analysis, we present in Figure **??** and Figure 6 the differential effect of the CSG by number of treated children and age classes of treated women and men, respectively. Figure 5, which shows the differential impact of the exposure to the CSG by gender and number of treated children, reveals some interesting results. The findings indicate that for recipient women that have from one to two children, the negative impact of the CSG on the probability of being employed is stronger and, conversely, the probability of being NEA is higher compared to the aggregate marginal effects. In the case of treated men, we observe a statistically significant decrease in the probability of being in the state of employment and an increase in the probability of exiting from the labor market when they have from one to two children. As for the impact on unemployment, we see almost insignificant results when considering the non-searching state, for both men and women, and a significant positive



(a) Employed

(b) Searching

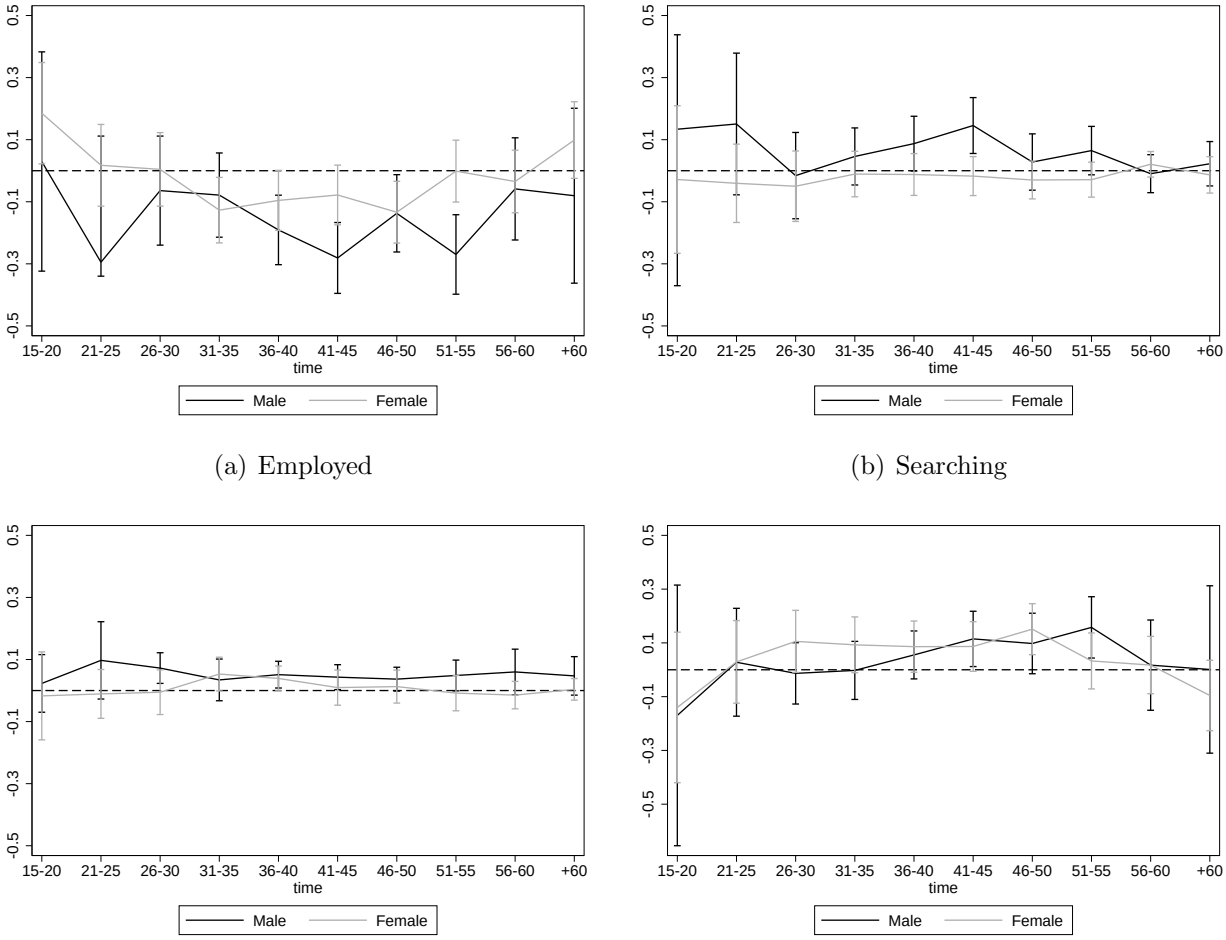
(c) Non-searching

(d) NEA

Figure 5: Marginal effects of the CSG on outcome variables, by the number of treated children
Notes: The figure shows marginal effects, estimated using equation 3, and 95 percent confidence intervals for the outcome variables.

effect on the searching-unemployment state for men having five to six treated children. These results reject the hypothesis of a perverse discouraging effect on labor market outcomes that would depend proportionally on the number of treated children. Rather, our findings suggest that the allocation of paid and unpaid work between men and women changes as soon as the family has one or two children and begins receiving the grant.

We can speculate that this result is due to some churning in the allocation of paid and unpaid work in the household related to the birth of the first and second children and also that when the number of children in the family increases, there is an increase in the need for



(a) Employed

(b) Searching

(c) Non-searching

(d) NEA

Figure 6: Marginal effects of the CSG on outcome variables, by the age of the adult recipient.
Notes: The figure shows marginal effects, estimated using equation 3, and 95 percent confidence intervals for the outcome variables.

an earned income in the household; thus, potential perverse effects are canceled out: some household's members simply cannot afford to leave their job and/or the labor force.

In Figure 6, we analyze the marginal effects for individuals by gender and age. Generally speaking, the figure shows that there is a higher impact of the policy on the middle-aged population. In more detail, for the male population, we observe that the CSG reduces the probability of being employed more in the age range of 36–55, increases the probability of actively participating in the labor force more in the age range of 36–45 and increases the probability of being NEA in the age range of 41–55. The probability of being a discouraged

worker does not significantly depend on the age range.

In the case of women, we find that the CSG reduces the probability of being employed in the age range of 30–55 years old and increases the probability of being NEA in the age range of 36–50 years old, whereas the positive impact on labor force participation is significant only for the probability of becoming non-searching unemployed in the age range of 36–40 years old. We can conclude that the CSG seems to reduce the labor supply of older prime-aged recipients and has less effect on the labor supply of young individuals.

In line with the literature, this evidence suggests that the receipt of a grant in a household determines a reallocation of paid work that pushes younger individuals into the labor market because they have better job opportunities (Burger and von Fintel, 2014; Yu, 2013a, 2013b). In contrast, the CSG seems to discourage labor supply in older cohorts, and this result can be explained by considering that these recipients are closer to the eligible age for the OAP and, in the case of women, that they are more likely to assume responsibilities related to care and childbearing in the household (Leibbrandt et al., 2013 and Section2).

In summary, the effect of the CSG on the labor supply of the parents of beneficiary children is strongly influenced in a positive manner by the education level, for both women and men, but the positive effect on the probability of remaining in the labor force as active or passive searchers is significant only for more-educated men. The positive impact of education on labor force participation, in the case of women, is significant only for the non-searching unemployment state. As expected, we find that recipients who live in rural areas, especially women, face the worst conditions in the labor market. In this case, the analysis suggests that the grant incentivizes men living in rural areas to search for a job, whereas it has a discouraging effect on women living in the same districts, as they are more likely to be pulled out of the labor market. The receipt of the OAP within the household seems to help men in funding job-search costs, whereas no OAP recipients in the household has a negative impact on women's participation in the labor market. For neither women nor men

do we observe perverse discouraging effects on labor market outcomes related to an increased number of children, whereas the analysis by gender and age reveals that the program has a negative impact on employment for older prime-aged workers, both women and men. The whole picture that emerges from these patterns is extremely complex, and providing a net conclusion about the gender impact of the CSG is challenging.

A tentative interpretation of our findings suggests that they do not reveal a dependency attitude toward grants on the part of the recipients; rather, they disclose the households' strategy to cope with the harsh labor market conditions and the burden of poverty through an intra-household reallocation of paid and unpaid work, after receiving the CSG, which is mainly driven by gender, education level, and the age of the recipients. The more deprived workers, who have less options in the labor market and low incentives for participating in the labor force, are more likely to drop out of the labor market after receiving the CSG. In particular, women with one or more children, who bear mounting responsibilities involved with unpaid reproductive and paid work outside the home, may be pulled out of the labor market, and this result is particularly strong when they are less educated, do not cohabitate with older persons who can provide support for child care, and live in rural areas, given the low chances of finding a job coupled with the high job-search costs. In contrast, treated younger prime-aged males are likely to remain employed, especially when they are more educated and live in urban areas. Otherwise, when they are well educated, live in rural areas, and can afford a job search, they are incentivized from the increase in the pooled income in the household to intensify their search activities in the labor market. This result is likely to reflect the different structures of constraints on men compared to women, i.e., their limited involvement in family labor, their strong bargaining power in the household's decisions about pooled resources and their better chance of finding suitable job opportunities.

5. Conclusions

This paper estimates the impact of the South African CSG on the labor supply of the parents of beneficiary children with the aim of uncovering how the gender of these adult recipients systematically affects their response to the transfer treatment. We use a dataset provided by the NIDS, covering the periods of 2008, 2010–2011, and 2012, and implement a fuzzy RDD to estimate the LATE and HLATE. We also identify how the effect of the CSG varies according to other sources of heterogeneity in the characteristics of women and men, i.e., education, geographical location, cohabitation with OAP recipients, number of children per household, and age of the recipient.

The empirical analysis reveals that gender considerably affected the treatment responses of the adult recipients in terms of labor market outcomes. We find a negative impact of the program on the probability of being employed, which is stronger for men than for women. However, in the case of men, the reduced probability of being in the employment state is in large part offset by an increase in the probability of becoming searching or non-searching unemployed, whereas in the case of women, it is almost entirely offset by an increase in the probability of being out of the labor force. Even if the program encouraged some adult workers to move out of the labor force, and the size of this effect is noteworthy, we do not interpret this response in terms of a dependency effect because the analysis suggests that they were the most deprived workers in the labor market. Hence, we speculate that the CSG played the role of financing the coping strategy of poor families, which involves reallocation of paid and unpaid work within the household, to face the difficult conditions of the South African labor market. Indeed, the analysis of several other sources of heterogeneity seemed to confirm this insight.

From a gender perspective, the results can be used to motivate a number of policy remarks on a broader scale. Ultimately, this paper demonstrates that gender is a lens that reveals the contradictions of the post-apartheid transition of South Africa toward democracy. In

particular, gender issues in South Africa highlight the limits of a social policy based mainly on providing an income safety net without addressing the conditions at the root of poverty and targeting the social barriers to equal integration of individuals in society. The notion that poverty is merely a lack of income lies behind this approach (Patel and Hochfeld, 2011). In contrast, a "transformative" approach to social protection needs to acknowledge the roles of discrimination, unequal distribution of resources and power in gender relations and to address these factors. This strategy includes a broader range of policies, such as the improvement in social infrastructure and universal provision of public goods and services to socialize the cost of childcare (nutritional support, transport, access to education and health care, childcare services, etc.), especially in remote rural areas, the gradual expansion of the social security system and training projects providing skills and links with less precarious employment opportunities. Our analysis also suggests that addressing the challenge of gender equality as a distinct goal of social policy rather than as an instrument for poverty reduction could exert a powerful push on the agenda of policy makers in this direction.

Appendix A: Identification strategy outline

CSG benefits are provided each month to eligible beneficiaries[a] and are paid to the primary caregiver[b]. The eligible population is determined according to a means test and the child's age, and these criteria have changed over time. *Figure A1* shows the timeline of policy changes in the eligible population and in the amount of the grant, from 1998, when the program was introduced, to the last year of our evaluation (2012). In the case of the income criteria, the means test was initially based on household income, and the ceiling was fixed at the nominal level of R800 in urban areas and R1,100 in rural areas for 10 years. However, in 1999, to increase take-up rates, the government altered this rule to one that considered only the income of the primary caregiver plus her/his spouse. Eligibility was expanded again in 2008: the Department of Social Development defined the income ceiling as 10 times the value of the grant paid to the single primary caregiver of the child (double for married caregivers) so that the means test would automatically keep pace with inflation.

A1. Identification strategy outline

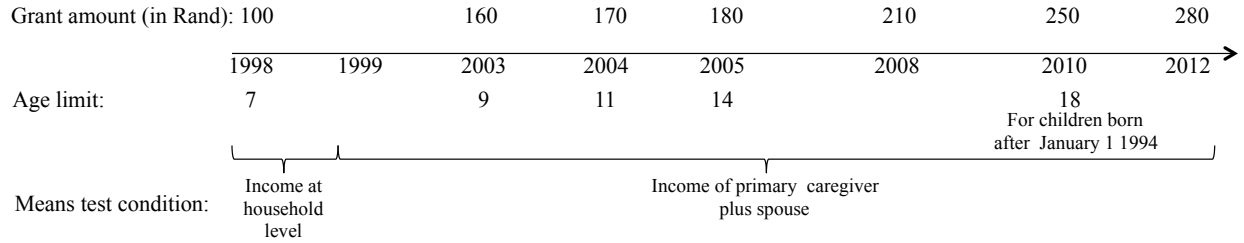


Figure A1 also shows changes in age limit criteria. When the program was introduced in 1998, age eligibility was limited to children under 7 years old, but it was later gradually raised: in 2003, it was extended to children up to their 9th birthday; in 2004, up to their 11th; and in 2005, up to their 14th. From January 1, 2010, eligibility was further extended so that children born after January 1, 1994, were eligible until their 18th birthday, whereas those born before that date lost eligibility at 14.

[a]The grant is given for each beneficiary child up to a maximum of 6 children per caregiver. The transfer was fixed at a level of R100 per month in 1998, but this has increased over the years, reaching R280 in 2012 (and R320 in 2014). Since 2008, the amount of the grant has been adjusted every year for inflation.

[b]The primary caregiver is defined as the person who takes primary responsibility for meeting the daily care needs of the child without payment. In 98% of the cases, the caregiver is a woman of the household in which the child lives.

Appendix B: Marginal effects for the heterogeneity by gender and other covariates

To facilitate the interpretation of Figures 2-6, we report, as an illustrative example, the estimation of the marginal effects for the heterogeneity related to gender and education, corresponding to Figure 2.

Table B1: Marginal effects of the CSG on outcome variables, by gender and education

	Male			Female		
	Aggregate Male	L Edu	M-H Edu	Aggregate Female	L Edu	M-H Edu
Employed	-0.217 ***	-0.262 ***	-0.179 ***	-0.102 ***	-0.08 **	-0.12 ***
	(0.036)	(0.051)	(0.043)	(0.026)	(0.034)	(0.032)
Searching	0.051 **	0.025	0.074 **	0.012	-0.007	0.028
	(0.026)	(0.035)	(0.033)	(0.018)	(0.019)	(0.024)
Non-searching	0.039	0.040 *	0.039 **	0.005	-0.027	0.033 **
	(0.015)	(0.021)	(0.016)	(0.013)	(0.019)	(0.016)
NEA	0.133 ***	0.207 ***	0.07	0.09 ***	0.118 ***	0.066 **
	(0.032)	(0.046)	(0.039)	(0.026)	(0.035)	(0.032)

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