# Long run educational and spillover effects of unconditional cash transfers: Evidence from South Africa

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## Long run educational and spillover effects of cash transfer policy

ABSTRACT:

Cash transfer (CT) policy is promoted as an important financial vehicle to address household poverty and bring positive societal development. This study investigates the impact of an unconditional CT policy on children's education outcomes focusing on both the primary and secondary phases of education. We also examine the spillover effect of CT policy on parents' employment. To identify these effects we focus on South Africa and exploit the changes in age eligibility requirements of the CT policy to build credible control and treatment groups based on birth cohort. Our results show that CT policy improves reading and writing abilities at both the primary (by 3.7% and 3.3% respectively) and secondary education levels (by 10.2% and 10.1%, respectively) but it fosters school attendance only in secondary education. We also provide evidence that, for primary education students, the effects are only significant for boys. Notably, the positive effects of CT programs are also confirmed by the presence of spillover effects to other members of the family in our observance of increases in both mothers' and fathers' employment outcomes (by 35% and 34%, respectively). Therefore, in this paper we provide robust evidence that unconditional CT policy supports resilient development of the country's population in several dimensions that go beyond the educational achievement of targeted children.

## 1. Introduction

According to the recent South African Human Rights Commission report published in 2014, roughly 47% of children between the ages of 0-17 were living in poverty stricken households. This figure gives rise to serious grounds for concern especially if we take into account the evidence that links child poverty to poor educational attainment in the latter stages of adulthood (Almond and Currie, 2011; Le Thuc and Behrman, 2017). As in many other countries, the South African government tried to mitigate this significant problem by rolling out cash transfers (CT) to poor families, with the main goal of fostering the development of young children.

These types of programs are generally introduced as a result of theoretical evidence that household income is the strongest predictor of children's educational attainment (Barrow & Schanzenbach, 2012). On the other hand, some scholars do not support this view and claim that CT programs are not an effective policy to foster children's development. As hinted by Handa et al., (2017), there are perceptions that CTs are mere 'hand-outs' which create dependency on the state and discourage parents from seeking employment.

In South Africa, despite the popularity of CT policy to poor households, there is no study that has analyzed their impact, neither for the targeted children nor for the rest of the family members. Even a recent review article on CT programs shows no evidence of such analyses being done in the South African context (Herman et al., 2016). Therefore, our aim in this paper is to fill this gap in the literature by exploring the impact of a large CT program in South Africa on children's educational outcomes as well as on potential spillover effects on their parents' employment outcomes.

Although many studies have analysed the impacts of CT on several outcomes, to the best of our knowledge, none of the papers focus on outcomes for both children (in terms of educational achievement) as well as for parents (in terms of employment).

For example, CT policy in Colombia has been associated with improvement in labour participation rate, employment, and job search for parents who received the grant (Barrientos and Villa, 2013). A similar outcome is reported in Uganda where CT was associated with increases in female earnings due to the rise in microenterprise ownership and income (Blattman et al., 2015). However, in these cited studies, it remains to be seen whether CT improves both parent employment and children educational outcomes concurrently. Thus, there is a need in the literature to investigate this intersection (Bastagli et al., 2016).

In this paper we aim to answer the following questions: (1) What impact does unconditional CT exert on the ability to read and write, as well as on school attendance in both the primary and secondary phases of education? (2) Is the CT program inducing a substitution effect and discouraging/encouraging parents' employment? (3) Lastly, are there gender-based differences in the impact of CT policy? We believe that answering these interrelated questions represents a key element to promote the understanding of the ways in which unconditional CT policy can foster the achievement of multiple development goals.

To identify the effects, we exploit several extensions in the age eligibility threshold of the program in order to obtain clearly defined treatment and control groups based on the birth cohort of the children. We use large and recently released labour force and household surveys from Statistic South Africa which contain information on both children's educational outcomes as well as parents' employment and CT program receipts. Our results show that CT policy improves reading and writing abilities at both the primary and secondary education levels but it only encourages school attendance in secondary education.

We also provide evidence that, for primary education students, the effects are only significant for boys. Notably, the positive effects of CT programs also foster spillover effects to other members of the family as we document increases in both mothers'

and fathers' employment outcomes. Thus, even if the main aim of the CT policy was not promoting the labor market integration of the parents, this presents an important spillover effect of the policy as it has been widely documented that parents with better employment will very likely have a positive impact on children's wellbeing. In light of these positive outcomes, we conclude that unconditional CT policy supports resilient development of the country's population in several dimensions that go beyond the educational achievement of the targeted children.

The remainder of the article is organized as follows. Section two gives an overview of the literature. Section three discusses the history and characteristic of the CT program in South Africa. Section four discusses the methodology, section five presents the estimated results, section six shows several robustness checks and the last section concludes.

## 2. Literature Review

In the literature, two reasons are often cited as to why the CT policy is expected to improve children's education outcomes in poor households. Firstly, the distribution of cash improves financial constraints of poor families (Akresh et al., 2013). This improvement in financial status is understood to influence parents to forgo the income received from children's labour activities. As such, children remain at school for the required period. Secondly, CTs lower the costs of attending school, allowing parents to allocate money towards tuition fees, books and uniforms. These factors are also reported to enhance education outcomes (Baez and Camacho, 2011).

In Mexico for example, the CT program called Programa Nacional de Educacion, Salud y Alimentacion (PROGRESA) has been found to increase school attendance and reduce the participation of children in early labour activities (Skoufias and Parker, 2001). Similar results were reported in Ecuador where the CT program called

Bono de Desarrollo Humano (BDH) resulted in a 10% increase in school attendance and a 17% decrease in child labour (Araujo and Schady, 2006).

Nevertheless, there are only a few studies that have looked into how CT policy influences education outcomes between boys and girls. In Turkey, Ahmed et al., (2007) reported that the Social Risk Mitigation Project implemented in 2004 resulted in higher school enrolment of girls compared to boys. Attanasio et al., (2005) discovered that the CT policy has been effective in increasing school enrolment particularly during the secondary phase of schooling in Colombia. Unlike in Turkey, boys were reported to have benefited more from the program compared to girls. This finding is also supported by Akresh et al., (2013). In light of these inconsistencies, more gender-based studies are still needed to advance this branch of the CT programs literature.

All the programs cited above are conditional CT programs (see Harman et al., 2016). This means that money is given to the caregivers under the condition that they should use it for human capital development, such as enrolling the child to school (Rawlings and Rubio, 2003). Due to the nature of such condition, it is widely expected that children's education outcomes should improve upon receiving the money (Attanasio et al., 2010).

The scenario might be slightly different under unconditional CT programs, as is the case in South Africa. The caregiver may not direct the money solely towards the child's needs. Instead, the caregiver may use the child support grant funds on other household priorities (Barber and Gertler, 2009). For example, caregivers may choose to use the money for job seeking purposes in an attempt to earn better income and escape poverty. This spillover effect of the child support grant program to other members of the household has not been explored vigorously. So far Eyal and Woolard (2011) found that child support grant enhances labour participation of South African women. However, this analysis was limited since it excluded the potential

long run spillover effect to other household male counterparts. There is a need to extend this literature beyond the perception that cash transfer has a buffering effect on poverty-stricken households in South Africa (Mudzingir et al, 2016).

## 3. History and characteristic of the cash transfer program in South Africa

The unconditional CT program in South Africa is managed under the child support grant policy. This is a post-apartheid policy aimed at improving the conditions of children particularly by providing them with access to food. The program was introduced in 1998 at a value of R100 (USD7) per child every month. This amount is 250% higher than the median hourly wage of a domestic worker in South Africa (Global wage comparisons, 2012). Take up has increased dramatically (see figure 1) over the past decade and the grant amount has been increasing slightly each year to keep up with the pace of inflation. At the end of March 2015, over 11.7 million children aged 0 – 17 years were part of the program.

*Eligibility:* There have been two important changes in the eligibility criteria related to the age and income thresholds. In 1998 the grant was only initially available to cater to children aged 0- 6 years (see figure 2). Each child at that time received R100 per month. This amount has been gradually rising and has been extended to older children in the years 2003, 2005 and 2008. In January 2012, eligibility was further extended to cover children until age 18.

The second important change concerns income eligibility. In 1998, children whose primary caregiver(s) had a monthly household income of R800 or less and lived in a rural area were considered suitable for the CT program. The household income threshold was R1,100 per month for those who lived in urban areas. These household income thresholds remained static for 10 years until a new formula was introduced, setting the threshold at 10 times the amount of the grant *vis-a-vis* personal income. This meant that anyone who earns less than ten times the value of

the grant as of the year 2008 (equivalent to R2,300) would now be covered under this policy. Following this, if the combined income of married couples is less than R6,600 per month, they qualify for the grant, and for single parent households, the threshold is R3,300 per month. The grant pays R330 per child every month.

*Administration:* The government, through the Department of Social Development, administers the CT program in line with the country's Constitution which states in section 27(1) (c) that: "Everyone has the right to have access to social security if they are unable to support themselves and their dependents." As a matter of law, the state is required to ensure the progressive realization of these rights by employing legislative and other measures within its available resources to provide for the poor. To date, the majority of the rural population falls under the CT program (see figure 3).

*Duration and Generosity*: As of 2016, a monthly amount of R330 was paid per child until the child turns 18, with no limit to the number of children in each family. To better understand the generosity of the benefits in real terms, we compared the monthly transfers of three children to the average wage per month of a highly paid domestic worker. We used three children as the average number per family based on the findings by Statistics South Africa in the 2012 census. We found that the combined monthly cash transfer for three children (R990) is equivalent to 41% of the of the average income for African males at R2,400 (Cosatu, 2015). This evidence suggests that the CT transfer represents a substantial source of income for poor families especially in rural provinces.

*Additional Requirements or Conditions:* The state only requires the primary caregiver(s) to be responsible for looking after the child on a daily basis. Many laws also explicitly require that the parent(s) be of "good morals" and a legal citizen of the country. There are very few instances in which a parent fails to comply with these conditions. The most common cause of discontinuance of this CT program was children moving into age brackets excluded by the child support grant policy.

(SASSA, 2017). Thus, the CT grant is an unconditional CT policy designed to address the challenges of household poverty.

## 4. Database and Methods

We use a recently released database, the General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

The GHS and LFS are annual surveys of approximately 120,000 individuals and more than 20,000 households. These surveys aim to provide information on any changing trends in the composition of South African households and their labour market outcomes.

Both GHS and LFS are complex surveys; the sampling procedure involves explicit stratification by province, and within each province, by urban and non-urban areas. Household units are drawn under this stratification. For each household unit, individual characteristics are presented, including age, gender, educational outcomes, health outcomes, income levels, social grant status and other general socio-economic status variables. We linked both datasets using the household unit number to create a panel data for our policy analysis.

In order to study the impact of the CT policy, we select children born between 1992 and 2001 and focus on educational outcomes at ages 11 and 14, which correspond to primary and secondary education, respectively. As the CT program has changed the age eligibility thresholds in various years, we are able to define clear treatment and control groups based on the birth cohorts of the children. Thus, we make use of the variations in the age eligibility criteria of CT programs to identify the impacts of CT programs on educational outcomes of affected children as well as spillover effects on the employment status of their parents.

The yellow and blue lines in Figure 4 represent the 11 and 14 year old cohorts considered in our analysis, respectively. In both the age 11 and 14 groups, the cohorts shaded in red refer to controls (because they are not receiving the CT grant),

while those shaded in green are the treated, recipients of the CT grant. The outcomes that we analyze are all dummy variables reported by the head of the household when asked about the children: being able to read, being able to write, and the probability of attending school[1]. We recognize that there may be additional aspects in the ability to read and write not captured by our binary outcome variables. However, the household survey does not provide information on children's test scores or grades. Thus, we interpret our results as providing evidence of strong changes in the writing and reading abilities of affected children, while not being able to capture more qualitative changes in the ability to read and write. We focus on two key ages of children: at age 11, which corresponds to the mid-grade of primary education, and at age 14, corresponding to the first year of secondary education in South Africa. Furthermore, we also explore the existence of spillover effects of the CT program to other members of the family by using as an outcome the probability that the mother and the father are employed.

The GHS also includes information on whether the household is part of the CT program. However, we do not want to directly compare individuals receiving the program to those not receiving it as these two groups of households can be different in many additional dimensions that can have direct impacts on educational outcomes (for example, income, which is one of the eligibility requirements for the cash transfer program, or information barriers for the poorest households). For these reasons, we do not use an OLS model (nonetheless, we present the results of this model in the robustness checks section) and we will estimate a two stage least square (2SLS) model in which we instrument the receipt of the CT program with the birth cohort of the children.

The two equations that we estimate are the following:

[1] This is a binary variable as the question asked to the household is whether the child is currently attending school.

$$Y_i^a = \alpha_1 + \beta_1 \widetilde{CT}_i^a + \delta YearFE + \gamma ProvinceFE + \sigma Female_i + \theta MEdFE + \rho FEdFE$$

$$CT_i^a = \alpha_2 + \beta_2 \text{Treat}_i^a + \delta YearFE + \gamma ProvinceFE + \sigma Female_i + \theta MEdFE + \rho FEdFE$$

In the first equation (second stage or outcome equation) Y is one of the outcomes for Individual *i* at age *a* (11 or 14 years old), and "$\widetilde{CT}$" is the predicted receipt of the CT program. The regression includes calendar year fixed effects (which are equivalent to including cohort fixed effects), province fixed effects (including 9 provinces in South Africa)[2] and a dummy for female (for the regressions wherein we estimate the effects for both girls and boys). Furthermore, we also include controls (fixed effects) for the educational level of both the mother and the father in order to proxy for the household socioeconomic characteristics[3].

In the second equation (which corresponds to the first stage regression of the 2SLS), participation in the CT program is estimated as a function of the treatment dummy variable, which identifies the cohorts that have been exposed to the CT program (as depicted in Figure 4). Therefore, when we look at the outcomes at age 11, we can see in Figure 4 that cohorts born between 1992 and 1996 were not affected by the CT program, thus constituting the control group. Meanwhile, cohorts born between 1997 and 2001 were affected by the CT program and constitute our treatment group. When the outcomes are analyzed in the secondary education stage at age 14, the cohorts that are exposed to the CT program at this age are those born between 1998 and 2000, whereas the cohorts that are not exposed to the CT program are those born between 1992 and 1997. As the determination of receiving CT is based both on the age eligibility threshold as well as the income threshold, we also include parental educational categories as proxies for household income. The first stage regression

[2] Due to a multicollinearity problem, the year 2004 and the Free State province were omitted in the estimation.

[3] See Table A5 in the Appendix for a description of the educational categories.

also controls for gender as well as year and province fixed effects. Thus, the year (or cohort) fixed effects account for any trend in the outcome variable across cohorts and the province fixed effects control for any baseline (time-invariant) difference in the outcome variables across provinces.

In all IV models we need two assumptions to be fulfilled: first, the instrument has to be relevant in explaining the probability of being treated and this will be corroborated by the F-test of the first stage equation; and second, the exclusion restriction needs to hold, that is, the instrument should not influence the main outcome directly through any channel other than treatment. In our case, this assumption means that differences in educational achievement between the treated and control groups can only be due to the participation in the CT program. As we include the cohort (or year) fixed effects, we are capturing any improvement (or deterioration) in educational achievement in any subsequent cohort (with respect to the previous ones) that may be due to other causes such as new infrastructure, changes in cultural habits or economic development in a general sense. For example, if we look at Figure 4, which defines the treated and control groups, there is no reason to believe that cohorts born in 1992 to 1996 (control group) should have different educational outcomes than the cohorts born in 1997 to 2001 (treatment group) when observed at the same exact age (11 or 14 years old), after controlling for year (or cohort) fixed effects. There is no other event in South African history that explains any difference in education that would affect exactly the cohort born in 1997 to 2001 but not the cohort born just one, two or three years before, from 1996 to 1992. For this reason, we are confident that the exclusion restriction is satisfied in this case. In any case, in the robustness tests section we will provide additional exercises (placebo regressions) that will provide stronger evidence to reinforce the fulfilment of the exclusion restriction assumption in our context.

## 5. Results

When analysing the results of the 2SLS estimations, we can see in Table 1 that our treatment variable is a strong determinant of the probability of receiving the cash transfer. The F-statistic of the first stage regression is very large, pointing towards the strong validity of our instrument as a proxy of the receipt of the cash transfer. Thus, in Table 1 we can also observe that the receipt of the cash transfer, as proxied by the birth cohort instrument, is a determinant in improving reading abilities for children at age 11, in primary education, as well as at age 14, in secondary education. More specifically, we can see that the probability of being able to read increases by 3.2 percentage points in primary education, and by 9.6 percentage points in secondary education. As the mean ability to read at age 11 is 87.6 in our sample, the cash transfer increases the probability of these South African children being able to read by 3.7%. Similarly, the mean ability to read is 93.6 at age 14, which implies an impact of 10.2% from the CT program.

The CT program also improves writing abilities, although the impact is somewhat milder than the impact for reading abilities. In Table 2 we can see that the CT program increases writing abilities by 2.89 percentage points for children aged 11 years old and by 9.7 percentage points for 14 year olds. These results imply that the cash transfer program increased writing abilities by 3.3% and by 10.1% for 11 year olds and 14 year olds, respectively.

We next examine whether the cash transfer program also had a positive impact in fostering school attendance in both primary and secondary levels. Table 3 reports the results for the probability of attending school for children belonging to the treated and untreated groups. What we find is that the CT program does not increase school attendance in primary education while it does promote school enrolment for secondary education. More specifically, the cash transfer program increases school attendance by 1.77 percentage points, which implies an impact of 1.7% by the policy for 14 year old children. This is an interesting result as the CT program is able to

allow South African teenagers to stay longer in school with all the positive long-term outcomes associated with each additional year of education recognized in the literature on years of schooling and long-term economic outcomes. However, we can see that the impact of the policy on school attendance is rather small as attendance rates are already extremely high for both 11 and 14 year old children.

We now focus on whether these positive outcomes on educational variables are similar for both genders, or we would see a stronger effect for girls or for boys. In order to explore such possible differences we repeat the same regressions only for boys and then only for girls. In tables 4, 5 and 6 we can see that the cash transfer improves reading and writing abilities as well as school attendance only for boys at the primary education level. Indeed, the CT program does not show any significant effect on these three outcomes for girls during the primary education phase.

The picture is different for secondary education students. The CT program increases reading and writing abilities for both boys and girls and the impact is slightly stronger for girls (Table 4 and 5). As for school attendance at age 14, the program increases the likelihood of attending school for both girls and boys but the impact is stronger for boys (Table 6).

Up until now we have only focused on the impact of the CT program on affected children's outcomes. Thus, we turn now to the potential existence of spillover effects of the CT program to other members of the family. We focus on the probability that the father or the mother of the affected child has a job. The idea behind this is that the existence of the monetary transfer can discourage parent's employment. However, on the other hand, if the CT program increases school attendance, as we have seen in our case, parents may increase their labour market participation in order to compensate for the lower employment participation of the child. Also, it may be the case that the extra money can help a parent's ability to search for a job in a distant location due to the increased probability of affording the transport costs.

Table 7 shows that the CT program indeed increases the probability that both the father and the mother would have a job. The impact is very strong and suggests that the extra income not only increases educational attainment and school enrolment, but also increases the probability of employment of the parents--which can potentially act as a multiplier effect on families' outcomes. More specifically, employment probabilities increase by 15.8 percentage points for fathers of treated children and by 15.6 percentage points for mothers of treated children. This implies an effect of 34% for fathers and 35% for mothers of treated South African children.

Finally, we explore the existence of heterogeneous results for rich/poor provinces. We define as poor provinces those individuals living in Eastern Cape, Free State, Limpopo, and Kwazulu Natal and we considered Gauteng, Western Cape, North West, Northern Cape and Mpumalanga, as rich provinces. This distinction was done based on provincial GDP per capita higher than USD6.25 (See world fact Altas, 2018). Figure 3 shows the percentage of CT beneficiaries in our sample belonging to rich/poor provinces.

Table 8 shows the results of the educational outcomes for children living in poor or rich provinces. We can see that, for primary education children, the CT program shows larger increases educational outcomes in poor provinces. However, for children in secondary education, the CT program provides better educational results for children living in rich provinces.

This difference may be explained by having better education facilities (libraries, scientific laboratories and computer labs) in high schools of rich provinces compared to poor provinces. Furthermore, high schools in rich areas are usually more easily accessible. As a result, students may find it easier to go to school even during weekends or to stay longer at school studying even after hours. High schools in poor provinces, on the other hand, are not always easily accessible and learners are likely to experience transport problems. Therefore, a student could not afford to be at

school after hours, risking the possibility of being stranded due to an unreliable transport system. This limits the potential education outcomes, as observed in table 8.

## 6. Robustness checks

In this section we provide a number of robustness checks and additional results to reinforce the validity of our assumptions as well as the robustness of our findings. For comparison purposes, Table 1A in the Appendix shows the results of the OLS regressions for the main educational outcomes. The variable of interest is now the variable in the survey that identifies recipients of the CT program. We also include year (cohort), province, gender and mother and father education fixed effects. As explained above, we have reasons to believe that this is not a randomly assigned program so that the OLS estimation may be overestimating or underestimating the effects of the CT program on education and employment. Although we are already controlling for a proxy of household socioeconomic characteristics (mother and father educational category), there can still be other variables that determine program participation that are unobserved and that may directly affect educational outcomes of the children such as access to the necessary information to apply for the CT program, etc. Indeed, the results in Table 1A are all substantially bigger in magnitude than the baseline results of the 2SLS models presented in Tables 1, 2 and 3 for the outcomes at age 11 and slightly smaller for the outcomes at age 14.

Also for comparison purposes, Table 2A in the Appendix section shows the results of the reduced form regressions in which we estimate the effects of the CT program on educational outcomes using directly the instrument based on birth cohort described above as our main explanatory variable (without running the 2SLS but just a simple OLS model). As expected, the results of these regressions are much smaller in size than our baseline results in Tables 1, 2 and 3 because it considers as treated all children in the affected birth cohorts (although we know that not all of them are

treated). More specifically, the results of the reduced form regressions are an order of magnitude smaller than the 2SLS coefficients, which account for the probability of being treated for cohorts exposed to the program (affected cohorts).

Finally, we run some placebo regressions in which we "pretend" that control (unaffected) cohorts were treated with a fake CT program. Thus, we exclude from the sample the cohorts truly affected by the CT program (we drop cohorts born in 1997 to 2001 for the results at age 11 and the cohorts born in 1998 to 2000 for the outcomes at age 14). Therefore, we are left with a sample of cohorts which have not been exposed to the true CT program. It is important to note that, even if they are not legally entitled to receive the cash transfer, we can see in the descriptive statistics table (Table 4A) that a small proportion of these children are indeed receiving the CT policy. This can be mainly due to two issues: 1) administrative problems that would grant the CT program to non-eligible children and/or 2) misreporting by the household head about the receipt of the transfer. Then, we assign those born in 1994, 1995 and 1996 as treated cohorts affected by the fake reform and those born in 1992 and 1993 we use as control cohorts. We run the same 2SLS used in our baseline specification and we can see in Table A3 in the Appendix that the F-test of the first stage regression is extremely low, suggesting that the instrument is not relevant. The treatment variable is not significant in any of the three outcomes analyzed: the ability to read, the ability to write and school attendance. Therefore, the results of these placebo tests analyzing the effects of the fake reforms reinforce the validity of our identification strategy. They also provide additional evidence of the fulfilment of the exclusion restriction criteria as any cohort-specific events not captured by the year (cohort) fixed effects that could be biasing our main results should also provide significant results in these placebo tests.

## 7. Conclusion

Schooling is widely seen as a crucial part of the development process and acts as a catalyst in the poverty alleviation strategy in any country. The South African government has realised that CTs targeting poor households can enhance children's level of development and break the historic legacy of inter-generational cycle of poverty. This paper has examined the effect of an unconditional CT policy on educational outcomes both at the primary and secondary levels of education using a large longitudinal sample of the South African population.

The estimation shows that cash transfers have a significant effect on improving both educational outcomes as well as school attendance of affected children. This is an important finding considering the large existing evidence in the literature that shows the positive long-term labour market outcomes of each additional year of education. We also find that the impact is stronger for children in secondary than for primary education.

When we look at gender differences, we can see that for primary education students the positive effects of the CT program are only significant for boys. On the other hand, for secondary education students the impacts are significant for both genders, and slightly stronger for girls. Also, we analyze differences on the impact of the CT program for rich and poor provinces in South Africa. We can see that, for primary education children, the CT program boosts educational outcomes to a larger extent in poor provinces. However, for children in secondary education, the CT program is associated with better education results for children living in rich provinces.

We also analyse the existence of spillover effects of the CT program to other members of the family. More specifically, we find large increases in the probability of being employed for both fathers and mothers of treated children. Thus, the potential spillover effects of such policies can be significant as families' disposable incomes

increase with parents' employment which, in turn, tend to have a positive impact on children's wellbeing. Our results are important from a policy perspective as they point out the important positive effects of unconditional CT programs for affected children and their families. We also highlight the groups of children that manage to benefit more from these types of programs.

Indeed, unconditional CTs do lead to significant social and productive impacts. The lessons derived from this paper can assist in the decision-making process of other developing countries seeking to implement unconditional CT policy in the future. This work may help other countries to build the credibility of social protection policy by strengthening the case for social protection as a much-needed investment for economic development.

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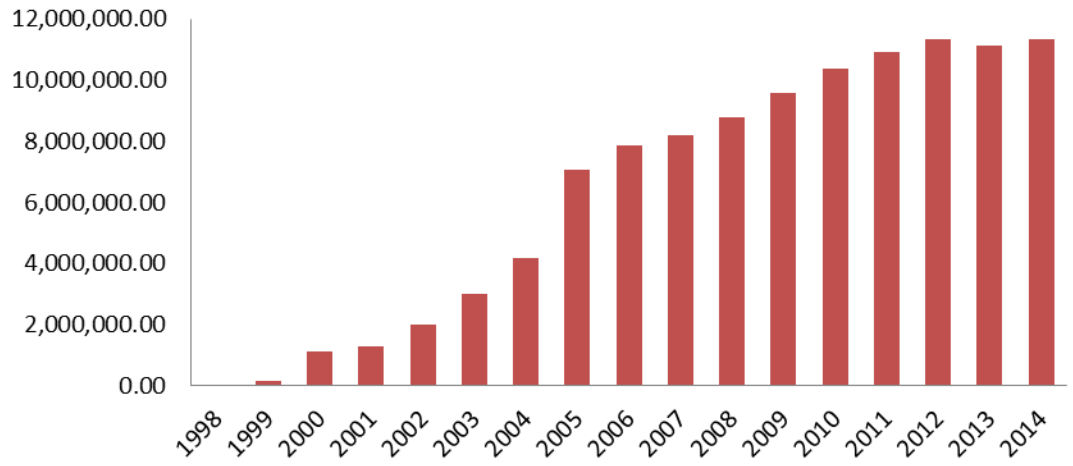
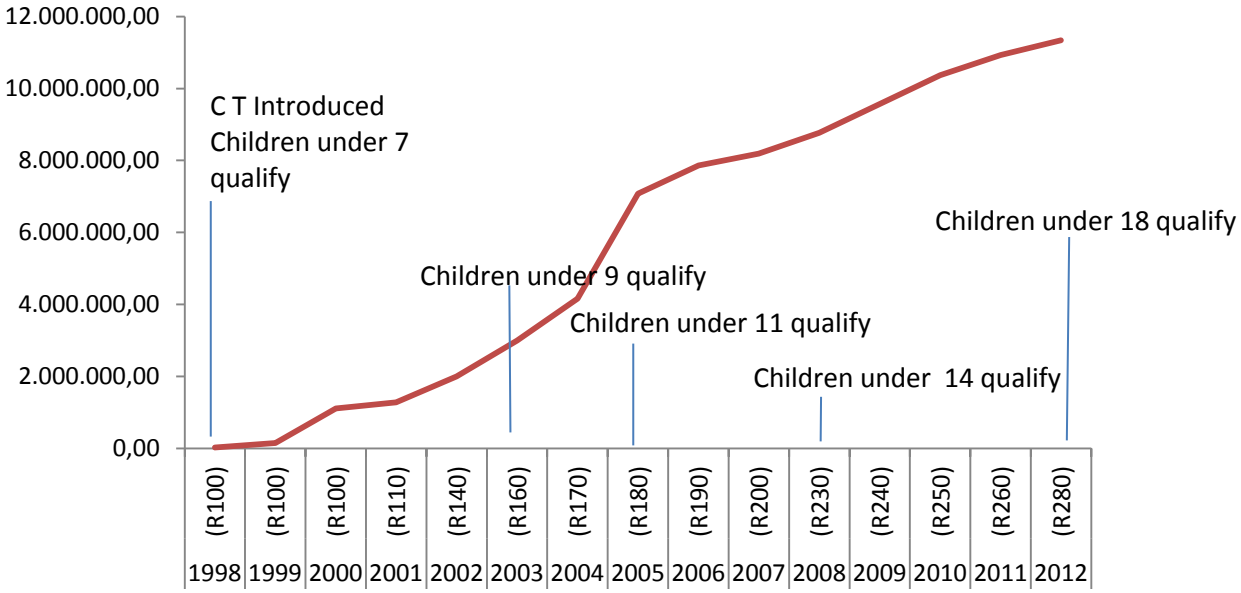
# List of Figures

Figure 1. CT take-up trend in South Africa.



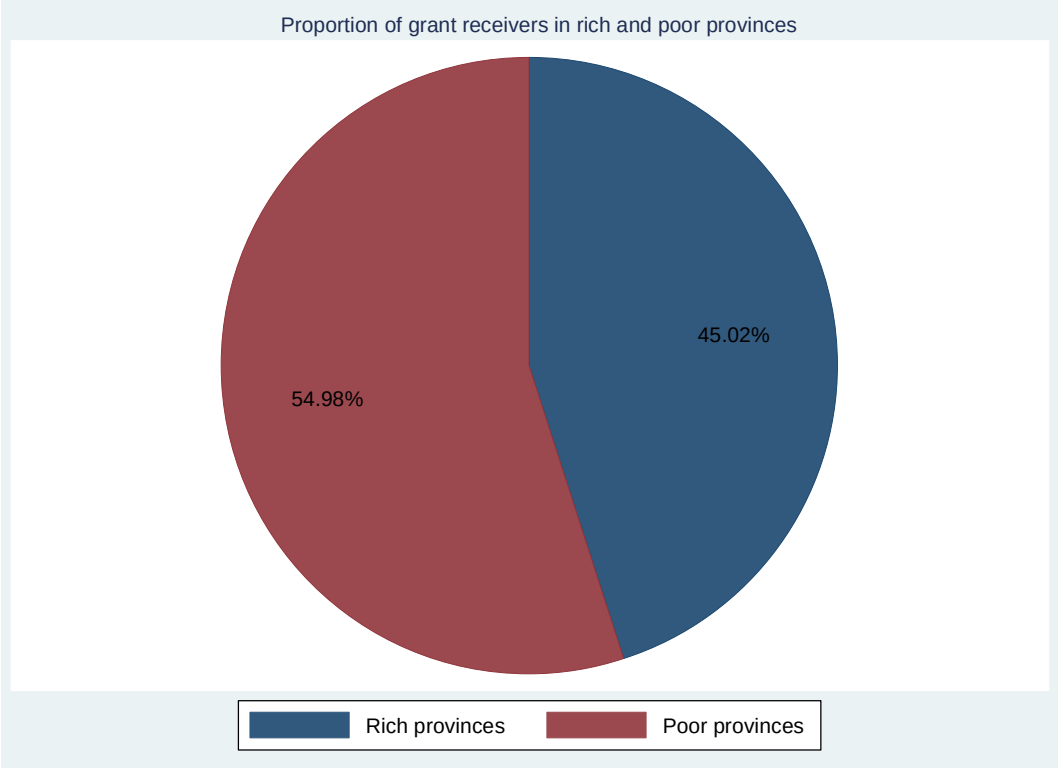

Source: Own elaboration with data from the South African Social Security Agency (SASSA) annual reports.

Figure 2. Evolution of CT pay-outs and age eligibility coverage.



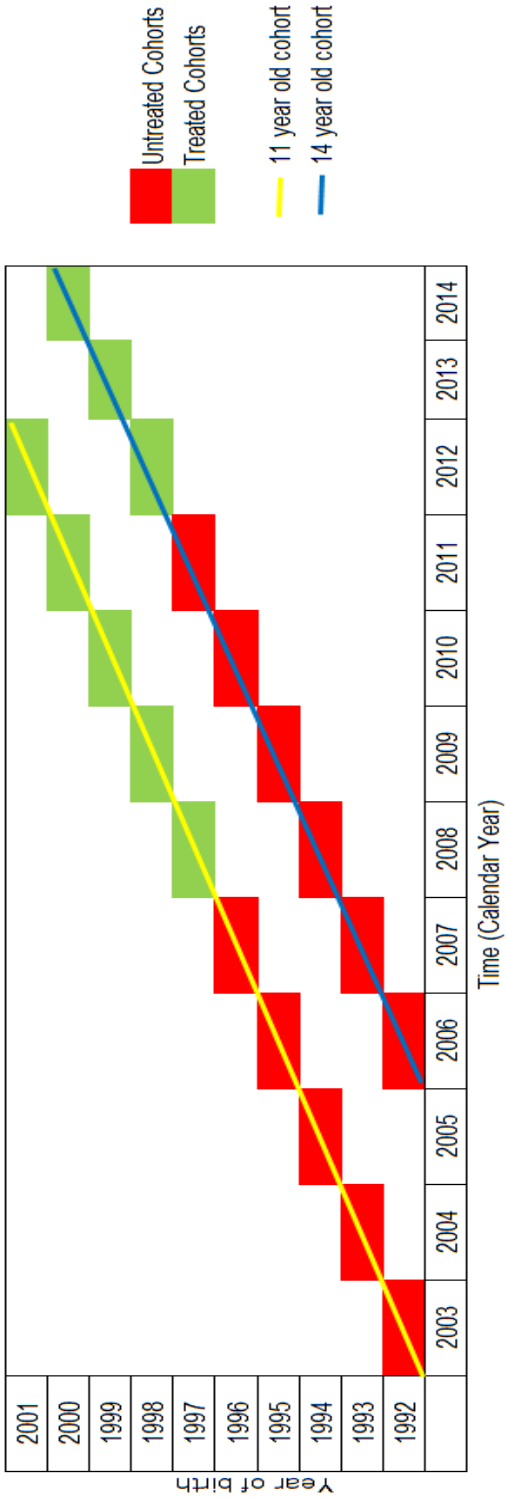

Source: Own elaboration with data from the South African Social Security Agency (SASSA) annual reports.

Figure 3. Proportion of grant receivers in South Africa by poor /rich provinces.




Source: Own elaboration with data from Statistics South Africa (STATS-SA) annual surveys.

Figure 4. Definition of treated and control groups according to the instrument (year of birth or cohort) for outcomes at the primary educational level (at age 11) or at the secondary educational level (at age 14).




Source: Own elaboration according to the South African cash transfer program rules.

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Table 1. 2SLS estimation of the impact of CT grant on reading abilities.

| 2SLS | Age 11 years | Age 14 years |
|---|---|---|
| 1st Stage | | |
| | CT grant | |
| Treatment (Birth Cohort) | 0.057*** | 0.072*** |
| | (0.0013) | (0.0013) |
| 2ND Stage | | |
| | Read | |
| CT grant | 0.0326*** | 0.096*** |
| | (0.0107) | (0.0089) |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Gender FE | YES | YES |
| Mother & Father Education FE | YES | YES |
| Mean for reading ability | 0.8764 | 0.9636 |
| Observations | 6663 | 10894 |
| F-stat 1stSLS | 385.7101 | 246.1301 |
| R-squared 2ndSLS | 0.0523 | 0.0492 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from a 2SLS model. In the first stage equation the dependent variable is the probability of receiving the CT grant while the instrument is a dummy variable equal to 1 for the cohorts born in 1997 to 2001 (or 1998 to 2000 for age 14) and 0 for the cohorts born in 1992 to 1996 (or 1992 to 1997 for age 14). In the second stage regression the dependent variable is a dummy variable of "being able to read". Both regressions include year (cohort), province, gender and mother and father educational categories fixed effects. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 2. 2SLS estimation of the impact of CT grant on writing abilities.

| 2SLS | Age 11 years | Age 14 years |
|---|---|---|
| | Write | |
| CT grant | 0.0289** | 0.097*** |
| | (0.0111) | (0.0091) |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Gender FE | YES | YES |
| Mother & Father education FE | YES | YES |
| Mean for writing ability | 0.8614 | 0.9598 |
| Observations | 6663 | 10894 |
| F-stat 1st SLS | 385.3901 | 246.4401 |
| R-squared 2nd SLS | 0.0788 | 0.0671 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from a 2SLS model. In the first stage equation the dependent variable is the probability of receiving the CT grant while the instrument is a dummy variable equal to 1 for the cohorts born in 1997 to 2001 (or 1998 to 2000 for age 14) and 0 for the cohorts born in 1992 to 1996 (or 1992 to 1997 for age 14). In the second stage regression the dependent variable is a dummy variable of "being able to write". Both regression include year (cohort), province and gender fixed effects. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 3. 2SLS estimation of the impact of CT grant on school attendance.

| 2SLS | Age 11 years | Age 14 years |
|---|---|---|
| | Attendance | |
| CT grant | 0.0020 | 0.0177** |
| | (0.0015) | (0.0071) |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Gender FE | YES | YES |
| Mother & Father education FE | YES | YES |
| Mean for attendance | 0.9759 | 0.9889 |
| Observations | 6663 | 10894 |
| F-stat 1st SLS | 253.1801 | 1023.6301 |
| R-squared 2nd SLS | 0.2672 | 0.1275 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from a 2SLS model. In the first stage equation the dependent variable is the probability of receiving the CT grant while the instrument is a dummy variable equal to 1 for the cohorts born in 1997 to 2001 (or 1998 to 2000 for age 14) and 0 for the cohorts born in 1992 to 1996 (or 1992 to 1997 for age 14). In the second stage regression the dependent variable is a dummy variable of "attending school". Both regressions include year (cohort), province, gender and mother and father educational categories fixed effect. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 4. 2SLS estimation of the impact of CT grant on reading abilities by gender.

| 2SLS | Boys | Girls |
|---|---|---|
| | Read: 11 years | |
| CT grant | 0.0388*** | 0.0175 |
| | (0.0164) | (0.0222) |
| | Read: 14 years | |
| CT grant | 0.0831*** | 0.0988*** |
| | (0.0114) | (0.0125) |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Mother & Father education FE | YES | YES |
| Mean for reading ability (11 years) | 0.8665 | 0.8865 |
| Mean for reading ability (14 years) | 0.9563 | 0.9218 |
| Observations | 8974 | 8583 |
| F-stat 1$^{st}$SLS (11 years) | 248.9101 | 154.1201 |
| R-squared 2$^{nd}$ SLS (11 years) | 0.0512 | 0.0499 |
| F-stat 1$^{st}$SLS (14 years) | 142.2801 | 117.9601 |
| R-squared 2$^{nd}$ SLS (14 years) | 0.0491 | 0.0493 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from two 2SLS models; one for boys and one for girls. In the first stage equation the dependent variable is the probability of receiving the CT grant while the instrument is a dummy variable equal to 1 for the cohorts born in 1997 to 2001 (or 1998 to 2000 for age 14) and 0 for the cohorts born in 1992 to 1996 (or 1992 to 1997 for age 14). In the second stage regression the dependent variable is a dummy variable of "being able to read". Both regressions include year (cohort), province, gender, mother and father educational categories fixed effect. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 5. 2SLS estimation of the impact of CT grant on writing abilities by gender.

| | Boys | Girls |
|---|---|---|
| | Write: 11 years | |
| CT grant | 0.0343***<br>(0.0170) | 0.0172<br>(0.0119) |
| | Write: 14 years | |
| CT grant | 0.0854***<br>(0.0118) | 0.0994***<br>(0.0127) |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Mother & Father education FE | YES | YES |
| Mean for writing ability (11 years) | 0.8488 | 0.8744 |
| Mean for writing ability (14 years) | 0.9562 | 0.9718 |
| Observations | 8974 | 8583 |
| F-stat 1st SLS (11 years) | 248.5901 | 154.1301 |
| R-squared 2nd SLS (11 years) | 0.0781 | 0.0779 |
| F-stat 1st SLS (14 years) | 142.7401 | 117.8501 |
| R-squared 2nd SLS (14 years) | 0.0681 | 0.0657 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from two 2SLS models; one for boys and one for girls. In the first stage equation the dependent variable is the probability of receiving the CT grant while the instrument is a dummy variable equal to 1 for the cohorts born in 1997 to 2001 (or 1998 to 2000 for age 14) and 0 for the cohorts born in 1992 to 1996 (or 1992 to 1997 for age 14). In the second stage regression the dependent variable is a dummy variable of "being able to write". Both regressions include year (cohort), province, gender mother and father educational categories fixed effect. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 6. 2SLS estimation of the impact of CT grant on school attendance by gender.

| | Boys | Girls |
|---|---|---|
| | Attendance: 11 years | |
| CT grant | 0.0030*** | 0.0024 |
| | (0.0012) | (0.0019) |
| | Attendance: 14 years | |
| CT grant | 0.0169*** | 0.0131*** |
| | (0.0083) | (0.0015) |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Mother & Father education FE | YES | YES |
| Mean for attendance (11years) | 0.9870 | 0.9908 |
| Mean for attendance (14years) | 0.9738 | 0.9781 |
| Observations | 14777 | 13999 |
| F-stat 1st SLS (11 years) | 145.9801 | 121.6401 |
| R-squared 2nd SLS (11 years) | 0.3049 | 0.2367 |
| F-stat 1st SLS (14 years) | 546.45 | 546.7101 |
| R-squared 2nd SLS (14 years) | 0.1885 | 0.1173 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from two 2SLS models; one for boys and one for girls. In the first stage equation the dependent variable is the probability of receiving the CT grant while the instrument is a dummy variable equal to 1 for the cohorts born in 1997 to 2001 (or 1998 to 2000 for age 14) and 0 for the cohorts born in 1992 to 1996 (or 1992 to 1997 for age 14). In the second stage regression the dependent variable is a dummy variable of "attending school". Both regressions include year (cohort), province, gender, mother and father educational categories fixed effect. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 7. 2SLS estimation of the impact of CT grant on parent's employment.

| | Male | Female |
|---|---|---|
| | Employment | |
| CT grant | 0.1588*** | 0.1564*** |
| | (0.0080) | (0.0080) |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Age FE | YES | YES |
| Mother & Father education FE | YES | YES |
| Mean for employment | 0.4561 | 0.4410 |
| Observations | 8134 | 7994 |
| F-stat 1$^{st}$SLS | 2301.3701 | 2255.3101 |
| R-squared 2$^{nd}$ SLS | 0.3614 | 0.3608 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from two 2SLS models; one for mothers and one for parents. In the first stage equation the dependent variable is the probability of receiving the CT grant while the instrument is a dummy variable equal to 1 for the cohorts born in 1997 to 2001 (or 1998 to 2000 for age 14) and 0 for the cohorts born in 1992 to 1996 (or 1992 to 1997 for age 14). In the second stage regression the dependent variable is a dummy variable of "being employed" for mothers/fathers of the affected children. Both regressions include year (cohort), province, gender mother and father educational categories fixed effect. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 8. 2SLS estimation of the impact of CTgrant on education outcomes of poor and rich provinces.

| 2SLS | Age 11 years | Age 14 years |
|---|---|---|
| Rich | Read | |
| CT grant | 0.0461*** | 0.0812*** |
| | (0.0156) | (0.0022) |
| Poor | Read | |
| CT grant | 0.0665*** | 0.0796*** |
| | (0.0241) | (0.0017) |
| Rich | Write | |
| CT grant | 0.0421*** | 0.0689*** |
| | (0.0177) | (0.0341) |
| Poor | Write | |
| CT grant | 0.0582*** | 0.0638*** |
| | (0.0103) | (0.0319) |
| Rich | Attendance | |
| CT grant | 0.0211 | 0.0298*** |
| | (0.0173) | (0.0143) |
| Poor | Attendance | |
| CT grant | 0.0381*** | 0.0253** |
| | (0.0151) | (0.0132) |
| Mean for reading ability rich | 0.8745 | 0.9689 |
| Mean for reading ability poor | 0.8781 | 0.9301 |
| Mean for writing ability rich | 0.8589 | 0.9638 |
| Mean for writing ability poor | 0.8627 | 0.9559 |
| Mean for attendance rich | 0.9868 | 0.9741 |
| Mean for attendance poor | 0.9902 | 0.9771 |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Gender FE | YES | YES |
| Mother & Father education FE | YES | YES |
| Observations | 6663 | 10894 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from two 2SLS models; one for rich and one for poor provinces. In the first stage equation the dependent variable is the probability of receiving the CT grant while the instrument is a dummy variable equal to 1 for the cohorts born in 1997 to 2001 (or 1998 to 2000 for age 14) and 0 for the cohorts born in 1992 to 1996 (or 1992 to 1997 for age 14). In the second stage regression the dependent variable is a dummy variable. Both regressions include year (cohort), province, gender, mother and father educational categories fixed effect. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

**Appendix**

Table 1A. OLS estimation showing the direct impact of CT grant receipt on education outcomes.

| OLS | Age 11 years | Age 14 years |
|---|---|---|
| | Read | |
| CT grant | 0.0574*** | 0.0818*** |
| | (0.0040) | (0.0053) |
| | Write | |
| CT grant | 0.0461*** | 0.0707*** |
| | (0.0042) | (0.0055) |
| | Attendance | |
| CT grant | 0.0101 | 0.0149*** |
| | (0.0341) | (0.0021) |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Gender FE | YES | YES |
| Mother & Father education FE | YES | YES |
| Mean for reading ability | 0.8764 | 0.9367 |
| Mean for writing ability | 0.8614 | 0.9598 |
| Mean for school attendance | 0.9759 | 0.9889 |
| Observations | 6663 | 10894 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from an OLS model. The dependent variable is the probability of "being able to read", "being able to write" and "attending school" and the independent variable "CT grant" is the self-reported variable that captures whether the child receives the cash transfer. We include the same cohorts than in the other models (cohorts born from 1992 to 2001, or to 2000 for age 14). The regressions include year (cohort), province, gender, mother and father educational categories fixed effect. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 2A. Reduce form estimates showing impact of the instrument directly on education outcomes.

| | Age 11 years | Age 14 years |
|---|---|---|
| | Read | |
| Treatment (Birth Cohort) | 0.0028*** | 0.0052*** |
| | (0.0008) | (0.0007) |
| | Write | |
| Treatment (Birth Cohort) | 0.0024*** | 0.0039*** |
| | (0.0008) | (0.0007) |
| | Attendance | |
| Treatment (Birth Cohort) | 0.0003 | 0.0010*** |
| | (0.0002) | (0.0003) |
| Year FE | YES | YES |
| Province FE | YES | YES |
| Gender FE | YES | YES |
| Mother & Father education FE | YES | YES |
| Mean for reading ability | 0.8764 | 0.9367 |
| Mean for writing ability | 0.8614 | 0.9598 |
| Mean for school attendance | 0.9759 | 0.9889 |
| Observations | 6663 | 10894 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from an OLS model. The dependent variable is the probability of "being able to read", "being able to write" and "attending school". The independent variable captures the likelihood of being treated depending on the cohort of birth which corresponds to the instrument used in the 2SLS models. This is a dummy variable equal to 1 for the cohorts born in 1997 to 2001 (or 1998 to 2000 for age 14) and 0 for the cohorts born in 1992 to 1996 (or 1992 to 1997 for age 14). The regression includes year (cohort), province, gender, mother and father educational categories fixed effect. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 3A. Robustness check tests (Placebo results).

| 2SLS | |
|---|---|
| | Read |
| Fake CT grant | 0.0510<br>(0.0301) |
| | Write |
| Fake CT grant | 0.0405<br>(0.0322) |
| | Attendance |
| Fake CT grant | -0.0006<br>(0.0255) |
| Year FE | YES |
| Province FE | YES |
| Gender FE | YES |
| Mother & Father education FE | YES |
| F-stats ( 1st SLS) | 18.4101 |
| Observations | 9374 |

***, **, * denote significant p value at <0.01, 0.05 and 0.1.Coefficients in brackets represent standard errors.

Note: The results are from a 2SLS model estimating the effects of a fake cash transfer program. We include only cohorts not treated by the real cash transfer program (born between 1992 and 1996) and consider as receiving the fake transfer program those cohorts born in 1994, 1995 and 1996. Therefore, we use as controls the cohorts born in 1992 and 1993. In the first stage equation the dependent variable is the probability of receiving this fake CT grant as defined by the cohort of birth explained above, while in the second stage regression the dependent variable is a dummy variable of “being able to read”, “being able to write” and “attending school”. As before, the regression includes year (cohort), province, gender, mother and father educational categories fixed effect. Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 4A. Descriptive statistics.

| | 11 years old | | 14 years old | |
|---|---|---|---|---|
| | Treated (cohorts 1997-2001) | Control (cohorts 1992-1996) | Treated (cohorts 1998-2000) | Control (1992-1997) |
| Receiving the CT | 56% | 1% | 57% | 1% |
| Female | 51% | 54% | 51% | 53% |
| In rich provinces | 45% | 55% | 45% | 55% |
| Able to Read | 88% | 85% | 96% | 86% |
| Able to Write | 86% | 83% | 96% | 86% |
| Attending School | 97% | 97% | 99% | 98% |
| Observations | 3336 | 3327 | 5347 | 5547 |

Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.

Table 5A. Description of the educational categories.

| | |
|---|---|
| 0 | No formal education |
| 1 | Grade 1 as highest educational degree |
| 2 | Grade 2 as highest educational degree |
| 3 | Grade 3 as highest educational degree |
| 4 | Grade 4 as highest educational degree |
| 5 | Grade 5 as highest educational degree |
| 6 | Grade 6 as highest educational degree |
| 7 | Grade 7 as highest educational degree |
| 8 | Grade 8 as highest educational degree |
| 9 | Grade 9 as highest educational degree |
| 10 | Grade 10 as highest educational degree |
| 11 | Grade 11 as highest educational degree |
| 12 | Grade 12 as highest educational degree |
| 13 | Grade 12 plus some post matric certificate as final education |
| 14 | Grade 12 plus N1 certificate as final education |
| 15 | Grade 12 plus N2 certificate as final education |
| 16 | Grade 12 plus N3 certificate as final education |
| 17 | Grade 12 plus N4 certificate as final education |
| 18 | Grade 12 plus N5 certificate as final education |
| 19 | Grade 12 plus N6 certificate as final education |
| 20 | Grade 12 plus higher certificate from Technikon as final education |
| 21 | Grade 12 plus diploma as final education |
| 22 | Grade 12 plus B-tech as final education |
| 23 | Grade 12 plus M-tech as final education |
| 24 | Grade 12 plus D tech certificate as final education |
| 25 | Grade 12 plus attended first year at University as final education |
| 26 | Grade 12 plus University Degree as final education |
| 27 | Grade 12 plus University Degree (Honours) as final education |
| 28 | Grade 12 plus University Masters Degree as final education |

| | |
|---|---|
| 29 | Grade 12 plus University Post Graduate Diploma as final education |
| 30 | Grade 12 plus University Doctoral Degree as final education. |

Source: General Household Survey (GHS), and Labour Force Survey (LFS) provided by Statistic South Africa from 1998 to 2014.