# Scaling-Up for Development Impact: The Economy-wide Effect of South Africa's Child Grant Program

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**Abstract**

South Africa has one of the largest social grants system in the developing world. The Child Support Grant (CSG) is one of its flagship programs. While a number of studies have looked at the program impact on beneficiaries, little has been done to evaluate its impact on society at large, particularly on non-beneficiaries. To fill this gap, this paper builds a novel analytical framework that combines the estimation and simulation techniques to assess the general equilibrium effect of the CSG. A state of the South African economy without beneficiaries of the CSG program is built to serve as a counterfactual scenario. Surprisingly, findings show small economywide poverty and inequality effects associated with the program in the short-run.

Keywords: Welfare Policy, Transfer Payments, Project Evaluation, Economywide Analysis.

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## 1. Introduction

Social grants scheme has become an important component of many developing countries' inclusive growth strategies with governments increasingly investing in large-scale cash transfer programs (The Department for International Development [DFID], 2011). South Africa has one of the largest cash transfer systems in Africa. In 2012/13, about 16 million individuals – 31% of the population – received a social grant in South Africa, compared to less than 3 million beneficiaries in 1998 (National Treasury, 2013). More than half of the households benefit from some form of social assistance with 22% relying on it as a main source of income. Social grants are considered an important instrument in fighting poverty in South Africa.

The social protection system defined within the fiscal framework has two separate but interrelated entities: social assistance (the grants system, through which the state provides basic minimum protection to relieve poverty) and social insurance (mandatory employee contribution schemes). The purpose of the social security programme is to tackle development issues such as poverty, vulnerability, social exclusion and inequality through a comprehensive social protection system. The system prevents vulnerability and destitution as a result of loss of income through offering social assistance.

Social assistance is provided in the form of social grants (for adults who are 18 years and older), child grants (for those younger than 18 years) and a special award or the social relief of distress grant. Social grants for adults are: old age grant, disability grant, war veterans' grant and grant-in aid. Social grants targeted to benefit children are: care-dependency grant, foster child grant and child support grant (CSG).

The literature on impact assessment of social grants is extensive. With respect to the empirical evidence, DFID (2011) notes that cash transfers are one of the more thoroughly researched forms of development intervention. Studies generally indicate that social grants, in particular the child grants, have positive impacts on recipients and households. Agüero et al. (2007) and Department of Social Development (DSD) et al. (2012) report short-run improvements in beneficiary children's health and nutrition associated with the South African CSG. Case et al. (2005), Yamauchi (2005) and Williams (2007) found positive

educational outcomes of the CSG in terms of reducing repetition in school, allowing for early schooling and reducing the probability of school-age children not attending school. The labour force participation of recipient mothers improves (Williams, 2007; Eyal and Woolard, 2011), and poverty indicators decline with access to the CSG (Haarmann, 2000; and Samson et al., 2004).

However, these studies on the impact of social grants in South Africa typically make a strong assumption that grants will have very little general equilibrium effects. As argued by Taylor and Filinski (2014), the standard Average Treatment effect on Treated (ATT) measure, used to assess the impact of development interventions, partially captures the full impact of projects or programs. The treatment entails direct and indirect effects on the treated group and indirect effect on the non-treated group. ATT provides a measure of the direct effect of a treatment by comparing the outcome between the treated and the control groups. By measuring the difference between the outcome of the treated group and that of the non-treated group, ATT cancels out the indirect effects on the two groups. The omitted indirect or general equilibrium effect of the intervention can be sizeable, particularly in the case of large-scale interventions. The general equilibrium effect can also be local or global. Taylor and Filinski (2014) provide a useful discussion of the local general equilibrium effect of development interventions. This study focuses on the global effect, also known as economywide effect.

The global effect can be important for the CSG given that it is the largest cash transfer program and one of the most important social protection instrument in South Africa. The successive expansion of the eligibility criteria (increase in the age limit from 7 to 18 years old) and the adjustment in the income threshold and its scale (R100 in 1998 to R280 in 2012) have significantly increased the program take-up. The program reached about 11 million children in 2012 receiving a monthly disbursement of R280 per child. The largeness of the scale of the CSG program makes it more likely to have an economywide impact and can potentially affect non-beneficiaries through the feedback or indirect effects.

The main hypothesis of this study is that the CSG has significant indirect effects on the South African economy through households' consumption and labour supply behaviours.

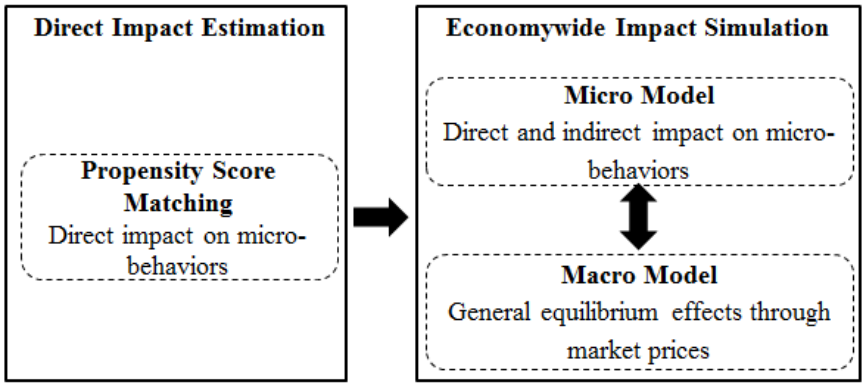
A state of the South African economy without beneficiaries of the CSG program is built to serve as a counterfactual scenario. The latter provides useful insights on the biases introduced by the CSG into the South African economy and enables assessment of the program overall impact.

The rest of the paper is organized as follows. Section 2 presents the analytical framework linking a direct impact estimation technique – propensity score matching – with an economywide impact simulation method – computable general equilibrium model. Section 3 compares and discusses results drawn from the counterfactual scenario against those from the reference scenario, i.e. the actual performance of the economy with the social grant scheme. Section 4 concludes the paper.

## 2. The Assessment Framework

An integrated analytical framework to assess the direct and indirect impact of the South African Child Support Grant (CSG) program is constructed. The framework combines two modeling techniques, namely the propensity score matching (PSM) technique and a macro–micro simulation model as depicted in Figure 1.

Figure 1
Simplified Presentation of the Analytical Framework



The PSM technique is used to assess the direct impact of the program on beneficiary households. It is applied to a nationally representative survey of beneficiary and non-beneficiary households of the population. The estimated score enables one to match beneficiary to non-beneficiary households in evaluating the direct impact of the program.

The outputs of the PSM estimation are then used as an input to a Computable General Equilibrium (CGE) model built to capture the (market) prices and income effects of the CSG program. Simultaneously, a counterfactual nationally representative sample of non-beneficiary households is generated with a non-parametric Micro-Simulation (MS) model and the PSM estimates. The MS model also captures the micro-behavioural changes in reaction to the economywide prices and income changes.

### 2.1. The Estimation Model

The impact of development interventions are estimated by comparing the outcome levels of the same household with and without the intervention at a given point of time. However, once the intervention is undertaken it is not possible to observe the two outcomes for a particular household at the same time. Randomized, econometric or matching techniques are used to estimate the Average Treatment effect on Treated (ATT) by comparing the outcomes of the beneficiaries group with the outcomes of a "quasi-identical" non-beneficiaries group, also known as control group (Taylor and Filipski, 2014). The average changes in outcomes between the beneficiaries and non-beneficiaries groups are interpreted as the direct impact of the intervention.

This study estimates the counterfactual consumption and labour supply behaviours of beneficiary households using the PSM technique. In other words, it seeks to gain insights of what would have happened to beneficiary households in the absence of the grant program. First, the review of the grant access information provides a background for the score estimation. Second, propensity scores are estimated for the beneficiaries and non-beneficiaries of the grants program. Third, the available matching techniques are used to evaluate the direct impact of the program and identify the simulation variables.

The framework is applied to the 2008 National Income Dynamic Survey (NIDS)[2] data. The survey was carried out across the country with a nationally representative sample of over 28,000 individuals in 7,300 households. It captures multiple dimensions of well-being indicators including questions related to access of eligible children and their caregiver to the CSG.

- *Grant Access Criteria*

The report by DSD et al. (2012) provides an exhaustive review of the access and eligibility criteria to the CSG and its evolution since the grant implementation in 1998. The grant access discussion is primarily based on the information provided by this report. According to the report, the main criteria of eligibility to the CSG are the age of the beneficiary; the income of the applicant (or caregiver, of the spouse or partner, and of the beneficiary); and the citizenship or the residency status of the applicant. Successive increases in the age threshold (7 to 18 years old) for CSG eligibility occurred throughout the period of implementation of the program (1998-2014). An active campaign of communication was organized to inform on the changes in the age threshold through letters, pamphlets, and road shows. Income is an important criterion for eligibility to the grant. The annual income threshold in 2012 was set to R32, 700 for a single caregiver and R70, 000 for a married caregiver and spouse. The employment status, in particular government employment, has been an important element of the application because of misperception of the eligibility criteria according to a recent report on CSG program (DSD et al., 2012). South African citizenship or permanent resident status of the applicant or caregiver is the third criterion. The status of the beneficiary does not determine the eligibility. According to the report, the main reasons cited by poor caregivers for not having applied for the CSG are lack of documents[3], lack of time, and income being too high. Refusal by fathers to support mothers' application for the grant on behalf of the child is also cited as a barrier to the grant

[2] The NIDS project is implemented by the Southern Africa Labor and Development Research Unit (SALDRU) based at the University of Cape Town's School of Economics.
[3] Parent identification document, child's birth certificate, child's clinic card, marriage certificate and proof of address.

access (DSD et al., 2012, p29). Misunderstanding of application processes such as the caregiver not being the child's mother, process being too time-consuming or costly, lack of past experience with social grant applications, are all cited as important barriers to applying. There is a high correlation between the CSG and other grants received as "Households receiving the Child Support Grant are more likely to receive another grant than households who receive no CSG" (DSD et al., 2012, p30). High transport costs reduce the likelihood of applying by rural caregivers. Being African and a female headed household increase the likelihood of receiving social grants as compared to other population group and male headed households according to Geldenhuys (2008). The author finds that households that receive grants tend to be larger than non-grant receiving households. Indicators such as the mean total dependency ratio, child dependency ratio and age dependency ratio were also found to be higher in grant recipient households than in non-grant recipient households. This was also the case for both the unemployed and the inactive ratios. However, the results show that school attendance ratios (ages 5–24) were significantly higher in the grant recipient population than amongst households not receiving grants according to Geldenhuys (2008).

- *Propensity Score Estimation*

The common methods of estimating the impact of programs are typically using social experiments, regression models, matching estimators, and instrumental variables. Although social experiments are gaining popularity especially because of the low cost of carrying them out in developing countries, most economic research still uses secondary data relying on a variety of statistical control strategies and/or natural experiments to reduce selection bias (Taylor and Filipski, 2014). The most commonly used statistical techniques in this context are regression, matching, and instrumental variables.[4]

The focus of this study is primarily on the matching estimators for two reasons. First, because treatment effects are constructed by matching individuals with the same covariates

[4] Selection bias arises from the fact that treated individuals differ from the non-treated for reasons other than treatment status per se (Taylor and Filipski, 2014). According to the authors, the three methods are relatively linked in practice.

instead of through a linear model for the effect of covariates, it fits well in the framework. Secondly, given the process of determining the eligibility of the CSG, it makes the assumption of conditional independence valid and amenable to the use of the matching estimator.[5]

The propensity score estimation is based on a model of probability of being a beneficiary of the CSG (T), conditional on household's observed covariates, (X).

$$P(X) = \Pr(T = 1 | X) \tag{1}$$

The model is specified over twenty-four variables (Table I in the appendix) of which the conditional independence and the sizable common support conditions are valid. The NIDS data are carefully handled and cleaned prior to their use in the PSM estimation.

- *Identification of Simulation Variables*

Matching techniques are used to assess the direct impact of the CSG program and, then select the relevant variables to be considered for the simulation experiment. First, a set of variables are pre-selected from the literature. The study only considers the behavioural variables that are likely to be affected by the CSG program in the short run.

Previous studies pay particular attention to the labour market participation and employment which are expected to be lower, and unemployment and self-employment in agriculture to be higher among the CSG beneficiary as compared to non-beneficiary households. The ratio of the number of employed household members to household size was substantially higher in non-grant receiving households than in households that receive some form of social grants (Geldenhuys, 2008). Furthermore, the ratio of the number of those unemployed to household size was found to be lowest for non-granted households according to the author. Altman and Boyce (2008) point out significant increases in the

[5] The conditional independence implies the selection of key variables that are more likely to affect participation but not the outcomes.

number of households engaged in personal subsistence agriculture activities – such as keeping chickens, growing vegetables, raising livestock – among the grant recipients.

According to Altman and Boyce (2008), grant recipients spend most of their expenditure on food with over half of the grant being spent on this commodity item. Both food items acquired through market transactions and own production increases with household access to the grant. Grant recipient payments for municipal services account for the second-largest grant expenditure item. Thus, food and municipal expenses are expected to be higher among beneficiary as compared to non-beneficiary households. According to Altman and Boyce (2008), grant recipients might have low levels of indebtedness with the common creditors being schools (17%) and the local authorities (13%). The scope of the NIDS survey does not permit a rigorous analysis of the saving behaviour of beneficiary as compared to non-beneficiary households

The available matching techniques are used to assess the direct impact of the CSG on the selected variables of interest, i.e. consumption expenses and labour supply.[6] We consider the impact of the CSG on nine (9) groups of consumption classified by purpose: food items; personal items; transport; energy, water and municipal services; household items; clothes and footwear; health; education; and miscellaneous. They are grouped according to the Classification of Individual Consumption by Purpose (COICOP). The analysis of the labour market participation and labour supply hours is categorized into six (6): wage and salary work; self-employment; personal agriculture activities; casual work; and assistance work to businesses.

After the propensity scores are estimated, the outcomes of the beneficiary households and those of the matched non-beneficiary households for the pre-selected consumption and labour supply variables are compared. The matching exercise aims at providing evidence that the CSG program affects the pre-selected variables of interest. Then, only variables

[6] Further discussion on the matching techniques is provided by (Khandker et al, 2009)

that show a statistically significant effect are included among the direct impact simulation variables.[7]

### 2.2. The Simulation Models

An integrated CGE and MS framework is built to simulate the economywide effects of the CSG program. The two models are linked in a recursive manner (also known as top-down/bottom-up) and designed to incorporate the outcomes of the PSM estimation. Thus, the labour supply and consumption behaviours are assessed by the MS model and used as input by the CGE model. In turn, changes in incomes and unemployment rates are assessed by the CGE model and used as input by the MS model.

- *The CGE Model*

A CGE model is built with exogenous labour supplies and a linear expenditure system specifying households' consumption behaviour. Consumption behaviour is modeled in two steps. First, the MS model determines the consumption levels by purpose (e.g. food; personal; transport; health; education; etc.). In a second step, the CGE model specifies a linear expenditure system to generate the consumption levels for various categories of products (e.g. agriculture, petroleum, furniture, etc.). The supplies of labour by households are exogenous while the demands by industries are determined through an imperfect substitute relationship between labour and capital, on the one hand and production factors and market products on the other. Three categories of workers are specified, namely private farmer, private non-farmer, and public or civil servant. While salary and wage rates paid by the public sector are exogenous in real terms (indexed by the average price level), labour compensations are determined by the market for the other two categories. The model identifies two labour markets: agricultural or rural, and non-agricultural or urban. Full employment and clearing wage rate is assumed for the agricultural market while imperfect market assumption holds for the urban market. Urban labour market features an excess supply of labour with an appearance of unemployment. A wage-curve relationship is

[7] Although not considered in this analysis, other variables such as child education and nutrition can show strong economywide effects in the long run.

specified between the wage and unemployment rates as first proposed by Blanchflower and Oswald (1994) and applied to South African labour market by Kingdon and Knight (2006).

The counterfactual scenarios are simulated by the CGE model through exogenous shocks on the labour supply and consumption grouped by purpose. Household's endogenous income and exogenous spending balance through adjustment of the marginal saving rate. Government budget is neutral; its income and spending balance through a compensatory tax on household gross income. The model is saving driven and free lunch between current and future generations is not canceled out.[8]

- *The Micro-Simulation Model*

The Micro-simulation (MS) model assesses the distributional impact among households of the social grant shock. The method builds upon the non-behavioural approach which consists of adjusting the surveyed household weights to create consistency between the macro and the micro outputs. The method does not allow households to adjust their behaviour in response to the shock. However, households change their behaviour by moving across the individual households categories covered by the survey.

Under additional information provided by the CGE model, household weights in the survey are readjusted using the cross-entropy estimation procedure (Golan et al, 1996). The approach minimizes the Kullback-Leibler cross-entropy measure of the distance between the sets of initial ($x$) and final ($y$) surveyed household weights transformed into probability measures.

$$\text{Min} \sum_{h=1}^{n} y_h \cdot \ln \frac{y_h}{x_h} \tag{2}$$

Subject to a consistency with the additional information

$$A_j = \sum_{h=1}^{n} y_h \cdot a_{h,j} \tag{3}$$

[8] Free lunch occurs when savings fall (increase) in current period at the expense (to the benefit) of future generations.

The constraint equations ($j$) include the adding-up normalization, unemployment rate, agricultural labour earning, nonagricultural labour earning, and capital earning. $A_j$ are simulated average changes of macro data that are consistent with the set of final weights. The counterfactual sample of (non-beneficiary) households is used in the MS model.

The sample of non-beneficiary households is built up from the initial NIDS data. The cross-entropy method is used to adjust the weight of non-beneficiary households on the basis of differences in consumption and labour supply outcomes generated by the PSM estimation.[9]

The poverty impact is assessed using the Foster et al., (1984) measure of poverty (FGT). The measure of inequality indicators uses the Theil index (Theil, 1967). Three datasets are used for the poverty and inequality analysis: the 2008 NIDS data that includes 7301 individual households (Real Sample); the sample of non-beneficiary households, i.e. the initial 7300 households less the 2795 beneficiaries of the CSG with adjusted weights (Counterfactual Sample); and the reweighted counterfactual sample consistent with the CGE simulation results (Simulation Sample). FGT Poverty indexes (headcount, gap, and severity) are computed for each of the three samples given a poverty line of $2/Day or R260 /Month (Leibbrandt et al., 2010; p.17). Theil inequality measures are also calculated using the average per capita consumption expenses in each sample.

## 3. Results and Discussion

The economywide effect of the South African child grants program are assessed in two steps. First, direct impacts on beneficiaries are estimated using the PSM method. In the second step, the macro-micro simulation model is used to evaluate the second order effects of the (labour supply and consumption) behavioural changes related to the CSG program.

- *Direct Impact Estimation*

The Kernel density distribution function of the beneficiary and non-beneficiary households resulting from the score estimation identifies a large common support with eight blocks

[9] These constraints are expected to insure the satisfaction of the balancing condition within the common support block.

that satisfy the balancing property (Figure I and table I in the annex). The available matching methods[10] are implemented to provide evidence that the program affects the pre-selected variables of interest. However, only variables showing a statistically significant difference in outcomes between the beneficiary households and their matched non-beneficiary households are included in the simulation exercise of step 2.

Among the eight categories of consumption by purpose, only the monthly per capita spending on "*electricity, water, and municipal services*", and "*clothes and footwear*" show statistically significant differences between beneficiary and non-beneficiary households (Table 1). Altman and Boyce (2008) also find significant effects of social grants on payments for municipal services.

Recipients of child grants also reduce their supplies of labour in terms of annual number of hours worked (Table 2). On the contrary, members of households eligible for child grants are more likely to perform agriculture as income from that activity may not necessarily count towards CSG eligibility. This provides extra income for the household without being disqualified for child grants. The decline in the labour supply is also documented by Geldenhuys (2008) and Altman and Boyce (2008).

Table 1

Difference in Average Monthly Consumption between Beneficiary and Non-Beneficiary Households (Rand)

| Category of consumption | Nearest Neighbor | | Stratification | | Radius | | Kernel | |
|---|---|---|---|---|---|---|---|---|
| Electricity, water, and municipal services | 12.6 | *** | 11.0 | *** | 12.0 | *** | 12.0 | *** |
| Clothes and footwear | 12.2 | | 10.5 | ** | 12.0 | *** | 10.8 | *** |

**Source:** Authors, from the estimation results.
Note: Statistical significant: ** 5 percent; *** 1 percent.

Table 2

Difference in Average Annual Hours Worked between Beneficiary and Non-Beneficiary Households

[10] Nearest neighborhood, stratification, radius, and kernel.

| Category of worker | Nearest Neighbor | | Stratification | | Radius | | Kernel | |
|---|---|---|---|---|---|---|---|---|
| Non-agricultural wage | -75.4 | | -99.9 | * | -100.6 | * | -100.0 | ** |
| Subsistence agricultural | 7.0 | * | 6.1 | * | 5.1 | | 6.3 | * |

**Source:** Authors, from the estimation results.
Note: Statistical significant: * 10 percent, ** 5 percent.

The PSM estimation highlights changes in households' consumption and labour supply behaviours when they have access to the grants program. The estimate identifies four pre-selected variables that the program impacted and on which the simulation scenario is built around, based on the Kernel matching technique (Tables 1 and 2). Results appear to be more robust with the Kernel method among the four matching methods used. The findings on households' consumption and labour supply variables are implemented on the CGE and MS models. The counterfactual scenario – i.e. the state of the economy without child grants program – eliminates the estimated direct impact of the program in the economy (ex-post simulation).

A state of the South African economy without the CSG program means less transfer spending towards households and more income for the Government. The CSG program covers 10.8 million children receiving R280 every month as of April 2012 (DSD et al., 2012). The cost of the CSG program was estimated around R37 billion in 2011 representing 24% of the total social protection spending (Figure II in the annexure). This implies cutting-off Government spending towards households in the CGE model, and replacing CSG beneficiaries with their matched non-beneficiaries in the MS model. A hypothetical sample of non-beneficiary households is generated with a new set of weights consistent with the PSM estimates.

The experiment is implemented under a tax-neutral funding assumption, i.e. the CSG program is financed from all tax sources. Thus, a lower economywide average tax rate would have been observed in a state of the economy without the CSG program. Then, the cut-off of the CSG program generates an extra-income for the Government which is in turn

spent through a tax rebate. The latter is implemented at an endogenous uniform-rate and applied to taxes on households and firms, production, imports, and sales.[11]

- *Indirect Impact Simulation*

Figure 2 depicts the computed poverty and inequality indexes for the reference and counterfactual scenarios.[12] The latter include the analysis of the direct and total (direct and indirect) effects of the CSG phase out.

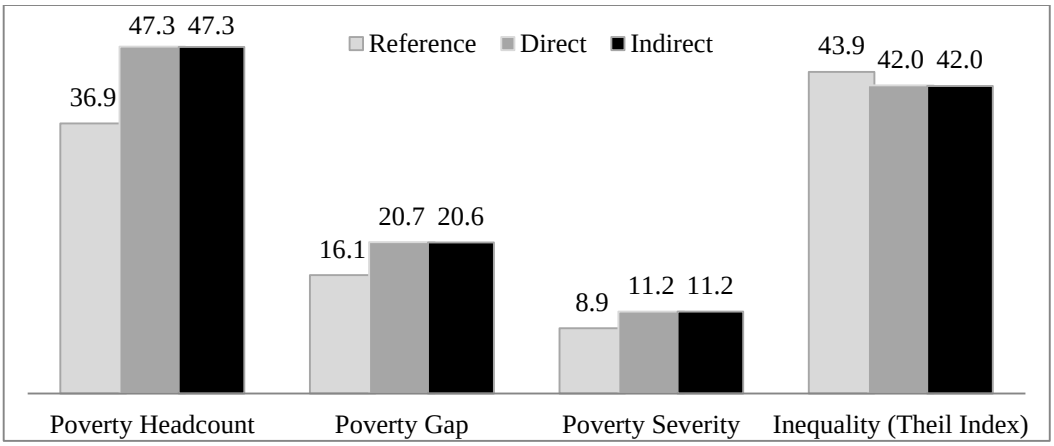
The reference scenario computes the indices using the nationally representative sample of households (Real sample). The counterfactual sample is used to estimate the direct impact of the CSG program. The CSG program has contributed directly to reducing poverty as poverty indexes are lower in the real sample compared to the counterfactual sample. To the contrary, Theil index is higher in the real sample compared to the counterfactual sample. That is, inequality is slightly higher under the CSG program.

Comparing results of the simulation sample to those of the counterfactual sample provides the indirect or economywide impact of the grants program. Results do not show significant indirect effects of the CSG program as poverty and inequality indices are very close for the two simulation scenarios (Figure 2).

[11] Tax revenues contributed 92.7% of Government budget in 2011.
[12] The per capita monthly consumption spending of R260 is used as the poverty line (Leibbrandt et al., 2010; p.17).

Figure 2

Changes in Poverty and Inequality Indexes (percent)




**Source**: Authors, from the simulation results

The analysis does not show a major change in economic performance measured by the level of gross domestic product (GDP). Specifically, GDP variation is small (0.1 percent) under the counterfactual scenario - i.e. absence of the CSG program - compared to the reference scenario (Table 3). The decline in private final consumption (-0.8 percent) is compensated for by high saving and investment (3.2 percent).

Table 3

Changes in Macro Variables (Percent)

| | GDP | Public Final Consumption | Private Final Consumption | Fixed Capital Formation | Change in Inventories | Exports | Imports |
|---|---|---|---|---|---|---|---|
| Share | 100.0 | 19.5 | 64.6 | 16.8 | 1.2 | 24.5 | 26.4 |
| Change | 0.1 | 0.0 | -0.8 | 3.2 | 0.0 | 0.3 | 0.3 |

**Source**: Authors, from the simulation results

The decline in households' consumption (Table 4) is driven by an income reduction (-0.4 percent) induced by less transfers from Government (-0.8 percent) and less remuneration of nonagricultural labour (-0.9 percent). Under the counterfactual scenario, increasing supply of nonagricultural wage labour put more pressure on the unemployment rate

(increase by 4.6 percentage points) and the nonagricultural wage rate (decrease by 1.4 percent) (Table 5).

Table 4

Household Income and Consumption Effects (Percent)

| | Public Employment Earning | Agricultural Employment Earning | Nonagricultural Employment Earning | Capital Earning | Transfer Income | All Income |
|---|---|---|---|---|---|---|
| Share | 15.1 | 1.0 | 42.0 | 1.6 | 25.4 | 100 |
| Change | 0.1 | -0.8 | -0.9 | 1.2 | -0.8 | -0.4 |

**Source**: Authors, from the simulation results

Table 5

Labor Supply, Unemployment, and Factor Prices (Percent)

| | Labor Supply | Unemployment rate* | Wage Rates | Return to Capital | Value Added | |
|---|---|---|---|---|---|---|
| | | | | | Change | Share |
| Agriculture | 2.0 | - | -2.7 | 5.5 | 0.6 | 2.7 |
| Non agriculture | 7.8 | 4.6 | -1.4 | 1.1 | 0.1 | 82.3 |
| Public | 0.0 | - | 0.0 | 0.0 | 0.0 | 15.0 |
| All Sectors | 6.2 | - | -1.1 | 1.4 | 0.1 | 100.0 |

**Source**: Authors, from the simulation results
**Note**: * Percentage point

The simulation results do not show a significant change in the average price level when comparing the counterfactual and the reference scenarios (Table 6). Thus consumer prices index stagnates (-0.1 percent) as the increase in agricultural and food prices is compensated for by the fall in nonfood manufactured goods and services. Higher prices for agriculture

and food products are observed due to the decline in households' subsistence agriculture activities and, consequently, an increase of the demand for marketed food. On the other hand, the decline in prices of nonfood manufactured goods and services is due to the positive production response to higher labour supply and, consequently, lower wage rates.

Table 6

Price effects between the counterfactual and reference scenarios (percent)

| **Category of products** | **Price variation** | **Distributive share** |
|---|---|---|
| Agriculture | 0.9 | 2.9 |
| Manufactured food | 0.8 | 11.1 |
| Weaving & finishing of fabrics | -1.5 | 4.6 |
| Electricity, water and municipal services | -0.4 | 1.9 |
| Other manufactured goods | -0.2 | 22.3 |
| Services | -0.1 | 57.3 |
| **All products** | **-0.1** | **100.0** |

**Source**: Authors, from the simulation results

## 4. Conclusion

Comprehensive social security programs such as the Child Support Grants are introduced to serve as safety nets to the poor in South Africa. While a number of studies have looked at the impact of the program on the beneficiaries, no research has been done on the impact of the program on the society at large, particularly on non-beneficiaries. This becomes important as the size of the program continues to increase.

To our knowledge, this study is the first to assess the general equilibrium effect of social grants by using an analytical framework that combines both estimation and simulation techniques. The analytical framework builds up counterfactual scenarios from a direct impact estimation method which are fed into a combined macro-micro model to simulate the indirect impact of the program on outcomes of interest such as poverty and inequality. Changes in other variables such as unemployment and wage rates, incomes, and price indexes are also tracked by the simulation model.

The results show direct differences between the beneficiaries and matched non-beneficiaries of the program in terms of their observed outcomes. Beneficiaries of the program increase their supply of labour for agricultural activities while reducing their participation to nonagricultural activities. There is also strong evidence that beneficiaries of the CSG consume more clothes and footwear, and energy, water and municipal services relative to if they were not beneficiaries.

Looking at the economywide results, no significant impacts of the grant program on economic performance measured by the level of GDP was found. Indeed, a small decline in GDP is observed due to the fall in private investment under higher tax pressure to finance the grants program. The increase in private final consumption partially covers the negative saving-investment outcome. Poverty index and inequality are also shown to decline as a direct result of the program.

There is an increase in private final consumption attributed to increases in income as a result of more transfers from government and higher nonagricultural labour income - lower employment and higher wage rates. The corresponding rise in agricultural self-employment and production does not have a sizeable impact on economic performance. The related lower prices of agricultural goods are compensated for by higher prices of nonagricultural products under a less taxed economy.

Overall, the findings highlight short-run poverty reduction and rising inequality outcomes associated with the child grants program in South Africa. No significant economywide general equilibrium effects of the program are found although the long-run economic and social impacts seem to be more promising with the evidence of positive impact of the program on children's education, health, and nutrition.

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**Annex: Other tables and Figures**

**Table I: Variables used in the Propensity Score Estimation**

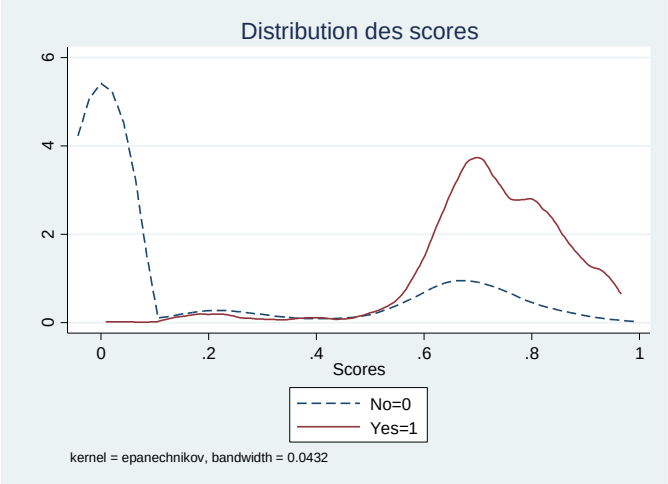
| Variables | Observation | Modalities |
|---|---|---|
| 1. Recipient of CSG | 5,392 | Not applicable (0)<br>Yes (1)<br>No (2) |
| 2. Presence of children less than 14 years old** | 5,392 | Not applicable (0)<br>Yes (1)<br>No (2) |
| 3. Presence of children less than 7 years old | 5,392 | Not applicable (0)<br>Yes (1)<br>No (2) |
| 4. Child has birthday certificate | 5,392 | Not applicable (0)<br>Yes (1)<br>No (2) |
| 5. Clinic card | 5,392 | Not applicable (0)<br>Yes (1)<br>No (2) |
| 6. Source of information for the child's date of birth | 5,392 | Not applicable (0)<br>Card (1)<br>Recall (2) |
| 7. Child living with a parent | 5,392 | Not applicable (0)<br>Yes (1)<br>No (2) |
| 8. Caregiver | 5,392 | Not applicable (0)<br>Parent (1)<br>Great, Grand Parent (2)<br>Others (3) |
| 9. Recipient of grant (excluding CSG)*** | 5,392 | No (0)<br>Yes (1) |
| 10. Household size* | 5,392 | 1-26 |
| 11. Number of children less than 14 years old | 5,392 | 0-13 |
| 12. Number of children less than 7 years old | 5,392 | 0-8 |
| 13. Population group*** | 5,392 | African (1)<br>Colored (2)<br>Asian (3)<br>White (4) |
| 14. Average household age | 5,392 | 7-99 |
| 15. Average household education level | 5,392 | 0-25 |

**Table I: Variables used in the Propensity Score Estimation (continue)**

| | | |
|---|---|---|
| 16. Gender of household head | 5,392 | Female (0)<br>Male (1) |
| 17. Number of year of education of household head | 5,392 | 0-25 |
| 18. Age of household head, number of year | 5,392 | Not applicable (0)<br>15-99 |
| 19. Marital status of household head | 5,392 | Never Married (0)<br>Married (1)<br>Living with partner (2)<br>Widow/Widower (3)<br>Divorced/Separated (4) |
| 20. Type of dwelling | 5,392 | Other (0)<br>Dwelling/house or brick structure (1)<br>Traditional dwelling/hut (2)<br>Flat/apartment/semi-detached house (3) |
| 21. Number of room | 5,392 | 1 room (1)<br>2 rooms (2)<br>3 rooms (3)<br>4 rooms (4)<br>5 rooms (5)<br>6 rooms (6)<br>More than 7 rooms (7) |
| 22. Distance of water source | 5,392 | Not applicable/Water on site (0)<br>Less than 100m (1)<br>100m - less than 200m (2)<br>200m - less than 500m (3)<br>500m - less than 1km (4)<br>1km and more (5) |
| 23. Access to electricity | 5,392 | No (0)<br>Yes (1) |
| 24. Existence of street lighting near dwelling** | 5,392 | No (0)<br>Yes (1) |
| 25. Time to reach the public transport services* | 5,392 | Not applicable (0)<br>Less than 5 minutes (1)<br>5 to 10 minutes (2)<br>10 to 15 minutes (3)<br>15 to 20 minutes (4)<br>20 to 25 minutes (5)<br>25 to 30 minutes (6)<br>More than 30 minutes (7) |

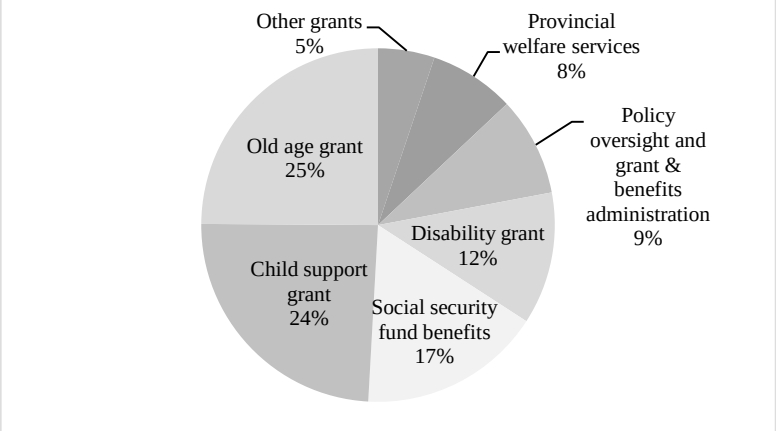
**Source**: Authors, from the PSM estimation.
**Note**: * legislators, senior officials, managers, and professionals, technicians and associate professionals; ** clerks, service workers, skilled agriculture workers, craft and trade workers, and plant and machinery workers, *** elementary occupations.

**Figure I: Kernel density function of the PSM**




Source: Authors, from the estimation results.
Note: No = Not a recipient of CSG; Yes= Recipient of CSG

**Figure II: Share of CSG in the Social Protection Spending for 2011**




**Source**: National Treasury (2011)

**Table II: Common support block**

| Inferior Score | Non-beneficiary households | Beneficiary households | All households |
|---|---|---|---|
| 0.009 | 96 | 35 | 131 |
| 0.200 | 175 | 64 | 239 |
| 0.400 | 186 | 264 | 450 |
| 0.600 | 501 | 851 | 1352 |
| 0.700 | 220 | 477 | 697 |
| 0.750 | 121 | 352 | 473 |
| 0.800 | 139 | 566 | 705 |
| 0.900 | 20 | 186 | 206 |
| **Total** | **1458** | **2795** | **4253** |

Source: Authors, from the estimation results.