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ANALYSIS OF THE ECONOMIC IMPACTS OF THE SOUTH AFRICAN CHILD SUPPORT GRANT VIA A MICROSIMULATION-CGE MODEL

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Authors:
Margaret Chitiga[a]
Luca Tiberti[b]
Helene Maisonnave[b],
Stephane Hoareau[c]
Véronique Robichaud[b]
Ramos Mabugu[d] and
Stewart Ngandu[a]

Contact Person:
Prof. Margaret Chitiga-Mabugu
Executive Director
Economic Performance and Development (EPD)
mchitiga@hsrc.ac.za
Tel: 012 302 2406

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[a] HSRC, South Africa, [b] Laval University, CIRPEE and PEP network, Canada, [c] Laval University, CIRPEE, Canada and [d] Financial and Fiscal Commission, South Africa

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1 INTRODUCTION, MOTIVATION AND OBJECTIVES

The Child Support Grant (CSG) was introduced in April 1998 in South Africa to replace the child maintenance grant. It currently is the most important form of assistance for children in poor families. These grants are paid to the primary caregivers of children.[1] Since 1 April 2010, the child support grant amounts to R250 per month, and the number of beneficiaries reached an estimated 9 424 281 on 28 February 2010 (National Treasury, 2010: 103, 105).

The CSG has been expanded greatly in recent years, and is particularly aimed at children in poor families. It offers a potential source of protection against poverty for poor children. It is generally agreed in South Africa that the CSG has contributed to reducing poverty as well as shielding children from adverse effects, particularly from the financial and economic crisis of 2008 and 2009 (Van der Berg 2007, Chitiga *et al* 2010 and Ngandu *et al* 2010).

The CSG was only available to children aged 0-13 years up to 2008 and was extended to include children aged 14 years from 2009 and 18 years from 2010 (SASSA 2010). Between 2002 and 2005 social transfers (grants) per capita increased by about R500. Over the same period, there was a decline in the number of children whose parents reported that they have gone hungry in the previous year, from 31% in 2002 to 23% in 2005 (Van der Berg). This decline is attributed to the expansion of social grants, in particular the child support grant. According to the Department of Social Development (2011), 2007 figures indicate that there was a 9% drop in child poverty because of the CSG. The Department of Social Development (2011) acknowledges that not all children eligible for the CSG are receiving it, citing lack of documentation as the biggest barrier. In 2008, 2.1 million children or 27% of those eligible for the CSG did not receive it (Department of Social Development 2011).

According to the terms of reference (ToR), the UNICEF/FAO team has identified several documented channels for the household-level impacts of social grants: (1) changes in labour supply of different household members, (2) investments of some part of the funds into productive activities that increase the beneficiary household's revenue generation capacity, and (3) prevention of detrimental risk-coping strategies such as distress sales of productive assets, children school drop-out, and increased risky income-generation activities such as commercial sex, begging and theft. Research has also documented three types of local economy impacts: (4) transfers between beneficiary and ineligible households, (5) effects on local goods and labour markets and (6) multiplier effects on income and/or welfare. This project seeks to analyse the economy wide effects and specifically the child welfare implications of social grants in South Africa.

The focus of this study is on the last of these channels. The rest of the paper is structured as follows: Section 2 discusses the Child Support Grant in South Africa. Section 3 briefly reviews

[1] Child support grants initially benefitted children under the age of seven years, but the coverage of the programme was expanded gradually and the grant is being rolled out poor children up to the age of 18 over the next three years (National Treasury, 2010a: 104).

literature on the impact of social transfers, while section 4 discusses the methodology and data used for this study. Section 5 discusses the results and section 6 concludes the paper.

2 Child Support Grant Background

2.1 About the Child Support Grant

The principles informing the establishment of the CSG were that it would be non-contributory, means tested and would follow the child regardless of who the caregiver was. The underlying assumption was that the person claiming the grant on behalf of the child would be the primary caregiver. It was also understood that the CSG would constitute part of broader poverty relief measures being adopted by the state. The adoption of the CSG contributed to South Africa's progressive realisation of the constitutional right to social security as enshrined in article 27 of the RSA Constitution (1996).

Although the Lund Committee proposed a universal CSG for children under 7 years, the state introduced the means test which has been progressively revised since 1998. The means test was designed to reach children in poorer households based on household income and differentiated between urban and rural households. In 1998 at the time of the grants introduction the means test level was as follows:

- Urban household income not exceeding R800 per month
- Rural household income not exceeding R1100 per month.

The means test threshold which was maintained for 10 years was subsequently revised in 2008 and as at 2010 a single parent earning R 2500 per month or less and for married persons earning a joint income of R 5000 per month would qualify to access the CSG. (South African Social Security Agency, 2011). The formula for determining the income threshold for the child support grant is A = B * 10, where A is the income threshold and B the monthly value of the grant. Hence, the income threshold now amounts to R2 500 per month for single caregivers and R5 000 per month for married caregivers (R30 000 per *annum* and R60 000 per *annum*, respectively).

The powers to increase the age limit was delegated to the Minister of the Department of Social Development (DSD) and progressively since 2003 decisions have been taken to extend the CSG age in phases as Table 1 illustrates.

Table 1: Changes in Age Eligibility and Grant Value Progression of the CSG

Year	Age Eligibility	Grant Amount
1998 – 2000	Children under 7 years	R 100
2001	Children under 7 years	R 110
2002	Children under 7 years	R140
2003	Children under 9 years	R 160
2004	Children under 11 years	R 170
2005	Children under 14 years	R 180
2008	Children under 15 years	?
2010	Children under 16 years	?
2011	Children under 17 years	R 270
2012	Children under 18 years	R 280

Source: Eyal et al (2011)

As Table 1 indicates the CSG value has also increased gradually over time to its current modest value of R 280 per month. In 2003 the grant was extended to children below the age of 11 years and in 2005 a phased extension up to 14 years was adopted. In 2007 this was finally extended to all children under 18 years.

The *"follow the child"* concept adopted for the implementation of the CSG is unique in that it recognized the varied and fluid nature of the family structure in South Africa and instead of linking the grant to a biological parent it allows the grant to be accessed by a primary caregiver. The primary caregiver is defined as anyone older than 16 years who is taking primary responsibility for the day to day needs of that child whether parent, relative or unrelated carer. (Patel et al, 2011).

2.2 Reach of the CSG

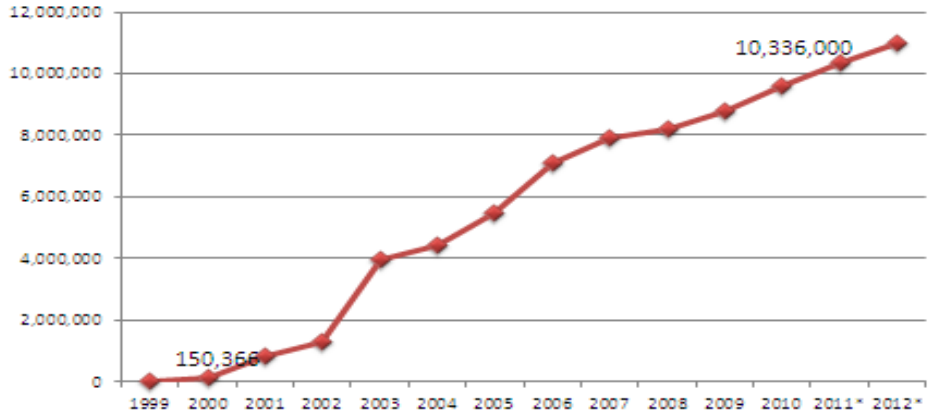
At the time of its introduction the declared goal was for the CSG to reach 3 million children within 5 years. Fourteen years later the CSG has expanded rapidly with over 10 million beneficiaries, (SASSA, 2011), making it the largest social assistance programme in South Africa and one of the largest globally. It has also been noted as one of the most rapidly growing grants in South Africa, recording a 1.8% growth as compared with Old Age Pension growth rate of 1.02% and with all other grants reflecting negative growth trends (SASSA, 2010), as seen in Table 2, below, with Figure 1, illustrating the growth of the CSG.

Table 2: Social grants beneficiary numbers by type and province, 2007/08 – 2013/14 in 000's

Type of grant	2007/08	2008/09	2009/10	2010/11[1]	2011/12 Projections	2012/13	2013/14	% Growth r per yea
Old-age	2,219	2,344	2,490	2,647	2,729	2,786	2,844	4.20%
War veterans	2	2	1	1	1	1	1	17.70%
Disability	1,413	1,372	1,299	1,233	1,265	1,290	1,315	-1.20%
Foster care	443	476	489	554	613	709	820	10.80%
Care dependency	102	107	119	121	128	135	141	5.60%
Child support	8,196	8,765	9,381	10,336	10,977	11,303	11,589	5.90%
Total	**12,375**	**13,066**	**13,779**	**14,892**	**15,713**	**16,223**	**16,709**	**5.10%**
Province								
Eastern Cape	2,292	2,347	2,416	2,569	2,738	2,797	2,847	3.70%
Free State	756	766	806	895	927	957	987	4.50%
Gauteng	1,452	1,538	1,702	1,842	1,917	1,993	2,092	6.30%
KwaZulu-Natal	3,033	3,317	3,454	3,692	3,868	4,004	4,130	5.30%
Limpopo	1,799	1,894	1,974	2,140	2,299	2,336	2,379	4.80%
Mpumalanga	925	978	1,009	1,072	1,159	1,181	1,201	4.40%
Northern Cape	307	327	348	388	413	436	454	6.80%
North West	980	1,015	1,071	1,137	1,170	1,210	1,236	3.90%
Western Cape	831	886	997	1,156	1,222	1,308	1,383	8.90%
Total	**12,375**	**13,066**	**13,779**	**14,892**	**15,713**	**16,223**	**16,709**	**5.10%**

Source: National Budget Review (2011)
1. Projected numbers at fiscal year-end.

Figure 1: Growth of the Child Support Grant 1999-2012



Source: Laryea-Adjei, G. et al (2011)

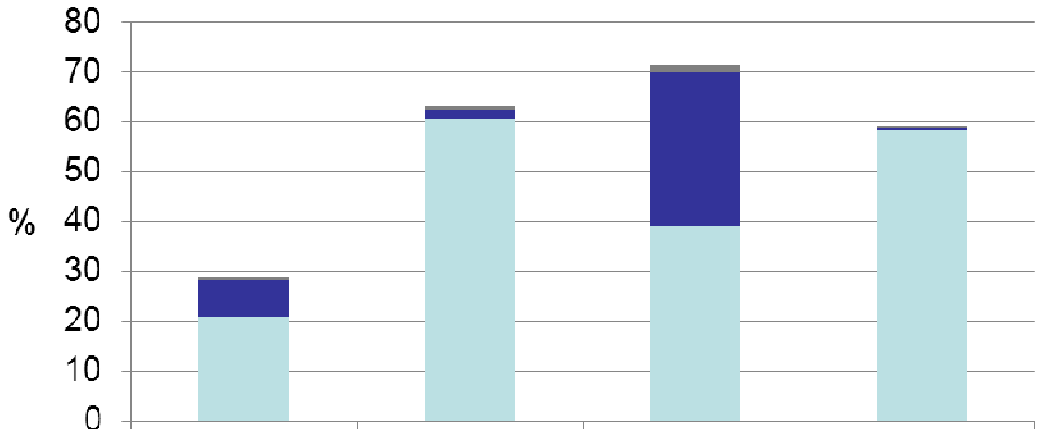
This growth occurred despite many initial challenges with the implementation of the CSG, these included the lack of equipment in many offices, under staffing of welfare offices, lack of uniformity in the application process across provinces and offices as well as problems with accessing vital registration documents (for example, identity documents and birth certificates). Some applicants also experienced difficulties in providing postal addresses (Eyal et al (2011).

The profile of caregivers receiving the CSG reflects some interesting patterns according to the 2008 National Income Dynamic Study (NIDS). The majority (82%) of child grants, were being accessed by one of the child's parents (mainly the mother), followed by grandparents (12%), other relatives (3%) and unrelated caregivers (2%). The NIDS data also revealed that 10% of the recipient caregivers were not co-resident with the child. Over 92% of all caregivers accessing the CSG are female, less than 2% of grant beneficiaries are teenagers while one third of caregivers are in their 30s and 15% are over 50 years of age (McEwan et al, 2010).

The NIDS 2008 study also found that 41% of recipient mothers are married or living with their partner, 50% had never married and approximately 8% were either widowed or divorced. 64% of recipient mothers only received the CSG in respect of 1 child, 27% received for 2 children, 7% for 3 children and the remaining 2% were in receipt of the CSG for between 4 and 6 children. (Eyal et al, 2011). A more recent though smaller study undertaken in Soweto (Patel et al, 2012), also revealed that just over half of the CSG recipients (54.3%) received the grant via a bank account, while 45.7% collected the grant at a South African Social Security Agency (SASSA) pay point.

Trends emerging from the NIDS 2008 data regarding income eligible children not accessing the CSG reveal that there are currently more than 600,000 maternal orphans not receiving any grant, a vastly higher proportion than for any other group. In addition, disproportionately fewer younger children 0-2 years as well as fewer rural children are accessing the CSG (McEwan et al, 2010).

Figure 2: Orphanhood and Grant Receipt



	Maternal orphan	Paternal orphan	Dual orphan	Not an orphan
CDG	0.3	0.7	1.4	0.4
FCG	7.6	1.7	30.9	0.5
CSG	20.7	60.7	39.1	58.2

Key: CDG - Care Dependence Grant; FCG – Foster Care Grant; CSG – Child Support Grant

Source: Woolard et al (2009)

Table 3 indicates that KwaZulu-Natal and Eastern Cape have the highest number of children who are benefiting from the CSG with children under 7 years being the largest age group of CSG beneficiaries. The figures for these two provinces in particular demonstrate the ability of the CSG to reach large numbers of poor children, including those living in deep rural areas.

Table 3: Number of Child Support Grants by age and province as at 30 June 2011

Ages	EC	FS	GAU	KZN	LIM	MPU	NW	NC	WC	Total
(0-1 yrs)	74,455	30,236	66,160	113,815	73,040	37,870	28,969	11,708	35,164	**471,417**
(1-2 yrs)	99,812	39,511	92,978	156,402	95,599	57,607	45,572	16,622	52,055	**656,158**
(2-3 yrs)	108,824	41,170	98,238	168,819	99,788	62,838	51,131	17,886	58,215	**706,909**
(3-4 yrs)	119,287	43,414	100,194	181,963	104,137	66,804	54,203	17,933	58,527	**746,462**
(4-5 yrs)	119,881	41,994	96,833	180,604	100,542	65,476	54,576	17,387	56,106	**733,399**
(5-6 yrs)	123,790	41,794	96,986	187,620	99,603	66,617	53,979	17,332	54,931	**742,652**
(6-7 yrs)	119,996	41,303	93,689	177,739	94,276	65,991	53,580	16,848	51,396	**714,818**
Total 0-7	**766,045**	**279,422**	**645,078**	**1,166,962**	**666,985**	**423,203**	**342,010**	**115,716**	**366,394**	**4,771,815**
(7-8 yrs)	112,890	38,618	89,497	166,128	84,294	61,731	50,470	16,253	48,355	**668,236**
(8-9 yrs)	103,266	34,828	81,714	155,893	77,518	56,869	46,246	15,509	44,852	**616,695**
Total 7-9	**216,156**	**73,446**	**171,211**	**322,021**	**161,812**	**118,600**	**96,716**	**31,762**	**93,207**	**1,284,931**
(9-10 yrs)	98,578	33,822	77,787	159,740	75,727	54,849	44,767	14,760	43,140	**603,170**
(10-11 yrs)	95,621	32,806	73,977	152,548	76,129	56,081	43,898	14,200	43,364	**588,624**
Total 9-11	**194,199**	**66,628**	**151,764**	**312,288**	**151,856**	**110,930**	**88,665**	**28,960**	**86,504**	**1,191,794**
(11-12 yrs)	99,546	31,806	70,234	155,238	76,031	55,910	42,453	14,646	42,083	**587,947**
(12-13 yrs)	103,749	29,324	65,761	149,619	74,922	53,359	40,013	13,825	39,741	**570,313**
(13-14 yrs)	103,480	28,646	62,864	143,549	75,175	53,799	38,285	13,274	37,942	**557,014**
Total 11-14	**306,775**	**89,776**	**198,859**	**448,406**	**226,128**	**163,068**	**120,751**	**41,745**	**119,766**	**1,715,274**
(14-15 yrs)	103,388	29,398	63,840	139,666	76,481	53,763	38,870	13,320	38,606	**557,332**
(15-16 yrs)	103,458	29,461	60,137	135,218	77,318	52,387	38,049	12,792	35,752	**544,572**
(16-17 yrs)	94,057	26,366	51,721	116,285	74,904	48,049	33,679	11,399	29,503	**485,963**
(17-18 yrs)	44,272	13,718	21,709	61,419	44,040	24,919	13,508	5,311	12,185	**241,081**
Total 14-18	**345,175**	**98,943**	**197,407**	**452,588**	**272,743**	**179,118**	**124,106**	**42,822**	**116,046**	**1,828,948**

Key: EC – Eastern Cape; FS – Free State; GAU – Gauteng; KZN – KwaZulu Natal; Lim – Limpopo; MPU – Mpumalanga; NW –NorthWest; NC – Northern Cape; WC – Western Cape
Source: South African Social Security Agency Third Quarter Indicator Report December 2011

2.3 Spending on CSG

In 2011 spending on social assistance in South Africa was R97.56 billion with the largest amount of that going towards the cost of the CSG as seen in Table 4. This expenditure represents approximately 3,5% of Gross Domestic Product (Laryea-Adjei et al 2011).

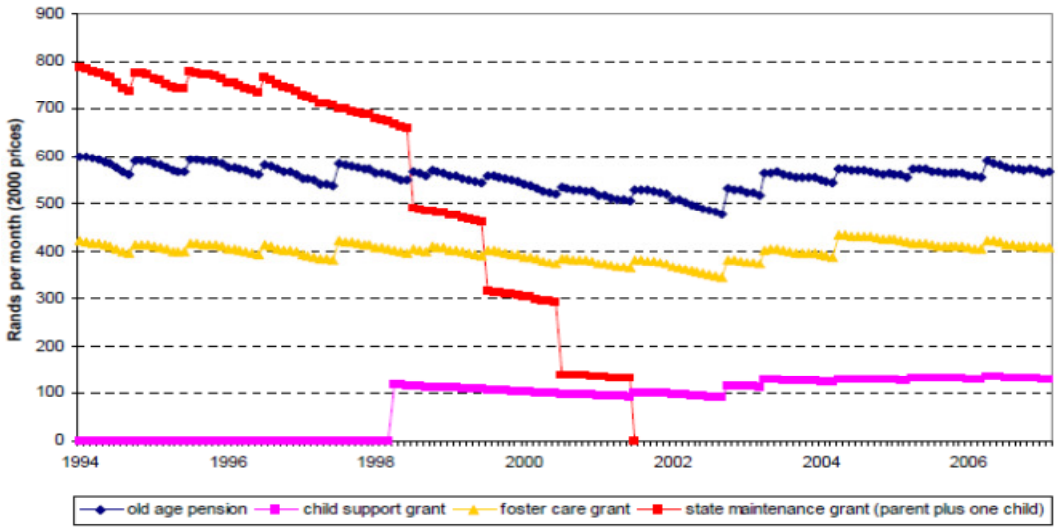
Table 4: Social grants expenditure by type and province, 2007/08– 2013/14

	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	% Growth
R million		*Actual*		*Revised estimate*		*Projected*		per year
Old-age	22,801	25,934	29,826	33,797	36,571	39,913	42,975	11.10%
War veterans	22	20	17	14	12	11	10	-12.30%
Disability	15,280	16,474	16,567	17,080	17,813	19,439	20,626	5.10%
Foster care	3,414	3,934	4,434	4,898	5,536	5,833	6,281	10.70%
Care dependency	1,132	1,292	1,434	1,582	1,727	1,885	2,129	11.10%
Child support	19,625	22,348	26,670	30,594	35,564	38,810	41,993	13.50%
Grant-in-aid	87	90	146	160	177	190	205	15.40%
Social relief of distress	106	623	165	143	160	175	190	10.20%
Total	**62,467**	**70,715**	**79,260**	**88,268**	**97,560**	**106,256**	**114,409**	**10.60%**
Province								
Eastern Cape	11,636	12,557	13,914	15,455	17,071	18,586	20,079	
Free State	4,122	4,573	5,055	5,576	6,117	6,671	7,363	
Gauteng	7,318	8,289	9,390	10,629	11,833	12,871	13,725	
Kw aZulu-Natal	15,105	17,590	19,454	21,536	23,685	25,791	27,394	
Limpopo	8,439	9,656	10,855	12,070	13,419	14,629	15,081	
Mpumalanga	4,322	4,943	5,567	6,080	6,751	7,367	7,601	
Northern Cape	1,622	5,711	2,227	2,500	2,766	3,018	3,429	
North West	5,187	1,962	6,366	6,899	7,515	8,161	8,921	
Western Cape	4,716	5,434	6,432	7,523	8,403	9,162	10,816	
Total	**62,467**	**70,715**	**79,260**	**88,268**	**97,560**	**106,256**	**114,409**	

Source: National Budget Review (2011)

According to Seeking (2007), government spending on social assistance programmes has grown rapidly, from about 2% to about 3.5% of GDP between 1994 and 2006. He argues that this is unique in that no other developing country redistributes as large a share of its GDP through social assistance programmes as South Africa is doing. Figure 3, reflects this growth.

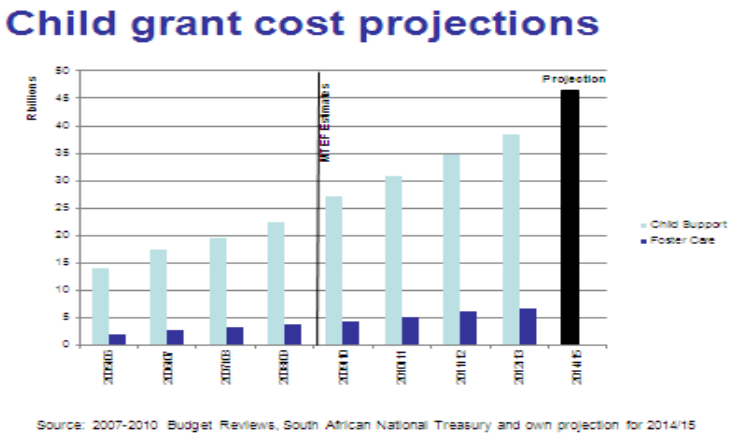
Figure 3: Real value of social assistance grants in South Africa Jan 1994- Feb 2007



Source: Seeking (2007)

More importantly, according to projections of McEwan et al (2010), these costs are going to grow even further as the size and cost of the child support grant is likely to continue to be driven in the main by the progressive increases in the age limit and the means test threshold adjustments as seen in Figure 4.

Figure 4: Child Grant Cost Projections



Source: 2007-2010 Budget Review, South African National Treasury and project for 2014/15

2.4 Impact of the CSG

As a poverty relief measure the CSG is supposed to assist families in meeting the day to day needs of poor and vulnerable children. These needs can range from supplementing the child's nutrition, supporting the child's educational needs, and enhancing the child's overall wellbeing. Seyisi and Proudlock (2009) assessed the impact on children and families of stopping the CSG at the age of 15 using testimonies collected from caregivers of children aged 14 to 18 years. This was done through public hearings in four provinces and a helpline was used to collect telephonic testimonies. The research had two aims, to document how caregivers used the CSG money and what impact the lapsing of the grant has had on their children. A total of 187 testimonies from the Eastern Cape, Gauteng, Limpopo, North West, Mpumalanga, Western Cape and KwaZulu-Natal were heard.

Although their research was focused on what happens after the grant stops it was able to give a good overview of how families were using the grant in a way that allows us to determine its impact. It emerged from the testimonies that families had been able to meet the nutritional needs of their children and the CSG was also playing an important role toward educational needs. Families where using the grant to buy school uniforms, lunch, stationary, transport to and from school and books. What is also interesting to note is that although most of the caregivers qualified for school fees exemption a significant number of them reported that they were not able to get the exemption and were therefore using the CSG for school fees. In meeting the transport needs of some of the children, especially in winter and the rainy season, the CSG ensured that children did not miss too many days from

school. It was also clear that in cases were the primary caregivers were the grandparents of the child, the CSG offered relief to their Old Age Pension (OAP) which allowed them to continue meeting their own needs, such as medical care.

Although the CSG is often viewed as insufficient in itself in terms of amount, when viewed as a percentage of the qualifying households income, it actually forms a significant portion. A study by CASE (2000) found that the average monthly household income in their sample was R837, with an average monthly per capita income of R131. Without the CSG, the average reported income dropped to R714 for the household and to R109 per individual. This means that the CSG was contributing a significant 17% to total income. On average, households derived a third of their income from the CSG and a significant proportion of households were wholly dependent on the CSG (18%), or on the CSG and other state transfers (36%).

Besides offering income support to families, the CSG is also expected to play an important role in mitigating the impacts of economic shocks on households. Jacobs (2010) looked at how the most recent food price crisis and global economic downturn might have affected the food security status of low-income households. The results of this analysis not only showed that female-headed households in traditional huts and informal backyard shacks were severely affected by the twin crisis but also highlighted the fact that households with CSGs fared better than households without.

Still on the role of the CSG on mitigating the impact of external economic shocks on marginalised communities, Ngandu et al (2010) looked at the impact of the global financial crisis on two poor communities; a remote migration sending area and an outlying shack settlement in the Johannesburg/ Pretoria city region. The survey was aimed at identifying some salient aspects about how poor communities respond and perceive large economic shocks. Overall, the study found that respondents could not draw a close connection between the international crisis and household situation. The study found that the household economy for the urban and rural samples was wage-based, with important backup support from social grants and much less important inter-household transfers in the form of remittances. Furthermore, households saw jobs as the key to support, while food and livestock production hardly featured. Nearly all the shack households reported receiving wage income, against four-fifths of the rural households. Women-headed households with no one employed sometimes survived on a combination of grants and remittances. The lack of wage income relegated them to serious poverty.

The latter two studies begin to show that external financial shocks exert a significant negative influence on households, a conclusion that is further supported by Chitiga et al (2010) who looked at the magnitude of the shocks associated with the global economic crisis in macroeconomic terms on South Africa. The study assessed the country's capacity to withstand or cushion economic shocks and more importantly the extent of fragility in terms of poverty levels and child wellbeing. The results of the study showed that the poverty headcount ratio increases marginally in the moderate scenario and substantially under the severe scenario of global recession. This result raises concern in as far as the report also highlights the finding that in the case of South Africa, despite the massive injection of transfers to households with poor children through child support grants, poverty amongst

children remains substantial. Hence the crisis could have only further compounded an already less than desirable situation.

With respect to the link of social grants and labour market outcomes, Chitiga *et al* (2010) found that although there was a larger income loss in urban areas, these households were better protected against job losses because they are often members of households that have a variety of other income sources. However, apart from social grants, which have the effect of diversifying income among the poor, the poor and rural dwellers are, in many cases, quite weakly protected against job loss. This would make social grants an important safety net for this group.

3 Literature Review: spill-over effects of social protection schemes

Sadoulet *et al* (2001) point out that social assistance programs can have both direct and indirect effects. The direct effects are those that are intended by these programs, while the indirect effects are those not directly intended by the programs and can either complement and enhance, or counteract the projected results. To illustrate this, Sadoulet *et al* (2001) make an example of credit programs as well as cash transfer programs. The former is shown to have the direct effects of loosening up liquidity constraints and expectedly boosting the incomes of borrowers, and can also have the indirect outcome of increased school attendance by children as a result of the children being relieved from work that competes with school. The latter is shown to have the direct effect of improving the incomes of recipients.

The remainder of this section is based on a paper commissioned by the Financial and Fiscal Commission, Siebrits and Servaas van der Berg (2010) that explores literature covering the spill-over effects of social protection schemes.

3.1 Conditional Cash Transfers

Conditional cash transfer (CCT) programmes provide money to poor families subject to these families making investments in human capital such as sending children to school or bringing them to health centres on a regular basis (Rawlings (2005). Examples include the *Progresa* scheme of Mexico, and several other countries in Latin America, Central America and the Caribbean also adopted CCT schemes, including Brazil, Colombia, Honduras, Jamaica and Nicaragua. Brazil, for example, adopted the *Bolsa Escola* programme in 2001.

According to Das *et al.* (2005: 57), CCT programmes "… are technically feasible in that the main stated goals of the programs are actually met in practice and are politically acceptable in that successive governments are willing to continue and even expand program coverage". Rawlings (2005: 149-151) summarised evidence on the effectiveness of CCT schemes as follows:

- Primary and secondary school enrolment rates have increased markedly in Mexico, Colombia and Nicaragua since the introduction of CCT schemes.

- The impact of CCT programmes on school attendance has been mixed, ranging from very impressive in Nicaragua to modest in Mexico.
- It appears as if the introduction of CCT programmes has significantly reduced the incidence of child labour in Mexico and Brazil.
- In several countries (including Mexico, Colombia and Nicaragua), child health and nutrition have also improved since the adoption of CCT programmes.
- Participation in CCT programmes apparently has contributed to higher consumption levels in Mexico, Colombia and Nicaragua.
- Evaluations have suggested that CCT programmes are efficient (81 percent of the programme benefits have accrued to the poorest 40 percent of families) and cost-effective in terms of the ratio between benefits and administrative costs.

In some ways, conditional cash transfer programmes are attractive interventions in the current South African context: in return for what should be a modest increase in administrative costs associated with monitoring compliance, such schemes promise significantly higher returns on current social grants spending (mainly accelerated human capital accumulation among children in poor households). Moreover, the adoption of CCT programmes would not require modification of a design principle that is deeply entrenched in South Africa, namely that social assistance should be limited to economically inactive vulnerable groups.

Das *et al.* (2005) suggested a useful conceptual framework for assessing the need for and likely effectiveness of conditional cash transfers in a variety of settings. Their point of departure was a standard theoretical argument for the superiority of unconditional cash transfers over conditional cash transfers: all other things equal, successful attempts to change the behaviour of rational (non-myopic) poor agents by means of conditional transfers reduce their welfare, because such efforts distort the decisions of the agents by inducing them to make choices which they would not have made otherwise (Das *et al.*, 2005: 63). They then posed the following question: 'could there be market failures which prevent poor agents from making optimal choices, in which case appropriately designed conditional cash transfer programmes could enhance efficiency and the welfare of individual agents and society as a whole'? Das *et al.* (2005: 64-71) identified the following possible market failures which could make conditional cash transfer interventions welfare-enhancing:

- *Efficiency-related market failures*. Mismatches between the interests of children and the preferences of parents could result in underinvestment in the education of the former. Children cannot credibly commit themselves to repaying parents for investments in their schooling. Hence, some parents may prefer inferior short-run outcomes which benefit them relatively more (*e.g*. higher incomes resulting from child labour or from using school-age children to look after younger siblings) to superior long-run outcomes involving relatively larger gains for the children. In such cases, cash grants tied to school enrolment and attendance could yield higher levels of efficiency and welfare by reducing or eliminating the gap between parental preferences and children's interests.

- *Equity-related market failures*. When it is not feasible to use conventional means testing for targeting purposes, attaching conditions to a cash transfer scheme programme can be a useful self-targeting alternative. The idea would be to use conditions which would tilt the cost-benefit calculation of higher-income groups against participation in the scheme (*e.g*. prescribing periodic visits to public health facilities which require a degree of queuing that would impose high opportunity costs on richer people with access to other health facilities).

3.2 Workfare Programmes

Standing (1990: 680) defined workfare as a "government-administered policy whereby those in need and without regular employment are obliged to undertake work-related activity in return for state income transfers". A further distinction is sometimes made between two categories of workfare schemes which impose different types of obligations on the recipients of social grants: mandatory workfare requires actual work, while "new-style" workfare requires participation in other employment-related programmes (such as job-seeking, community work, training and formal schooling) (Standing, 1990: 680).[2]

Contemporary workfare programmes originated in OECD countries, where trends such as rising long-term unemployment and changing family structures prompted concern about the work incentive effects of traditional social assistance systems and their ability to address growing social exclusion (Tesliuc, 2006: 5-8). Core elements of such programmes have included steps to reduce the amounts and duration of benefits and to force beneficiaries to seek work actively, often complemented by other measures to encourage working and social inclusion, including termination of the cancelling of benefits when recipients obtain part-time work, changing the delivery of benefits from the household to individuals so that individuals do not jeopardise the household's access to benefits when they find jobs, making the provision of benefits conditional on finding employment (e.g. cash bonuses, wage supplements and tax credits), and offering more assistance to job seekers (labour-market information, training programmes, *etc*) (Tesliuc, 2006: 7).[3] Hudson and Kühner (2009) described this development as a shift from "protective" to "productive" modes of providing social assistance.[4]

The United States pioneered modern welfare reforms aimed at integrating recipients of social benefits into the formal labour market. The workfare approach can be traced back to experimental programmes introduced by the Reagan Administration in 1981, but reached maturity under the Clinton Administration with the implementation of the Personal Responsibility and Work Opportunity Act (PRWORA) of 1996 and other welfare reforms. The major elements of US workfare programmes have been as follows (*cf*. Blank, 2004: 4-8).

[2] Hence, workfare programmes are a subset of conditional cash transfer programmes, but with a specific focus on members of the labour force.

[3] Ochel (2005: 78) emphasized that workfare programmes focus primarily on work; training and other mechanisms to achieve reintegration into the labour market are of secondary importance.

[4] This shift also could be described in terms of the typology proposed by Devereux (2002: 661, 662) as one from a "livelihood protection" to a "livelihood promotion" approach (cf. section 3.2.2).

First, PRWORA abolished the matching-grant Aid to Families with Dependent Children (AFDC) programme and replaced it with Temporary Assistance to Needy Families (TANF), provided to states as a block grant. The introduction of TANF allowed the states much more discretion over programme design than AFDC, and the block-grant basis raised the importance of careful design by transferring the full financial risk of cycles in assistance needs to states. The PRWORA legislation also made access to federal funds conditional on states placing larger numbers of their active welfare recipients in jobs, limited TANF-funded assistance to 60 months over the full lifetimes of individuals, and limited access to income assistance programmes by certain targeted groups (*e.g*. immigrants and certain categories of disabled persons). The states responded to the PRWORA legislation by:

- markedly expanding their welfare-to-work programmes
- reducing the rate at which cash benefits decrease as earnings increase (to encourage working)
- enforcing sanctions (benefit losses) on assistance recipients who did not participate in work programmes
- enforcing the Federal 60-month limit on eligibility for TANF-funded assistance and, in some cases, setting and implementing even tighter limits

Other policy changes strengthened state-level efforts to get welfare recipients in jobs. These included the expansion of in-kind assistance to needy families by means of child-care subsidies, food stamps and Medicaid services, as well minimum wage increases and expanded refundable tax credits under the Earned Income Tax Credit (EITC) system (Blank, 2004: 9-12).

In a careful review of the empirical evidence, Blank (2004: 14-18) highlighted three major results of these changes:

- The number of persons on the welfare rolls dropped by 42 percent from 1994 to 2001, and did not rebound significantly during the 2000-2001 recession.
- Employment increased sharply during the late-1990s, especially among less-skilled single mothers. Data from 2002 showed that the majority of the women who had left welfare in the 1990s remained employed, although a significant minority were jobless.
- The incomes of single mothers (the group affected most heavily by the changes) rose during the second half of the 1990s, despite the fact that many of them lost cash benefits as a result of the introduction of workfare.

These developments suggest that workfare programmes have succeeded in their primary aims of reducing welfare caseloads and moving welfare recipients into jobs. Blank (2004: 37-40), however, added that it is particularly difficult to separate the effects of such programmes from concurrent labour-market developments such as the rapid growth in job opportunities and earnings in the US during the second half of the 1990s; furthermore, it is too soon to ascertain some of the longer-term effects of the welfare reforms on the livelihoods and social choices of needy families.

Welfare reforms with workfare elements were also implemented in the United Kingdom by the Labour Government of Tony Blair, as well as in the Scandinavian countries. The UK reforms, known as the New Deal, offer assistance to four groups of welfare recipients: young unemployed persons aged 18 to 24, long-term unemployed aged 25 and above, lone parents and disabled people (*cf*. Kildal, 2001: 4; Ochel, 2006: 80-81). Younger unemployed persons first entered a period of intensive job-search (the "Gateway"), after which they had to choose among four six-month options, namely subsidised employment, full-time education and training, voluntary service, and the Environmental Task Force (Ochel, 2006: 80). This was followed by another period of intensive job search (known as the "follow-through"). Unemployed persons aged 25 and above who had received the Jobseeker's Allowance continuously for 12 to 18 months underwent a 13-week Gateway period, followed by an Intensive Activity Period that lasted another 13 weeks and provided subsidised employment or education and training opportunities (Ochel, 2006: 81). Several studies reviewed by Ochel (2006: 80-81) found that the New Deal programmes successfully promoted the employment of younger and long-term unemployed people in the United Kingdom.

The Scandinavian countries have long combined a commitment to the maintenance of full employment (pursued by means of active labour-market policies, *inter alia*) with the belief that generous social benefits for the unemployed are basic social rights regardless of achievements and financial means (*cf*. Kildal, 2001: 5-6). During the second half of the 1990s, however, the governments of these countries also introduced workfare-like welfare reforms, with Denmark leading the way. Prior to a series of labour-market reforms introduced from 1993 until 1998, the jobless in Denmark could have accessed unemployment benefits indefinitely, provided that they had participated in work programmes for six months during each three-year benefit cycle (Kildal, 2001: 7-9). The first wave of reforms abolished the right to earn new benefits through participating in work programmes by limiting the period of entitlement to seven years, of which the last three years involved compulsory "activation initiatives" aimed at reintegration into the labour market. The limits subsequently were tightened and by 1998 the maximum unemployment period was four years, including three years of activation activities. In 1996, these steps were complemented by special measures for low-skilled individuals under 25 years of age, who after six months of unemployment were compelled to enter education or work-training programmes and accept sharply reduced benefits. Ochel (2006: 81) reported positive employment effects for these Danish workfare programmes, but Kildal (2001) was more circumspect and expressed concern about the implications of such programmes for norms of fairness and justice that have long underpinned the Scandinavian welfare regimes.

The available evidence therefore indicates that workfare programmes can be effective mechanisms for returning welfare recipients to work, especially in rapidly growing economies where sufficient numbers of jobs are created to absorb programme participants in the regular labour market. The importance of the availability of jobs is magnified by the reality that workfare programmes affect the low-skilled labour market by assisting unemployed people in getting regular public or private sector employment. In contrast to public works programmes, which provide government-created temporary jobs, workfare therefore causes competition between social security recipients and regular workers for low skilled work in the formal labour market (*e.g*. sweeping streets, cleaning parks, and basic

clerical tasks). Hence, inadequate availability of jobs may well be the most serious barrier to the successful implementation of workfare programmes. Moreover, the US experience showed that workfare programmes can be time-consuming and financially expensive: the costs to be taken into consideration are the work-related and child care expenses of recipients as well as supervisory and administrative costs (Samson *et al.*, 2001: 12). Kildal (2001: 14) also warned that workfare-type schemes could easily lead to two-tiered labour markets in which poor labourers are compelled to work on "second-rate terms", lacking labour rights and sickness, vacation and unemployment benefits. As mentioned earlier, this paper seeks to contribute the literature on the economy wide effects, both direct and indirect, of the CSG policy.

4 MODELLING FRAMEWORK

The methodology developed for this project and described below will help us to estimate the potential effects on South African households' welfare and on the economy following a change in the CSG scheme.

In particular, we will present three simulation scenarios:

1) Simulation 1 (sim1): An increase in the value of the CSG (20% of the CSG for people already benefiting from the transfer) and
2) Simulation 2 (sim2): An increase, by two million, of the number of beneficiaries among the eligible children – (for more details on the selection of the new beneficiaries see details in Appendix 1).
3) Simulation 3 (sim3): simulation 1 and simulation 2 together. Of course, the additional beneficiaries (as for sim2) would also benefit from a 20 percent increase of the CSG (as for sim1).

There are two main justifications for these proposed simulations in South Africa. The first is that there is relatively little public awareness about social protection instruments' economy wide impacts of CSG. The second is that already in policy circles we know there is need to accelerate reaching some 2 million eligible children who are not receiving the CSG for mainly administrative reasons.

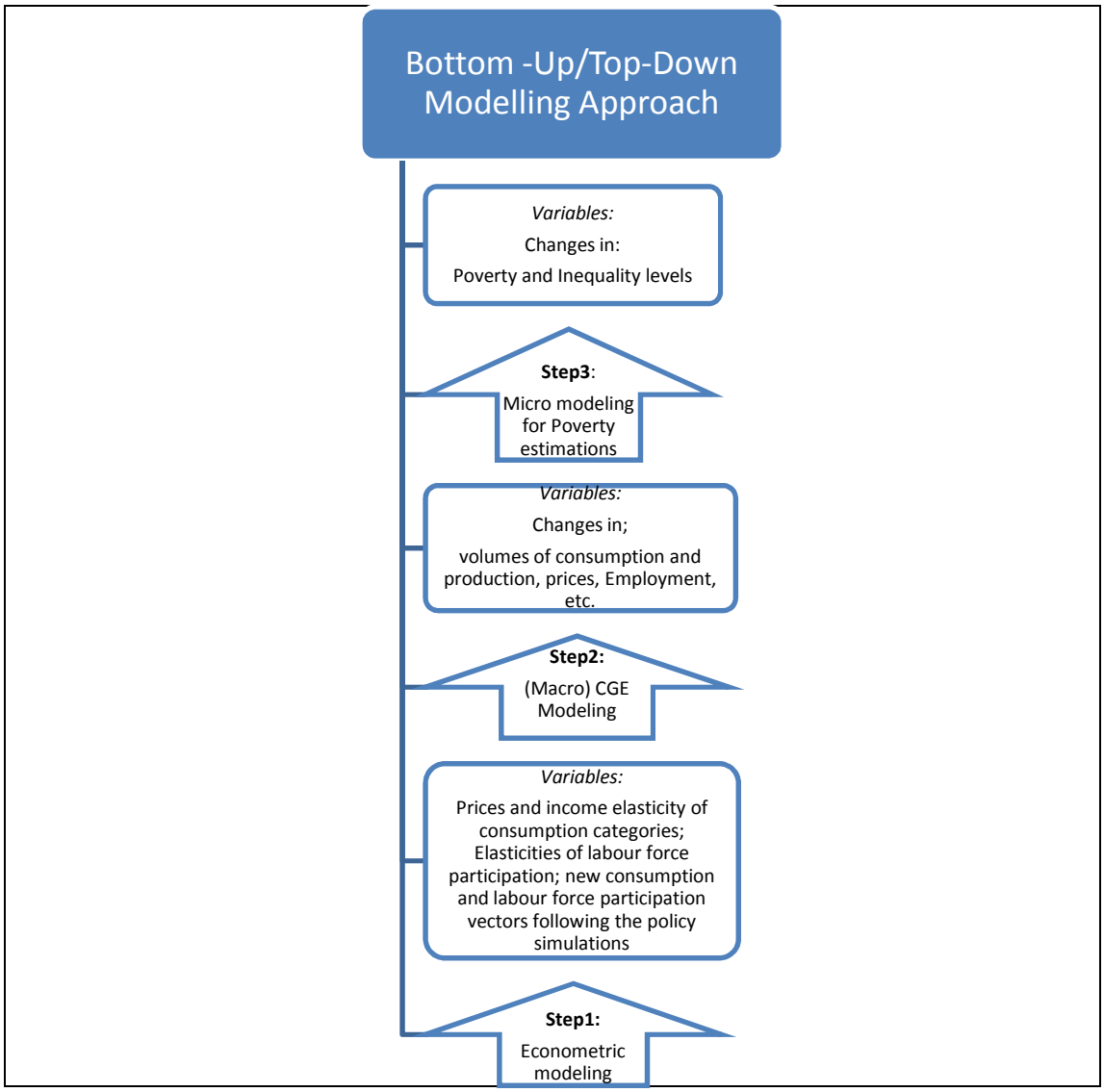
Figure 5 below summarizes the modelling framework. Conceptually, the modelling process starts with **Step 1** which consists of micro-simulation modelling. Here the following variables will be estimated and fed into the Computable General Equilibrium (CGE) model:

i. Estimation of consumer prices and income elasticities and simulation of the effect of a change in CSG on consumption patterns
ii. Estimation of a model for labour force participation and simulation of the effect of a change in the CSG on labour force participation

Once the relevant changes are estimated, they are then transmitted to the macro (CGE) model. This constitutes **Step 2** of the modelling process. This model simulates changes in different variables (e.g. volumes of consumption and production, prices, employment) which

will then be inserted into the micro module in order to produce changes in poverty and inequality following the reform in the CSG scheme (**Step 3**).

Figure 5: Modelling Framework



4.1 The micro model and the linking variables to the CGE module (bottom-up):

The micro-economic module identifies two main channels through which the change in the CSG affects the economy: *labour force participation* and *household consumption*. The models described hereafter are estimated based on the National Income Dynamic Study (NIDS) from 2008.

With regards to the *labour force participation*, the change (positive or negative) in the incentive to participate in the labour market due to a variation in the social transfer is estimated. Past research shows controversial results of the effects of the receipt of the Old Age Pension on labour supply (see Betrand et al., 2003; Posel et al., 2006; Ardington et al., 2009), but relatively few papers focus on the impact of the CSG on labour supply or

participation. Eyal and Woolard (2011) found a positive effect for Black mothers aged 20 to 45 of the CSG on the labour force participation, employment probability and unemployment (conditional on being a participant).

Knowing whether labour force participation or employment are affected by CSG receipt is not obvious due to the endogeneity of the CSG variable. In South Africa, as in most of other contexts, the grant is not randomly assigned but its receipt is likely to be correlated to e.g. income, education, place of residence and bureaucratic restrictions. It follows that, if some modelling precautions are not taken into account, the CSG coefficient risks being biased. In order to check for and to take into account the endogeneity problems, we will follow, with major modifications Bertrand et al. (2003) and Eyal and Woolard (2011).

We use an instrumental variable probit model (with the standard errors corrected for geographic clusters' correlation), where the binary (dependant) variable is the labour force participation and the per household amount linked to the grant is instrumented by the number of age eligible children residing in the household. The estimations follow the procedure described in Wooldridge (2002, pg. 472-477) and are computed by the use of *ivprobit* Stata command.

All kinds of workers (for wage, self-employed and casual) and short-term unemployed are taken as participating into the labour force (following the definition reported in the Labour Force Survey reports in South Africa). The estimates are run on a sample of individuals not enrolled in school at the time of the survey and aged between 15 and 64 years old. Although we are aware that the CSG is more likely to affect mothers in the younger tail of the population, we used the entire working age population, as defined by StatsSA and consistent with the definition of workers in the Social Accounting Matrix (SAM) used in the CGE. This model is then used to predict the change in the proportion (or probability) in labour force participation following the extension of the CSG.

In order to check for coefficients' robustness, the model was rerun only on individuals aged 22 to 50 years old (not enrolled in school at the time of the survey). Finally, the sample was restricted only to people whose youngest child they live with, is aged between 12 and 15 (that is, just around the age eligibility threshold), again, leaving those enrolled in school out of the analysis. By restricting the age group of beneficiary children, the heterogeneity of children's needs is reduced, and labour supply behaviour (especially for women) is less likely to be affected by the presence of young children.

As for the *consumption*, with the estimation of a demand system, the effect on household's consumption behaviour (and on the aggregate demand for different goods) due to a change in the grant, is evaluated. The demand system used here is the Exact Affine Stone Index (EASI) system of Pendakur and Lewbel (Lewbel and Pendakur, 2009; Pendakur, 2008). EASI system has the advantages of the Almost Ideal Demand System (AIDS) but not its limitations: as AID system, EASI budget shares are linear in parameters given real expenditures. However, unlike the AIDS, EASI demands can have any rank and its Engel curves can have any shape over real expenditures. EASI error terms equal random utility parameters to account for unobserved preference heterogeneity. EASI demand system will be estimated by

an iterated three stage least squares model. The estimate provides prices, income and other variables (including the CSG) elasticity of different consumption categories.

Consider the following cost function in the EASI class:

$$\ln C\left(p,u,z,\varepsilon\right)=u+\sum m^{j}\left(u,z\right)\ln p^{j}+\frac{1}{2}\sum\sum a_{jk}\ln p^{j}\ln p^{k}+\sum\varepsilon^{j}\ln p^{j} \quad (1)$$

where *u* is the implicit utility[5], *p* is the J-vector of prices p=[p_1 , p_J], and *z* demographic characteristics[6]. By Shepard's Lemma, the Hicksian budget-share functions are :

$$w^{j}\left(p,u,z,\varepsilon\right)=m^{j}\left(u,z\right)+\sum a_{jk}\ln p^{k}+\varepsilon^{j} \quad (2)$$

where $a_{jk} = a_{kj}$ for all *j, k*. Implicit utility is given by :

$$y=u=\ln x-\sum w_{j}\ln p^{j}+\frac{1}{2}\sum\sum a_{jk}\ln p^{j}\ln p^{k} \quad (3)$$

where $\ln x-\sum w_{j}\ln p^{j}$ is the log of stone-index deflated nominal per capita expenditures. By substituting $m^j(u,z)$ by $m^j(y,z)$ where :

$$m^{j}\left(y,z\right)=\sum b_{r}^{j}y^{r}+\sum g_{t}^{j}z_{t} \quad (4)$$

we finally get the implicit Marshallian Demand system :

$$w_{j}=\sum b_{r}^{j}y^{r}+\sum g_{t}^{j}z^{t}+\sum a_{jk}\ln p^{k}+\varepsilon^{j} \quad (5)$$

The selected consumption categories are meat, fish, fruit and vegetables, dairy products, rice and grains, starches, bakery, beverages and tobacco, other food, education and other non-food goods and services. Since the NIDS does not contain any direct and indirect information to construct the unit prices associated to each consumption category, we will use primary price data collected by Statistics South Africa at the provincial and regional levels. Apart from prices, other explanatory variables are gender and age of the household head, population group, household size, education level of the household head, total amount of CSG per household, total per capita household expenditure, and geo-type (rural formal, urban formal, urban informal and tribal authority). The CSG variable was instrumented as discussed above.

After the estimation of consumption coefficients, we simulate the changes in consumption patterns (i.e. changes in the average consumption shares for all the categories) following the reform in the CSG scheme as proposed in the three simulation scenarios. These changes, together with those simulated for the labour force participation, are then plugged into the macro model (*bottom-up*). The new additional 2 million children benefiting from the CSG are estimated as described in Appendix 1.

[5] This utility is implicitly defined in terms of observables, namely expenditures x, prices p1, ..., pJ and budget-shares in w1, ...wj.

[6] The first element of z is 1.

4.2 The Computable General Equilibrium model and the linking variables to the micro module (top-down):

The Social Accounting Matrix (SAM) used is based on the 2005 Supply and Use (SU) Tables obtained from Stats SA and other national data sets from various sources such as the Reserve Bank. The original SAM[7] had 85 activities and commodities. For the purpose of this study, we aggregated this SAM into 12 activities and 12 commodities. We wanted to have the best possible match between the micro and macro models. Thus, the sectors/commodities are the following: Meat, Fish, Fruit and vegetables, Dairy, Grain milling, Starches, Bakery, Other foods, Beverages and tobacco, Non alimentary products, Education, other products[8].

The SAM has two broad factors, labour and capital; four institutional sector accounts (households, enterprises, government and the rest of world); and two saving and investment accounts (change in inventories and gross fixed capital formation (GFCF)).

For the trade parameters, we use Gibson (2003) for the low-bound export supply. Estimates for parameters in industries' production are not available for South Africa. Therefore, this study borrows these values from the literature surveyed by Annabi et al. (2006).

In terms of modelling, we use the static Poverty and Economic Policy (PEP 1-1) standard model by Decaluwé et al (2009), changing several assumptions to better reflect the South African economy and to better fit with the micro-model. First, we introduced unemployment. Indeed, South Africa faces high unemployment, but unions are very strong. As a result, wages and salaries are strongly rigid downwards. To take this rigidity into account, we assume that wages cannot decline. Thus, if production decreases, producers will not be able to decrease their wages below initial levels, and will therefore have to retrench some workers.

Then, to introduce the changes in households' consumption shares, we assume that households' utility is a Cobb Douglas function, rather than a LES function as in PEP1-1.

In terms of closure rules, the numeraire is the nominal exchange rate. As South Africa is a small country, world prices are assumed fixed. However we assume that South African exporters face a less than infinite foreign demand equation for exports. In order to increase their market share on the world market they need to reduce their FOB prices for exports. Labour is mobile across sectors whereas capital is sector specific. Public transfers and government spending are fixed. The rest of the world's savings is fixed meaning that we do not allow South Africa to borrow from the rest of the world.

The CGE will generate new prices and volumes after a change in the social transfer (as described above) and these changes will be transmitted to the micro module (*top-down*) in order to estimate changes in monetary poverty and inequality. In particular, the changes in consumer and producer prices, as well as of intermediate consumption prices and revenues

[7] Davies R. and J. Thurlow (2011) A 2005 Social Accounting Matrix for South Africa. Washington DC, USA: International Food Policy research Institute.

[8] Note that this last category contains all the durable goods that are not taken into account in the micro model.

from capital are integrated into the micro module and used to estimate the new real household expenditure per capita incorporating the multiplier effect in the economy that was generated by a change in the social grant. More specifically, we estimated the changes of employment status and its associated revenue, revenues from agriculture and non-agriculture sectors in comparison with the base year, and then obtained the total per capita change of household revenues associated to the two simulation scenarios. As we make the hypothesis that there are no savings, changes in revenues were fully transmitted into the consumption vector and used to estimate the equivalent income.

The change in the employment status is carried out by using a multinomial logit model. For people aged between 15 and 64 years old who were not enrolled in school at the time of the survey, we first identified four possible statuses: wage worker, unemployed, self-employed and not participating in the labour market (i.e. not working or discouraged). After the model was estimated, we predicted the individual probability associated with each of the four categories. The relevant estimated changes produced by the CGE model – namely wage workers and unemployed – are then plugged into the micro analysis. More specifically, an "x per cent" increase (decrease) in the rate of wage workers is transmitted to the micro data by changing accordingly the employment status among unemployed or people not participating in the labour market (wage workers) that showed the highest (lowest) probability of being wage workers. Similarly, when an "x per cent" increase in the unemployment rate is simulated, the corresponding absolute increase of people who were not participating in the labour market and who showed the highest probability of being unemployed were moved to the pool of unemployed. If a decrease in the unemployment rate was simulated, the people who were initially unemployed and that showed the lowest probability of being unemployed were moved out of unemployment. Here it is assumed that the self-employed are not affected by changes in the employment status.

Changes in the employment status are reflected in changes in wage income. People losing their wage jobs, experience a reduction in wage incomes equal to their observed wage; while those finding a wage job, have an increase in wage income equal to their predicted wage (calculated by estimating a Heckman selection model on some individual and household characteristics). For simplicity, it is assume that unemployed people do not benefit from South African unemployment subsidies if they become unemployed. In addition, the wage rate does not decrease as its initial value is initialised at the minimum value, which is imposed in the macro model.

The change in the revenue from self-employment activities ($\Delta\pi_h$) in the agriculture (food and non-food) sector, for household *h* is defined as:

$$\Delta\pi_h = \sum_{k=1}^{K} Y_k \Delta p_{Y,k} - I_k \Delta p_{I,k} \qquad (6)$$

where Y_k is the production value of good *k* at the base year, $\Delta p_{Y,k}$ is the change in producer price of good *k* (pre and after simulation), I_k is the value of inputs purchased for the production of good *k* and $\Delta p_{I,k}$ is the change in price of inputs for the production of good *k*

(the simulated changes in the price of intermediary goods are used). Note that self-consumption is included in this income component, but its change is calculated by using changes in consumer prices, rather than in producer prices.

Income from self-employment activities ($\Delta\varphi_h$) in the non-agricultural sector, for household *h* is defined as:

$$\Delta\varphi_h = \sum_{j=1}^{J} Y_j \Delta\left(p_j VA_j\right) \tag{7}$$

where Y_j is the production value of good *j* at the base year and $\Delta\left(p_j VA_j\right)$ is the change in the value of the value-added good *j* (pre and after simulation).

Changes in total household revenue (ΔY_h) relative to the base year for each scenario can thus be written as:

$$\Delta Y_h = \Delta\pi_h + \Delta\varphi_h \tag{8}$$

Finally, the approach we used to evaluate the effect on households' welfare following the simulated reforms of the CSG scheme is the one introduced by King (1983), referred to as equivalent income. According to this approach, for a given budget ($\mathbf{p_c}$, $x_{c,h}$), the equivalent income, $e_{c,h}$, is defined as the value of income ensuring the same utility level that would have been obtained with the budget ($\mathbf{p}^r$, $e_{c,h}$). We derived $e_{c,h}$ starting from the EASI model as follows (for more details, see in Appendix 2):

$$e_{c,h} = \exp\left(\ln x_{c,h} - \sum_{j=1}^{J} w^j \left(\ln p_c^j - \ln p_r^j\right) + \frac{1}{2}\sum_{j=1}^{J}\sum_{k=1}^{K} a_{j,k}\left(\ln p_c^j \ln p_c^k - \ln p_r^j \ln p_r^k\right)\right) \tag{9}$$

Where $\ln x_{c,h}$ is the log of per capita expenditure after simulation (i.e. per capita expenditure at base year plus the change in per capita revenue, as estimated before).To measure the poverty effects of the reform in the CSG scheme, the popular Foster-Greer-Thorbecke (1984) (FGT) family of poverty indices is used. The FGT family of indices is then defined as:

$$P_\alpha(z) = \frac{1}{\mathbf{N}}\sum_{h=1}^{H} \rho_{c,h} n_{c,h}\left(\frac{z - e_{t,h}(\mathbf{p}_{0,C,k}, \mathbf{p}_{t,c,k}, y_{t,c,h})}{z}\right)_+^\alpha \tag{10}$$

Where *z* is the national monthly poverty line at the base year (equal to 502 Rands (see Argent et al., 2009)), $f_+ = \max(0, f)$, **N** is the number of households in the survey, $n_{c,h}$ is the size of the household *h*, $\rho_{c,h}$ is the sampling weight of *h*, α is a parameter that captures the "aversion to poverty" or the distribution sensitivity of the poverty index, and $e_{t,h}$ is the per capita equivalent income (as defined in 9) at time t (t corresponds the different scenarios we have – base year, sim1, sim2 and sim3 respectively). Here we report figures for α = 0, 1 and 2, measuring the incidence of poverty (headcount ratio), poverty gap and the severity of poverty respectively.

To measure the inequality effects of the reform in the CSG, we use the well-known Gini index. Starting from the class of single-parameter Gini (see Duclos and Araar, 2006) indices

$$I(\rho) = \int_0^1 \left(p - L(p) \right) \kappa(p; \rho) dp \qquad (11)$$

for $\rho=2$, we get the standard Gini index, with ρ being an ethical parameter, $L(p)$ being the cumulative percentage of total income held by the cumulative proportion p of the population (ranked according to increasing consumption values) and $\kappa(p, \rho)$ being the percentile-dependent weights to aggregate the distances p-$L(p)$.

5 Results and analysis

5.1 Micro results:

Results of the labour force participation model are shown in Table 5. We present three specifications of the model differing only in the sample on which they are run, as described above. The coefficient associated with the total amount received by the household through the CSG is fairly robust across the three specifications. We always find a positive link between the CSG and the probability of participating in the labour force, although, as expected, the coefficient's value is slightly higher when only people whose youngest children are around the age eligibility threshold are included (model 3). Specification (1) is finally retained for the simulation analysis.

Table 5: Results of the labour force participation model

	(1)	(2)	(3)
CSG_amount_hh	0.000548**	0.000504*	0.00307*
Age	-0.00205	0.00691***	0.0280***
ln_pcincome	0.0857***	0.104***	0.214***
Hhsize	-0.0521***	-0.0568***	-0.0474
Geo-type: rural formal (comparison modality)			
tribal authority areas	-0.452***	-0.522***	0.192
urban formal	-0.267***	-0.284**	0.469
urban informal	-0.148	-0.186	0.184
Province: Western Cape (comparison modality)			
Eastern Cape	0.217*	0.306**	0.21
Northern Cape	0.0977	0.153*	0.555
Free State	0.296***	0.296**	-0.137
KwaZulu-Natal	0.107	0.0987	0.255
North West	0.330***	0.370***	0.431
Gauteng	0.294***	0.294***	0.173
Mpumalanga	0.329***	0.381***	0.586**
Limpopo	-0.00593	0.0138	-0.109
Education: less than 7th (comparison modality)			
less than 12th	0.147***	0.161***	0.211
12th or more	0.357***	0.312***	0.202
Marital status: married/living with partner (comparison modality)			
widow/divorced	0.0332	0.214**	0.502**
never married	-0.226***	-0.0959**	0.253
_cons	-0.326	-0.636***	-3.251***
total amount of CSG per hh (instrumented variable)			
n_child	106.5***	104.7***	64.93***
Rho	-0.0636	-0.0531	-0.222
N	15911	10944	784

Source: authors' estimation based on NIDS 2008
*Note: *p<0.10,**p<0.05,***p<0.01; amount of CSG instrumented by n_child (the number of age eligible children); model (1) is estimated on the entire sample of working age people 15-64 (not currently enrolled in school), model (2) on people aged 22-50 (not currently enrolled in school), model (3) on people aged 22-50 (not currently enrolled in school) and living with children aged 12-15 (without younger children)*

Table 6 reports the quantity elasticities with respect to own price, expenditure and CSG for each category. They all take the expected sign, revealing an interesting heterogeneity across categories. Fruit and Vegetables, rice, starches and beverages are more responsive to a percent change in their price (more than proportionate reduction), while the own price elasticity for other non-food items is -0.84. Education and other non-food items are found to be superior goods as their demand increase by 1.70 and 1.17% respectively after a percent increase in household expenditure, whereas demand for rice and starches only rise by around 0.60%. Finally, only education and other food categories are found to have a statistically significant CSG elasticity, 1.17 and 1.11 respectively.

Table 6: Quantity elasticities with respect to own price, expenditure and CSG (with t-stat) evaluated at the sample mean

	Own Prices		Expenditures		CSG	
Category	**Elasticity**	**t-stat**	**Elasticity**	**t-stat**	**Elasticity**	**t-stat**
Meat	**-0.95**	-21.22	**0.78**	43.98	0.86	-1.42
Fish	-1.11	-1.79	**0.73**	16.40	0.91	-0.19
Fruit & Vegetables	**-1.15**	-2.06	**0.89**	38.53	0.96	0.50
Milk	-0.96	-1.37	**0.98**	27.13	0.92	-0.14
Rice	**-1.20**	-3.76	**0.58**	35.43	0.95	0.45
Starches	**-1.09**	-3.96	**0.60**	24.84	0.97	0.74
Bread	**-0.94**	-4.43	**0.74**	29.88	0.84	-1.62
Beverages	**-1.02**	-9.28	**0.82**	43.51	0.93	-0.09
Education	**-0.96**	-16.07	**1.70**	34.45	**1.17**	2.33
Other Food	**-0.98**	-30.35	**0.82**	38.11	**1.11**	3.27
Other non-Food	**-0.84**	-2.58	**1.17**	42.45	0.88	0.79

Source: authors' estimation based on NIDS 2008
Note: Calculation of elasticities is shown in Appendix 3. Standard errors are calculated with the Delta method. Elasticities values in bold are statistically significant at 5 percent.

Both simulations represent three different shocks that are integrated into the macro model. The shocks only differ by their magnitude between the three simulations. Table 7 summarizes the results of the shocks:

Table 7: Results from the micro model used for the macro model

	(Micro) sim1	(Micro) sim2	(Micro) sim3
(Macro) Shock1: change in labour supply (in %, variation)			
	1.429	1.581	3.342
(Macro) Shock2: change in government transfer received by households (in %, variation)			
(Macro) Shock3: Change in consumption shares (absolute difference)			
Meat	-0.00031	-0.00015	-0.00048
Fish	0.00011	0.00005	0.00018
Fruit & Vegetables	-0.00007	-0.00004	-0.00012
Milk	0.00002	0.00001	0.00005
Rice	-0.00057	-0.00027	-0.00094
Starches	-0.00007	-0.00003	-0.00010
Bread	-0.00011	-0.00005	-0.00015
Beverages	0.00014	0.00009	0.00031
Education	0.00169	0.00064	0.00234
Other Food	0.00011	0.00009	0.00023
Other non-Food	-0.00096	-0.00035	-0.00133

Source: authors' estimation based on NIDS 2008

As mentioned earlier, there are three shocks that are applied to the CGE model at the same time. Each one of them will have a different impact on the economy. Ceteris paribus, an increase in the labour force would have an impact on unemployment, as it is not feasible for

firms to lower wages below the minimum wage. In the same way, an increase of the transfer households receive from government will increase their income and increase government's deficit. Finally, the changes in households' consumption shares will have impacts on final demand.

Volumes of households' consumption follow the new repartition of the budget shares. Indeed, education and fish shares are increasing in households' budget. Ceteris paribus, we expect their volume to increase. On the contrary, meat and rice's shares are decreasing, so we expect their corresponding demand from households to decrease.

Table 8: Impact on consumption volumes (in%)

	sim1	sim2	sim3
Meat	-0.91	-0.41	-1.4
Fish	1.09	0.53	1.8
Fruit&Vegetables	-0.54	-0.24	-0.83
Milk	0.19	0.13	0.4
Rice	-1.57	-0.72	-2.59
Starches	-0.65	-0.25	-0.91
Bread	-0.34	-0.13	-0.44
Other food	0.28	0.22	0.57
Beverages	0.23	0.17	0.48
Education	4.95	1.93	6.93
Other non-Food	-0.04	0.04	0.02

Source: Results from CGE

These changes in households' consumption patterns will have an impact on the production of these sectors. Indeed, for the alimentary products such as meat and fish commodities, final demand represents between 75 and 95% of the composition of total demand for commodities. Thus, this change in households' consumption will have a huge impact on their production. In contrast, the non-alimentary commodity rely more on intermediate demand from other sectors.

Table 9: Impact on production volumes (in %)

	sim1	sim2	sim3
Meat	-0.92	-0.42	-1.43
Fish	0.75	0.36	1.24
Fruit & Vegetables	-0.28	-0.11	-0.40
Milk	0.19	0.14	0.41
Rice	-1.24	-0.58	-2.08
Starches	-0.69	-0.27	-0.97
Bread	-0.82	-0.35	-1.24
Other food	-0.04	0.03	0.00
Beverages	0.13	0.10	0.28
Education	4.48	1.75	6.27
Other non-Food	-0.01	0.00	-0.01

Source: Results from the CGE

Production increases, notably in the education sector, see Table 9. This sector, as well as the dairy sector are intensive in labour. Thus, to increase their production, both sectors will hire more workers. To produce more, firms can hire workers, whether they come from the other sectors whose production is decreasing or from the increase in the labour supply due to the cash transfer. The overall effect on labour is an increase by 0.04% and 0.05% respectively in the first and second scenarios. In the third scenario, where the two policies are combined, labour increases by 0.08%.

This impact on the labour market, together with the increase in the transfer they receive, results in an increase in households' income. As consumption, direct taxes and savings are a proportion of agents' income, they logically increase in both scenarios.

Government's income increases, due to the increase in direct taxes receipts, as well as on indirect taxes (as consumption increases) and production taxes. However, given the increase in its transfers (i.e. the increase of the CSG), government's savings are decreasing[9]. This drop has an impact on total investment which decreases. This drop in investment will have an impact on non-alimentary and other food commodities, as they are the only ones which are consumed for investment purposes. The impact on price is hardly perceptible as seen in Table 10. The consumer price index increases very slightly respectively by 0.022%, 0.014%, and 0.03% in the three scenarios.

[9] We assume that there is no fiscal policy adjustment to finance the increase of the CSG, and thus this increase, ceteris paribus, will increase government's deficit.

Table 10: Impact on consumer prices (in %)

	sim1	sim2	sim3
Meat	-0.15	-0.06	-0.22
Fish	0.25	0.12	0.42
Fruit & Vegetables	-0.10	-0.05	-0.16
Milk	0.02	0.02	0.06
Rice	-0.30	-0.13	-0.50
Starches	-0.12	-0.04	-0.16
Bread	0.04	0.03	0.09
Other food	-0.02	0.01	0.00
Beverages	0.06	0.05	0.13
Education	1.34	0.53	1.86
Other non-Food	0.00	0.00	0.00

Source: Results from the CGE

Before going into the poverty and inequality results, it is noteworthy to discuss briefly the budget cost of the different simulations proposed in this study. Simulation 1 would cost the Government 1.11% of GDP (in 2008 terms), while Simulation 2 and Simulation 3 would cost 1.15% and 1.38% respectively. All the scenarios would call for a significant (probably unrealistic in the case of sim3) effort by the Government in terms of budget increase, as in 2008 the CSG programme cost 0.93% of GDP.

Table 11 to Table 17 report the results for poverty gaps and the inequality Gini index, by different groups. Table 11 and Table 12 shows that P0, P1 and P2 decrease in comparison with the base year for the whole population and for children respectively. The improvement is particularly strong for poverty severity. As expected from the small changes in the relevant variables discussed above, the multiplier effects on the economy (namely changes in prices, incomes and employment) – other than the direct effect brought by the change in the CSG – have practically no further effects on households' welfare. In addition, for the national population, simulations 1 and 2 do not differ substantially, with poverty incidence under the "+ two million beneficiaries" (sim2) decreasing from 53.2 (base year) to 52.6 per cent (versus 52.8 under the "+20% of CSG value" – sim1). This is not the case for P1 and P2, for which the two scenarios do not differ in terms of effectiveness of poverty reduction; P1 and P2 go respectively from 0.261 and 0.156 (base year) to 0.250 and 0.145 (under both sim1 and sim2). Gini index decreases from 0.687 (base year) to 0.682 (under both sim1 and sim2). As expected, under sim3, poverty and inequality decrease substantially. According to our simulations, P0 would decrease by 1.3 percentage points, while P1, P2 and Gini by 2.4, 2.3 and 1.1 respectively. If the multiplier effects are not taken into account, poverty incidence, poverty gap, poverty severity as well as the Gini index, do not change.

Poverty and inequality effects primarily depend on the distribution of CSG across the different population groups; the distribution of CSG beneficiaries observed in the base year will affect the results associated with sim1, while the simulated increase in the number of beneficiaries by 2 million will be reflected on the results for sim2. As for sim1, Limpopo, together with Eastern Cape, as expected, show the largest poverty reduction as they are the provinces with the largest share of CSG beneficiaries at the base year (see Table 17). This will

be the case also for households living in tribal authorities and for the African population group. Concerning sim2, Northern Cape is the province where the largest increase in the number of additional beneficiaries (in percent and in percentage points) is simulated, as well as for the African population group (see Table 17, below). Of course, the final results on the incidence of poverty will critically depend on the distribution of CSG (observed and simulated) of those around the poverty line, while changes in Gini inequality index will be affected primarily by the changes occurring for those in the middle of the expenditure distribution.

Results by provinces (as shown in Table 12 below) reveal a heterogeneous impact linked to the CSG reform. In most cases, the same trends as in the national figures are observed, except for Northern Cape where under sim2, there is a deterioration – although small – in inequality when multiplier effects are included.

As expected, African and Coloured households benefit the most from the CSG proposed reforms, while Whites are not affected (see Table 14 in Appendix 4). Interestingly, Indians largely benefit from a 20 percent increase in the value of the CSG in terms of headcount poverty reduction as a large part of households receiving the CSG are around the poverty line (see Figure 6 in Appendix 4). Rural formal, tribal authority and urban informal improve their households' welfare under both simulation scenarios; poverty is not affected for households living in formal urban areas under sim1 but is reduced under sim2 (see Table 15 in Appendix 4). However, in sim2, contrary to what is observed elsewhere, results are less effective than sim1 in reducing P0 as a large part of new beneficiaries under sim2 are too far from the poverty line. Finally, poverty among children is so widespread that the proposed policy reforms are not capable of substantially impacting child poverty and welfare in general (see Table 16 in Appendix 4). Under sim2 children living in households who were not CSG beneficiaries at the base year substantially improve their welfare. This is reflected in the change in P0, which moves from 0.545 to 0.532.

The monthly cost of 1 percentage point reduction in poverty gap (P1) amongst children is: for sim1, R204 950 019; for sim2, R234 965 035 and for sim3, R222 991 915. From these results, we can conclude that Sim1 is the most cost effective of the policies.

Table 11: Poverty Incidence, gap and severity and Gini index for base year, sim1, sim2 and sim3, whole population

	Reference Situation	Sim 1		Sim2		Sim 3	
		w/ multiplier effect	w/o multiplier effect	w/ multiplier effect	w/o multiplier effect	w/ multiplier effect	w/o multiplier effect
P0	0.532	**0.528**	0.528	**0.526**	0.526	**0.518**	0.518
P1	0.261	**0.250**	0.250	**0.250**	0.250	**0.237**	0.237
P2	0.156	**0.145**	0.145	**0.145**	0.145	**0.133**	0.133
Gini	0.687	**0.682**	0.682	**0.682**	0.682	**0.676**	0.676

Source: authors' estimation based on NIDS 2008
Note: figures in bold indicates the cases where the difference between the reference situation is statistically different from zero. As for figures not including the multiplier effect, the difference is calculated with respect to the corresponding scenario including the multiplier effect. Statistical tests, as well as P0, P1, P2 and Gini figures, are run with the DASP statistical package (Araar and Duclos, 2007).

Table 12: Poverty Incidence, gap and severity and Gini index for base year, sim1, sim2 and sim3, children

	Reference Situation	Sim 1		Sim2		Sim 3	
		w/ multiplier effect	w/o multiplier effect	w/ multiplier effect	w/o multiplier effect	w/ multiplier effect	w/o multiplier effect
P0	0.655	**0.649**	0.649	**0.647**	0.647	**0.634**	0.634
P1	0.338	**0.321**	0.321	**0.320**	0.320	**0.299**	0.299
P2	0.206	**0.188**	0.188	**0.190**	0.190	**0.170**	0.170
Gini	0.681	**0.672**	0.672	**0.672**	0.672	**0.662**	0.662

Source: authors' estimation based on NIDS 2008
Note: figures in bold indicates the cases where the difference between the reference situation is statistically different from zero. As for figures not including the multiplier effect, the difference is calculated with respect to the corresponding scenario including the multiplier effect. Statistical tests, as well as P0, P1, P2 and Gini figures, are run with the DASP statistical package (Araar and Duclos, 2007).

Table 13: Poverty Incidence and Gini index for base year, sim1, sim2 and sim3 (by province), whole population

	Reference situation		sim1 w/ multiplier effect		sim1 w/o multiplier effect		sim2 w/ multiplier effect		sim2 w/o multiplier effect		sim3 w/ multiplier effect		sim3 w/o multiplier effect	
	P0	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**
Western Cape	0.324	0.634	0.323	0.633	0.323	0.633	0.322	0.633	0.322	0.633	0.320	0.631	0.320	0.631
Eastern Cape	0.731	0.679	0.727	0.669	0.727	0.669	0.724	0.670	0.724	0.670	0.714	0.658	0.714	0.658
Northern Cape	0.428	0.561	0.423	0.557	0.423	0.557	0.420	0.554	0.420	0.555	0.413	0.549	0.413	0.549
Free State	0.517	0.618	0.510	0.612	0.510	0.612	0.516	0.613	0.516	0.613	0.508	0.606	0.508	0.606
KwaZulu Natal	0.700	0.771	0.692	0.765	0.692	0.765	0.697	0.766	0.697	0.766	0.688	0.758	0.688	0.758
North West	0.493	0.638	0.486	0.633	0.486	0.633	0.487	0.633	0.487	0.633	0.481	0.627	0.481	0.627
Gauteng	0.319	0.605	0.318	0.603	0.318	0.603	0.312	0.602	0.312	0.602	0.303	0.599	0.303	0.599
Mpumalanga	0.462	0.651	0.461	0.647	0.461	0.647	0.451	0.647	0.451	0.647	0.448	0.642	0.448	0.642
Limpopo	0.692	0.648	0.688	0.638	0.688	0.638	0.683	0.640	0.683	0.640	0.672	0.628	0.672	0.628

Source: authors' estimation based on NIDS 2008
Note: Here we do not show statistical test for the difference of P0 and Gini figures as we took as the primary sampling unit variable (used to set the complex data survey) corresponds to the province variable. P0 and Gini figures are run with the DASP statistical package (Araar and Duclos, 2007).

6 Conclusion and implications

The paper set out to assess the impact of the CSG on the South African economy. The rationale for this study arose from the fact that although the positive impacts of the CSG on recipients are widely acknowledged very little is known about the economy-wide impacts of the grant. Furthermore, the grant forms a significant component of the government's total welfare expenditure.

To quantify the impact of the CSG on the South African economy a bottom up/top-down modelling approach was used. A micro-simulation model is used in the first instance to estimate consumer prices and income elasticities and the simulation of the effect of a change in CSG on consumption patterns. This was followed by estimation of a model for labour force participation and simulation of the effect of a change in the CSG on labour force participation. In the second stage the relevant changes were estimated and then transmitted to the macro (CGE) model. This simulated changes in different variables which were then inserted into the micro module in order to produce changes in poverty and inequality following the reform in the CSG scheme. After specification of the model, three simulations were conducted based on two future developments regarding the CSG; an increase in the value of the grant and an increase in the number of grant recipients in line with current policy discussions around extending coverage to 2 million children who are currently not being covered. Sim1 simulated an increase in the value of the CSG by 20% for people already benefiting from the transfer. Sim2 saw an increase in the number of beneficiaries by 2 million whilst sim3 combined the two simulations.

The results of the labour force participation model found that there was a positive link between the CSG and the probability of participating in the labour force. With respect to the responses of the 12 products to own price, expenditure and the CSG the results showed the lack of uniformity across product categories. Fruit and vegetables, rice, starches and beverages are more responsive to a percent change in their price while the own price elasticity for other non-food items is -0.84. The results seem to suggest that increases in the CSG will have a profound impact on education and other non-food items. Not only are these found to be superior goods since their demand increases by 1.70% (education) and 1.17% (non-food) after a percent increase in household expenditure, but there are the only ones with a statistically significant elasticity, 1.17% (education) and 1.11% (non-food). The results from the CGE model are encouraging as they show that there is an increase in the consumption and production of education and the nutritious fish product. The positive impact on the labour market together with the increase in the transfers received by households, results in an increase in their income. There is an increase in government's income due to the increase in direct taxes, consumption and production taxes. However, given the increase in its transfers (i.e. the increase of the CSG), government's savings decrease which leads to a decrease in total investment. Given that the 2008 CSG programme cost 0.93% of GDP all three simulations impose a significant cost on government with sim1

costing 1.11% of GDP (in 2008 terms), while sim2 and sim3 would cost 1.15% and 1.38% respectively.

When it comes to poverty measures and inequality, the results show that, other than the direct effects brought by the change in the CSG the multiplier effects have no further impacts on household welfare. Relative to the base year there is a strong improvement in the poverty incidence, gap, severity and Gini index for the whole population and for children, although it is particularly strong for poverty severity. Although poverty incidence differs slightly under sim1 and sim2 for the national population in the two scenario, changes in effective poverty reduction and inequality remained the same under both simulations. However, as expected, under sim3, poverty and inequality decrease substantially.

At a regional level, the results showed heterogeneous impacts linked to the CSG reform with the same trends as in the national figures being observed, except for Northern Cape where under sim2, there is a deterioration, although small, in inequality when multiplier effects are included. The results also showed that in terms of race, African and Coloured households benefit the most from the CSG proposed reforms, while Whites are not affected. Indians largely benefited from a 20 percent increase in the value of the CSG in terms of headcount poverty reduction as a large part of households receiving the CSG are around the poverty line.

Based on geographical zones the results showed that rural formal, tribal authority and urban informal improve their households' welfare under both simulation scenarios; poverty is not affected for households living in formal urban areas under sim1 but is reduced under sim2. However, in sim2, contrary to what is observed elsewhere, results were less effective than sim1 in reducing poverty incidence as a large part of new beneficiaries under sim2 are too far from the poverty line. Finally, poverty among children is so widespread that the proposed policy reforms are not capable of substantially impacting child poverty and welfare in general. Under sim2 children living in households who were not CSG beneficiaries at the base year substantially improve their welfare. This is reflected in the change in poverty incidence, which moved from 0.545 to 0.532. The cost of 1 percentage point reduction in poverty gap amongst children is: for sim1, R204 950 019; for sim2, R234 965 035 and for sim3, R222 991 915. From these results, we can conclude that Sim1 is the most cost effective of the policies.

7 REFERENCES

Annabi, N., Decaluwé, B., and Cockburn, J. (2006), "Functional forms and parameterization of CGE models", PEP, MPIA Working Paper 2006-04.

Aliber, M., (2001) *Study of the Incidence and Nature of Chronic Poverty and Development Policy in South Africa: An Overview.* Programme for Land and Agrarian Studies and Chronic Poverty Research Centre. May 2001

Ardington, C., Case A., and Hosegood V. (2009),"Labor Supply Responses to Large Social Transfers: Longitudinal Evidence from South Africa." *American Economic Journal: Applied Economics*, 1(1): 22–48.

Argent, J., Finn A., Leibbrandt M., and Woolard I. (2009), "Poverty: Analysis of the NIDS Wave 1 Dataset", National Income Dynamics Study, *NiDS Discussion Paper* No.12

Araar, A and Duclos J.Y., (2007), "DASP: Distributive Analysis Stata Package", PEP, World Bank, UNDP and Université Laval.

Behar, A., and Edwards, L. (2004), "Estimating elasticities of demand and supply for South African manufactured exports using a vector error correction model", The Centre for the Study of African Economies, Working Paper 204

Bertrand, M., Mullainathan S., and. Miller D., (2003), "Public Policy and Extended Families: Evidence from Pensions in South Africa." World Bank Economic Review, 17(1): 27–50.

Blank, R. (2004): *What did the 1990s welfare reform accomplish?* Paper prepared for the Berkeley Symposium on Poverty and Demographics, the Distribution of Income, and Public Policy. Michigan, University of Michigan (Gerald R Ford School of Public Policy).

CASE, 2000. Phasing in the child support grant, A social impact study prepared for the Department of Welfare by the Community Agency for Social Enquiry (CASE) (July 2000)

Case, A., Hosegood, V., Lund, F. (2005), The reach and impact of Child Support Grants: evidence from KwaZulu-Natal Development Southern Africa Vol. 22, No. 4, October 2005

Chitiga, M., Decaluwé B., Mabugu R., Maisonnave, H., V. Robichaud, Sheppard, D., Von Fitel, D. and Van der Berg S. (2010), "The impact of the international crisis on child poverty in South Africa", Stellenbosch Economic Working Papers:13/10, available at www.ideas.repec.org/p/sza/wpaper/wpapers112.htlm

Das, J., Do, Q.T., and Özler, B. (2005): Reassessing conditional cash transfer programs. *World Bank Research Observer* 20: 57-80.

Davies R. and Thurlow, J. (2011) A 2005 Social Accounting Matrix for South Africa. Washington DC, USA: International Food Policy research Institute

Decaluwé, B, Lemelin, A, Maisonnave, H. and Robichaud, V. (2009), The Pep Standard Computable General Equilibrium Model Single-Country, Static Version PEP-1-1, Poverty and Economic Policy Network, available on line at http://www.pep-net.org/uploads/media/PEP-1-1_v1_1.pdf.

Devereux, S. (2002): "Can social safety nets reduce chronic poverty?" *Development Policy Review* 20(5): 657-675.

Duclos, J.-Y. and A. Araar (2006) *Poverty and Equity Measurement, Policy, and Estimation with DAD*, Berlin and Ottawa: Springer and IDRC.

Eyal, K. and Woolard, I. (2011), Throwing the Book at the CSG, South African Labour and Development Research Unit, Working Paper series 53.

Gibson, K.L. (2003), Armington Elasticities for South Africa: Long- and Short-Run Industry Level Estimates, Trade and Industrial Policy Strategies, Working Paper 12-2003

Hudson, J. and Kühner, S. (2009), "Towards productive welfare? A comparative analysis of 23 OECD countries", *Journal of European Social Policy*, 19(1): 34-46.

Kildal, N., (2001), *Workfare tendencies in Scandinavian welfare policies*, International Labour Office, Geneva.

King, M.A. (1983) "Welfare analysis of tax reforms using household data" *Journal of Public Economics*, 21, 183–214.

Laryea-Adjei, G., Devereux, S. and Motepe, M. (2011) Impact evaluation of South Africa's Child Support Gant on Child Protection: A Qualitative Review

Lewbel, A. and Pendakur, K. (2009) "Tricks with Hicks: The EASI Demand System", *The American Economic Review* 99(3), 827-863

Lund, F. (2008) Changing Social Policy. The Child Support Grant in South Africa, Human Sciences Research Council (HSRC) Press 2008

McEwan, H. and Woolard, I. (2010), The Changing Dynamics of Child Grants in South Africa in the Context of High Adult Mortality, Presentation made to Overcoming Inequality and Structural Poverty in South Africa: Towards inclusive growth and development, September 2010

Samson, M.J. (2002): The social, economic and fiscal impact of comprehensive social security reform for South Africa, *Social Dynamics*, 28:2, 69-97

Ochel, W. (2006), “Welfare-to-work experiences with specific work-first programmes in selected countries”. *International Social Security Review*, 58(4): 67-93.

Rawlings, L. (2005), “A new approach to social assistance: Latin America's experience with conditional cash transfer programmes”. *International Social Security Review* 58(2/3): 133-161.

Patel, L., Hochfeld, T., Moodley, J., and Mutwali, R. (2012) The Gender Dynamics and Impact of the Child Support Grant in Doornkop, Soweto CSDA Research Report. Johannesburg: Centre for Social Development in Africa, University of Johannesburg, CSDA Research Report. Johannesburg

Pendakur, K. “EASI made Easier”(2008), www.sfu.ca/pendakur/EASI made Easier.pdf

Posel, D, Fairburn J.A., and Lund F,. (2006), “Labour Migration and Households: A Reconsideration of the Effects of the Social Pension on Labour Supply in South Africa.” *Economic Modelling*, 23(5): 836–53.

Republic of South Africa 1996 Constitution of the Republic of South Africa

Samson, M., Rosenblum, D., Haarmann, C., Haarmann, D., MacQuene K. and van Niekerk, I. (2001): *The socio-economic impact of "workfare": welfare reform lessons from the United States and other international experiences*. *Research Paper No 26*. Cape Town: Economic Policy Research Institute (EPRI).

Sadoulet, E., Davis, B., and de Janvry, A., (2001): "Cash transfer programs with income multipliers," Food Consumption and Nutrition Division (FCND) discussion papers 99, International Food Policy Research Institute (IFPRI).

South African Social Security Agency (SASSA), June 2010. Fact Sheet Issue No 1: A statistical summary of social grants transfers in South Africa

South African Social Security Agency (SASSA), 2011. Third Quarter Indicator Report October to December 2011

Seeking, J. (2007) Deserving individuals and groups: Justifying the shape of South Africa’s Welfare State; Centre for Social Science Research (CSSR), Social Surveys Unit, Working Paper 193, May 2007

Standing, G. (1990): The road to workfare: alternative to welfare or threat to occupation? *International Labour Review*, 129(6): 677-691.

Stats SA (2008), Consumer price index, (Various publications), available at http://www.statssa.gov.za/cpi/index.asp

Tesliuc, E. (2005), “Social safety nets in OECD countries”. *Social Safety Nets Primer Notes No 25*. Washington, D.C.: The World Bank.

Triegaardt J. D. (2005) The Child Support Grant in South Africa: a social policy for poverty alleviation?, International Journal of Social Welfare, Volume 14, Issue 4, pages 249–255

Van der Berg, S., and Siebrits, F.K. (2010): *Social assistance reform during a period of fiscal distress*. Paper prepared for the Financial and Fiscal Commission. Midrand: South Africa.

Williams, M. J. and Samson, M. (2007), ‘The Social and Economic Impacts of South Africa’s Child Support Grant’.

Wooldridge, J. (2010) *Econometric Analysis of Cross Section and Panel Data*, MIT Press

APPENDIX 1: SELECTION OF THE NEW 2 MILLION CSG BENEFICIARIES

We first estimated among age eligible children the probability of receiving the CSG through a probit model

$$probit(\pi_i) = \alpha + \beta_v X_i + \varepsilon_i \quad (12)$$

with

$$\pi_i = E\left(Y_i \middle| X_i\right) \quad (13)$$

Where Y_i is a binary variable taking value 1 if the child receives the grant, 0 otherwise. Vector X_i identifies a group of *V* individual and household characteristics affecting the effective reception of the grant, namely child's age (and its square value), his/her gender, the education level of his/her household head, the log of the per capita income, his/her household size, the geo-type, the province, whether he/she has a birth certificate, his/her ethnicity, whether his/her mother is alive and whether she lives with the child.

The estimated coefficients are then used to predict the probabilities of receiving the CSG. The new two million beneficiaries are finally chosen among age eligible children, not receiving the grant at the base year, and showing the highest probability to receive it. Only children up to 13 years old (included) have been retained for this simulation. Although the current age eligibility is up to 14 included, once reached the age of 14 years old, a child is very unlikely to become a new beneficiary.

APPENDIX 2: CALCULATION OF THE EQUIVALENT INCOME

The equivalent income $e_{c,h}$ is the level of income, at the reference price p_r, ensuring the same utility level than that obtained with the income level $x_{c,h}$ and the price system p_c :

$$v\left(p_c, x_{c,h}\right) = v\left(p_r, e_{c,h}\right) \tag{14}$$

where *v (.)* is the indirect utility function and p_r is the reference price system. By reversing the indirect utility function, we obtain the equivalent income in terms of expenditure function:

$$e_{c,h} = e\left(p_r, p_c, x_{c,h}\right) \tag{15}$$

where $e_{c,h}$ is the equivalent income of household *h* living in stratum *c*, facing the p_c system prices, and enjoying a level of nominal income per capita (or per adult equivalent) $x_{c,h}$. The function $e_{c,h} = e\left(p_r, p_c, x_{c,h}\right)$ is increasing with respect to p_r and $x_{c,h}$, decreasing with respect to p_c, concave and homogeneous of degree one with respect to the reference price, and is continuous with first and second derivatives for all arguments (King, 1983).

Consider the cost function of the EASI class:

$$\ln C\left(p,u,z\right) = u + \sum m^j\left(u,z\right)\ln p^j + \frac{1}{2}\sum\sum a_{jk}\ln p^j \ln p^k \tag{16}$$

where *u* is the implicit utility[10], *p* is the J-vector of prices p=[p_1 , p_J], and *z* demographic characteristics[11]. By Shepard's Lemma, the Hicksian budget-share functions are:

$$w^j\left(p,u,z\right) = m^j\left(u,z\right) + \sum a_{jk}\ln p^k \tag{17}$$

where $a_{jk} = a_{kj}$ for all *j, k*. Implicit utility is given by :

$$y = u = \ln x - \sum w_j \ln p^j + \frac{1}{2}\sum\sum a_{jk}\ln p^j \ln p^k \tag{18}$$

Where $\ln x - \sum w_j \ln p^j$ is the log of stone-index deflated nominal expenditures. From (17), we have :

[10] This utility is implicitly defined in terms of observable variables, namely expenditures *x*, prices p_1, ..., p_J and budget-shares in w_1, ...w_j.
[11] The first element of *z* is 1.

$$m^j(u,z) = w^j(p,u,z) - \sum a_{jk} \ln p^k \tag{19}$$

By substituting (19) in (16), we have:

$$\ln C(p,u,z) = u + \sum \left(w^j(p,u,z) - \sum a_{jk} \ln p^k \right) \ln p^j + \frac{1}{2} \sum \sum a_{jk} \ln p^j \ln p^k \tag{20}$$

With total per capital nominal expenditures $x_{c,h}$ and prices p_c we enjoy a level of utility u_0:

$$u_{c,h} = \ln x_{c,h} - \sum w^j \ln p_c^j + \frac{1}{2} \sum \sum a_{jk} \ln p_c^j \ln p_c^k \tag{21}$$

We finally get the equivalent income $e_{c,h}$ by solving :

$$\ln C(p_r,u,z) = \ln e_{c,h} = u_{c,h} + \sum \left(w^j(p_r,u,z) - \sum a_{jk} \ln p_r^k \right) \ln p_r^j + \frac{1}{2} \sum \sum a_{jk} \ln p_r^j \ln p_r^k \tag{22}$$

from where:

$$e_{c,h} = \exp\left(\ln x_{c,h} - \sum_{j=1}^{J} w^j \left(\ln p_c^j - \ln p_r^j \right) + \frac{1}{2} \sum_{j=1}^{J} \sum_{k=1}^{K} a_{j,k} \left(\ln p_c^j \ln p_c^k - \ln p_r^j \ln p_r^k \right) \right) \tag{23}$$

Appendix 3: calculation of elasticities

a) Calculation of price elasticities in the EASI system

Consider the EASI implicit marshallian demand system:

$$w^j = \sum b_r^j y^r + \sum g_t^j z_t + \sum a_{jk} \ln p^k \tag{24}$$

where :

$$y = \ln x - \sum w^j \ln p^j + \frac{1}{2} \sum \sum a_{jk} \ln p^j \ln p^k \tag{25}$$

and

$$w^j = \frac{p_j q_j}{x} \tag{26}$$

we have :

- p_j = nominal price of good j,
- q_j = amount of good j,
- x= total expenditure.

So, we have :

$$\frac{\partial Q_j}{\partial p_i} = \frac{\partial \frac{x w_j}{p_j}}{\partial p_i} + \frac{x}{p_j} \frac{\partial w_j}{\partial p_j} \tag{27}$$

Moreover:

$$\frac{\partial w_j}{\partial p_i} = \left(-\frac{w_j}{p_i} + \frac{\sum a_{jk} \ln p_k}{p_i} \right) \sum r b_r^j y^{r-1} + \frac{a_{ji}}{p_i} \tag{28}$$

This allows to write :

$$\frac{\partial Q_j}{\partial p_i} = \frac{Q_j}{p_i} \left(\frac{\partial \left(\frac{x w_j}{p_j} \right)}{\partial p_i} + \frac{\partial w_j}{\partial p_i} \frac{p_i}{w_j} \right) \tag{29}$$

Hence, the elasticity of good j with respect to income e_j^i is:

$$e_j^i = -1 * (i = j) + \left(\frac{\sum a_{jk} \ln p_k}{w_j} - \frac{w_i}{w_j} \right) \sum r b_r^j y^{r-1} + \frac{a_{ji}}{w_j} \tag{30}$$

b) Calculation of income elasticities in the EASI system

If we consider (24), (25) and (26) we have:

$$\frac{\partial Q_j}{\partial x} = \frac{1}{p_j} w_j + \frac{x}{p_j} \frac{\partial w_j}{\partial x} \tag{31}$$

Moreover:

$$\frac{\partial w_j}{\partial x} = \frac{\sum r b_r^j y^{r-1}}{x} \tag{32}$$

It follows that:

$$\frac{\partial Q_j}{\partial x} = \frac{1}{p_j} w_j + \frac{x}{p_j} \frac{\sum r b_r^j y^{r-1}}{x} \tag{33}$$

Hence, the elasticity of good j with respect to income e_j^x is:

$$e_j^x = 1 + \frac{\sum r b_r^j y^{r-1}}{w_j} \tag{34}$$

APPENDIX 4: ADDITIONAL TABLES

Table 14: Poverty Incidence and Gini index for base year, sim1 and sim2 (by main ethnicity), population

	Reference situation		sim1 w/ multiplier effect		sim1 w/o multiplier effect		sim2 w/ multiplier effect		sim2 w/o multiplier effect		sim3 w/ multiplier effect		sim3 w/o multiplier effect	
	P0	Gini	P0	Gini	P0	Gini	P0	Gini	P0	Gini	P0	Gini	P0	Gini
African	0.625	0.597	**0.621**	**0.588**	0.621	0.588	**0.618**	**0.589**	0.618	0.589	**0.610**	**0.579**	0.610	**0.579**
Coloured	0.315	0.566	**0.314**	**0.564**	0.314	0.564	**0.309**	**0.563**	0.309	0.563	**0.306**	**0.560**	0.306	0.560
Asian/Indian	0.173	0.526	**0.135**	**0.525**	0.135	**0.525**	0.173	0.526	0.173	**0.526**	**0.135**	**0.525**	0.135	0.525
White	0.029	0.456	0.029	0.456	0.029	0.456	0.029	0.456	0.029	0.456	0.029	**0.456**	0.029	0.456

Source: authors' estimation based on NIDS 2008
Note: figures in bold indicates the cases where the difference with the reference situation is statistically different from zero. As for figures not including the multiplier effect, the difference is calculated with respect to the corresponding scenario including the multiplier effect. Statistical tests, as well as P0 and Gini figures, are run with the DASP statistical package (Araar and Duclos, 2007).

Table 15: Poverty Incidence and Gini index for base year, sim1, sim2 and sim3 (by geo-type zone), population

	Reference situation		sim1 w/ multiplier effect		sim1 w/o multiplier effect		sim2 w/ multiplier effect		sim2 w/o multiplier effect		sim3 w/ multiplier effect		sim3 w/o multiplier effect	
	P0	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**
Rural formal	0.601	0.593	0.584	**0.587**	0.584	0.587	**0.592**	**0.586**	0.592	0.586	**0.574**	**0.578**	0.574	0.578
Tribal Authority	0.815	0.499	**0.809**	**0.484**	0.809	0.484	**0.808**	**0.488**	0.808	0.488	**0.797**	**0.471**	0.797	**0.471**
Urban formal	0.305	0.635	0.304	**0.633**	0.304	0.633	**0.301**	**0.633**	0.301	0.633	**0.300**	**0.631**	0.300	0.631
Urban informal	0.626	0.488	0.619	**0.479**	0.619	0.479	**0.616**	**0.479**	0.616	**0.479**	**0.598**	**0.469**	0.598	**0.469**

Source: authors' estimation based on NIDS 2008
Note: figures in bold indicates the cases where the difference with the reference situation is statistically different from zero. As for figures not including the multiplier effect, the difference is calculated with respect to the corresponding scenario including the multiplier effect. Statistical tests, as well as P0 and Gini figures, are run with the DASP statistical package (Araar and Duclos, 2007).

Table 16: Poverty Incidence and Gini index for base year, sim1, sim2 and sim3 (by recipient households), children

	Reference situation		sim1 w/ multiplier effect		sim1 w/o multiplier effect		sim2 w/ multiplier effect		sim2 w/o multiplier effect		sim3 w/ multiplier effect		sim3 w/o multiplier effect	
	P0	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**	**P0**	**Gini**
Non-CSG Recipient	0.458	0.670	**0.453**	**0.667**	0.453	0.667	**0.441**	**0.662**	0.441	0.662	**0.430**	**0.657**	0.430	0.657
CSG Recipient	0.813	0.449	**0.806**	**0.432**	0.806	0.432	**0.812**	**0.439**	0.812	0.439	**0.798**	**0.420**	0.798	0.421
Total	0.655	0.681	**0.649**	**0.672**	0.649	0.672	**0.647**	**0.672**	0.647	0.672	**0.634**	**0.662**	0.634	0.662

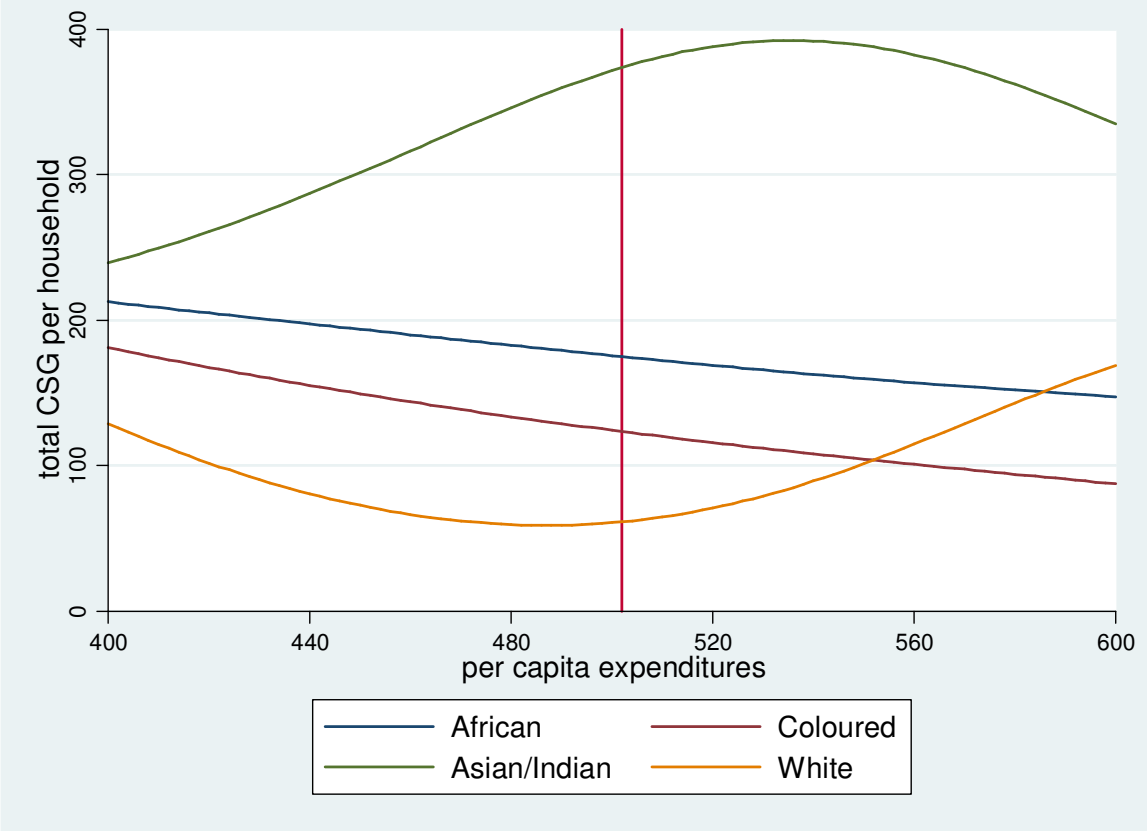
Source: authors' estimation based on NIDS 2008
Note: figures in bold indicates the cases where the difference with the reference situation is statistically different from zero. As for figures not including the multiplier effect, the difference is calculated with respect to the corresponding scenario including the multiplier effect. Statistical tests, as well as P0 and Gini figures, are run with the DASP statistical package (Araar and Duclos, 2007).

Table 17: Distribution of CSG (observed at the base year and simulated according to sim2)

	base year	sim2
Province		
Western Cape	0.267	0.345
Eastern Cape	0.627	0.777
Northern Cape	0.512	0.688
Free State	0.521	0.667
KwaZulu-Natal	0.572	0.697
North West	0.562	0.719
Gauteng	0.433	0.569
Mpumalanga	0.521	0.633
Limpopo	0.646	0.796
geo-type zone		
Rural Formal	0.572	0.721
Tribal Authority	0.665	0.813
Urban Formal	0.362	0.468
Urban Informal	0.636	0.805
population group		
African	0.638	0.800
Coloured	0.319	0.394
Asian/Indian	0.160	0.160
White	**0.026**	**0.026**
National	**0.532**	**0.666**

Source: authors' estimation based on NIDS 2008

Figure 6: non-parametric distribution of total CSG (in Rand) per household (by population groups)



Source: authors' estimation based on NIDS 2008
Note: the figure was constructed with the DASP statistical package (Araar and Duclos, 2007).