CHAPTER 2

A Quantitative Analysis of the Impacts of Social Grants on Social Welfare and the National Economy

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2.1 Introduction

South Africa is an upper-middle-income country based on economic factors, such as gross domestic product (GDP) per capita and the structure of the economy, but its social indicators (such as life expectancy, infant mortality and quality of education) are closer to those of a lower-middle-income or even low-income country. Despite successive governments giving priority to reducing poverty and inequality since the end of apartheid in 1994, most studies confirm that income poverty increased between 1993 and 2000, since when it has declined only marginally (StatsSA, 2008; Ozler, 2007; Leibbrandt et al., 2010). Between 1993 and 2008, about 3.8 million more people were categorised as poor, with the increase being most striking in urban areas (Leibbrandt et al., 2010). Government officials often greet statistics such as these with scepticism, pointing to the substantial improvements in social protection coverage, the provision of a range of free services, and the national budget's growing allocation to social services. For example:

- The number of beneficiaries who receive non-contributory social grants rose from 2.9 million in 1994 to 13.4 million people in 2009, while the value of those grants increased from 2.9 per cent to 4.4 per cent of GDP over the same period (Leibbrandt et al., 2010:52).
- In 2010, 80 per cent of the elderly and 71 per cent of eligible children were estimated to receive grants.
- Since 1994, 15 million previously unserviced households have been connected to a formal water supply, while between 1993 and 2009 access to electricity for lighting increased by almost 60 per cent, to reach 82 per cent of all households (Bhorat et al., 2006).
- Estimates suggest that the value of free or subsidised services, which the South African government often refers to as the "social wage", was aboutR88 billion in 2004, or R587 per household per month[19] (Friedman and Bhengu, 2008).

In recent years, social grants have expanded greatly and are particularly aimed at poor families. In April 1998 the Child Support Grant (CSG) was introduced, replacing the child maintenance grant and contributing to South Africa's progressive realisation of the constitutional right to social security, as enshrined in Article 27 of Constitution (South Africa, 1996). The CSG is paid to the child's primary caregiver and is currently the most important form of assistance for children in poor families, offering some protection against poverty. The CSG has expanded greatly: until 2008 only children aged 0–13 years were eligible for the grant, which was then in 2009 extended to include children aged 14; since 2010 the age of eligibility is 18 years (SASSA, 2010). As of 31 March 2011, an estimated 10 977 000 beneficiaries receive the CSG, which since 1 April 2012 amounts to R280 per month (National Treasury, 2011). The importance and scale of the CSG mean

[19] The South African Rand was worth approximately $0.15 in 2004.

that any changes related to the grant will have an impact on the economy. This chapter assesses the impact of two potential policy changes as well as their combined effect: (1) the number of beneficiaries is likely to increase by two million (see Section 2.11); (2) the value of the grant is also expected to rise (see Section 2.2). Both these developments will have an impact on poverty severity, incidence and depth.

In the short to medium term, South Africa faces two fiscal imperatives: (a) fiscal consolidation is unavoidable; and (b) there is no room for the introduction of costly new social assistance programmes (but CSG commitments will be honoured). Against these imperatives, this chapter seeks to understand the economic impact on the South African economy of increasing the grant amount and of including the missed children in the "net". Evidence suggests that social grants have positive effects on inequality and the economy, and reduce poverty. However, the impact of social grants on productive efficiency in the economy is uncertain, and has not been systematically investigated. The perception that grants create dependency and perverse incentives has also not been investigated from an economy-wide perspective.

Using a bottom–up/top–down economy-wide modelling approach, the chapter identifies several documented channels for the macroeconomic and household-level impacts of social grants: (1) changes in labour supply of different household members; (2) investments of part of the funds into productive activities, which increase the beneficiary household's capacity to generate revenue; and (3) prevention of detrimental risk-coping strategies, such as distress sales of productive assets (selling at a loss), learner drop-out from schooling, and increased risky income-generation activities such as commercial sex, begging and theft. Research has also documented three types of local economy impacts: (1) transfers between beneficiary and ineligible households, (2) effects on local goods and labour markets, and (3) macroeconomic (growth) and multiplier effects on income and/or welfare. This chapter focuses on the last of these channels. The research question, which is inspired by knowledge in the literature and in practice, is: Do different size increases in transfer payments to the poor cause their consumption and investment to increase differentially? This chapter is structured as follows: Section 2 discusses the coverage of the CSG in South Africa in terms of the number of beneficiaries and the changes in eligibility over the years; Section 3 briefly reviews literature on the impact of social transfer programmes; Section 4 discusses the methodology and data used for this study; Section 5 discusses the results of the three simulations carried out; and Section 6 concludes and gives some recommendations.

2.2 Social Grants in South Africa

This section gives a brief overview of South Africa's CSG, focusing on its reach, expenditure and impact on both poverty and the lives of grant recipients.

2.2.1 Reach of the CSG

When the CSG was introduced, the goal was to reach three million children within five years. Fourteen years later the CSG has more than 10 million beneficiaries and is the largest social assistance programme in South Africa and one of the largest globally. Table 2 shows the number of beneficiaries, by type of social grant, from 2008 projected to 2015.

Table 2: Social Grants Beneficiary Numbers by Type and Province (2007/08–2014/15) in thousands

Type of grant	2008/09	2009/10	2010/11	2011/12	2012/13* Projec-tions	2013/14*	2014/15*	% Growth per year
Old-age	2.344	2.490	2.647	2724	2.773	2.835	2.881	3.5%
War veterans	2	1	1	1	1	1	1	-10.9%
Disability	1.372	1.299	1.212	1216	1.192	1.196	1.196	-2.3%
Foster care	476	489	490	598	671	769	874	10.7%
Care dependency	107	119	121	126	131	141	147	5.4%
Child support	8.765	9.381	10.154	10.903	11.301	11.549	11.659	4.9%
Total	**13.066**	**13.779**	**14.625**	**15.568**	**16.069**	**16.491**	**16.758**	**4.2%**

Source: National Budget Review (2012). * Projected numbers at fiscal year-end.

Table 2 shows clearly that the CSG has the highest number of beneficiaries, growing annually by 4.9 per cent over the period. This growth has continued despite many initial implementation challenges, including the lack of equipment in many offices, the under-staffing of welfare offices, a lack of uniformity in the application process across provinces and offices, problems with accessing vital registration documents (for example, identity documents and birth certificates), and difficulties in providing postal addresses (Eyal and Woolard, 2011).

Although the number of beneficiaries has increased over the years, many eligible children are not able to access the grant. More than 600 000 maternal orphans are not receiving any grant, a vastly higher proportion than for any other group (SALDRU, 2008), while disproportionately fewer younger children (0–2 years) and rural children are accessing the CSG (McEwan and Woolard, 2010). The Department of Social Development acknowledges that not all eligible children are receiving the CSG, citing a lack of documentation as the biggest barrier. According to SASSA, 2.1 million children (or 27 per cent of those eligible) did not receive the CSG in 2008 (DSD et al., 2012). Table 3 shows the CSG beneficiaries at the regional level. KwaZulu-Natal and the Eastern Cape have the highest number of children who benefit from the CSG, with children under seven years being the largest age group. The figures for these two provinces 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 –North West; NC – Northern Cape; WC – Western Cape.
Source: South African Social Security Agency, Third Quarter Indicator Report, December 2011.

Table 4 gives the age of eligibility and the value of the CSG between 1998 and 2012.

Table 4: Changes in Age Eligibility and Grant Value Progression of the CSG

Year	Age Eligibility	Grant Amount
1998 – 2000	Children under 7 years	R100
2001	Children under 7 years	R110
2002	Children under 7 years	R140
2003	Children under 9 years	R160
2004	Children under 11 years	R170
2005	Children under 14 years	R180
2008	Children under 15 years	?
2010	Children under 16 years	?
2011	Children under 17 years	R270
2012	Children under 18 years	R280

Source: Eyal et al (2011.)

Both the age of eligibility and the value of the CSG have increased over time. Between 1998 and 2000, children under the age of seven years were eligible for the grant, but thereafter the age limit increased gradually, reaching 18 years in 2012. From an original amount of R100, the grant has increased to R280 per month.

The CSG is based on the follow the child concept, which recognises the varied and fluid nature of the family structure in South Africa: the grant is not linked to a biological parent and can 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., 2012).

2.2.2 Spending on the CSG

In 2011/12, South Africa spent R96,703 million on social assistance, with a significant amount going towards the cost of the CSG (Table 5). The magnitude of the CSG expenditure in South Africa's social spending forms part of the motivation for this chapter. Total expenditure on social assistance represents approximately 3.5 per cent of GDP, an increase of 1.5 per cent since 1994 (Seekings, 2007; Laryea-Adjei et al., 2011).

Table 5: Social Grants Expenditure by Type and Province, (2007/08– 2013/14)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	% Growth
R million	**Actual**			**Revised estimate**	**Projected**			**per year**
Old-age	25.934	29.826	33.751	37.318	39.323	42.526	45.823	10.0%
War veterans	20	17	14	12	13	10	11	-9.8%
Disability	16.474	16.567	16.84	17.834	19.152	20.41	21.992	4.9%
Foster care	3.934	4.434	4.616	5.245	5.952	6.216	6.697	9.3%
Care dependency	1.292	1.434	1.586	1.948	1.857	2.107	2.27	9.9%
Child support	22.348	26.67	30.342	34.036	38.237	41.553	44.774	12.3%
Grant-in-aid	90	146	170	192	188	203	219	15.9%
Social relief of distress	623	165	174	118	165	183	197	-17.5%
Total	**70.715**	**79.26**	**87.493**	**96.703**	**104.888**	**113.208**	**121.982**	**9.5%**
Province								
Eastern Cape	12.557	13.914	15.281	16.761	18.119	19.556	21.073	
Free State	4.573	5.055	5.53	6.234	6.698	7.229	7.79	
Gauteng	8.289	9.39	10.539	11.871	13.03	14.063	15.153	
Kw aZulu-Natal	17.59	19.454	21.308	23.507	25.301	27.307	29.424	
Limpopo	9.656	10.855	11.986	12.318	14.111	15.231	16.41	
Mpumalanga	4.943	5.567	6.024	7.431	7.558	8.157	8.79	
Northern Cape	5.711	2.227	2.497	2.816	3.021	3.26	3.514	
North West	1.962	6.366	6.869	7.241	7.851	8.474	9.131	
Western Cape	5.434	6.432	7.46	8.524	9.199	9.93	10.698	
Total	**70.715**	**79.26**	**87.493**	**96.703**	**104.888**	**113.208**	**121.982**	

Source: National Budget Review (2012).

Seekings (2007) argues that South Africa is unique, as no other developing country redistributes as large a share of its GDP through social assistance programmes. More importantly, projections show that these costs will continue to rise (National Treasury, 2011) because the size and cost of the CSG is driven in the main by the progressive increases in the age limit and the adjustments to the means test threshold (Table 6).

Table 6: Child Grant Cost Projections (milions of Rands)

Year	Child Support Grant Cost
Jun-05	14 143
Jul-06	17 559
Aug-07	19 625
Sep-08	22 348
Oct-09	26 670
Nov-10	30 342
Dec-11	34 036
2012/13*	38 237
2013/14*	41 553
2014/15*	44 774

Source: National Budget Review 2009, 2011, 2012. * Projections.

2.3 Literature Review

The impact of cash transfers (CTs) on poverty ultimately depends on how poor people use the money. As cash is fungible, the fear is that recipients may squander CTs on "sin goods" and other luxuries, which has in the past led to policy-makers preferring in-kind transfers to CTs. Another crucial distinction is differentiating between what Devereux (2002) refers to as the "livelihood protection" and "livelihood promotion" effects of anti-poverty interventions. The former refers to consumption smoothing and the maintenance of minimum living standards, while the latter refers to sustainable poverty reduction (a longer-horizon concept). CTs have long been regarded as measures of livelihood protection during times of crisis, although recent research has started questioning this (Devereux, 2002). Yet another important strand of the literature has pointed to the importance of distinguishing between "direct" and "indirect" effects of CTs (Sadoulet et al., 2001). Direct effects are the intended impact of the programme, without taking into account any spill-over or general equilibrium effects. Indirect effects arise from the outcomes of the direct effects and can either enhance the direct impacts or create unintended consequences, which lead to other undesirable outcomes. While the intended direct impact of conditional and unconditional CTs (such as the CSG) are meant to improve the income of beneficiaries, the direction of impact for the indirect effects are not always easily predictable. To illustrate the interaction of direct and indirect effects of CTs, Sadoulet et al. (2001) make an example of credit and cash transfer programmes. The former is shown to have the direct effects of loosening up liquidity constraints and hopefully boosting the incomes of borrowers. It can also have the indirect outcome of increased school attendance, as a result of the children being relieved from work that competes with school. Various studies have explored the impact of grant income on the spending patterns of recipient households, particularly on nutrition; its incentive effects on savings; and its impact on the labour market as well as poverty.

2.3.1 Effects of Cash Transfers on Nutrition

A number of studies discuss the nutritional benefits for children of increased food expenditure resulting from the receipt of CSG and social pensions. Using children's height-for-age ratios as ex post indicators of nutritional inputs, Agüero et al. (2007) find that KwaZulu-Natal children benefited significantly from the CSG in the first three years of their lives. The Department of Social Development assessed the impact of the CSG on children, adolescents and their households using survey data from five provinces[20] and propensity score matching. The study found that receiving the CSG in the first two years of life increases the probability of a child's growth being monitored by 7.7 percentage points (statistically significant at 10 per cent level) and improved height-for-age scores for children whose mothers have more than eight grades of schooling (DSD et al., 2012). Yamauchi (2005) uses three rounds of the KwaZulu-Natal Income Dynamics Study to show that grant-financed nutritional improvements produced positive educational outcomes for children, including lowering the age when they start school, reducing grade repetition, and increasing grades obtained at the early stage of schooling. Williams (2007) shows that grants reduced significantly the probability of childhood hunger.

With regard to old-age pensions, Duflo (2003) used ordinary least squares and two stage least squares to measure the impact of the old-age pension programme on the anthropometric status of African children (aged 6–60 months). The study found that the grant recipient's gender has a big influence on his/her anthropometric status. When the recipient of the pension is female, the impact is greater on girls than on boys, with no impact when the recipient is male. Samson et al. (2004) and Lund (2006) corroborate these observations, finding that the probability of nutrition improvements was higher in families with female pension recipients than with male recipients. Most evidence appears to suggest that receiving CSG and old-age pensions encourages school attendance among recipient children (Case et al., 2005; Budlender and Woolard, 2006; Leibbrandt et al., 2010). The only exception is the study by the Community Agency for Social Enquiry (CASE, 2008) that reported no discernible difference for children aged between seven and 13 years who receive the grant and those who do not. The evidence is overwhelming that receipt of a grant has a positive effect on school attendance in absolute terms, although this must be nuanced by the fact that high-school enrolments and attendance rates in South Africa are already high, even in the absence of grants. Thus, as Budlender and Woolard (2006) point out, the evidence suggests that grant receipt reduces considerably school non-attendance.

2.3.2 Effects of Cash Transfers on Savings and Investment

Most international evidence indicates that the marginal propensity to save and the rate of return on investing using CTs are relatively high. Martinez (2005) found that pension transfers, which were invested in smallholder agriculture in Bolivia, increased food consumption by twice the amount of the transfer received. Therefore, by enhancing the ability of recipients to save and invest, CTs reduce detrimental risk-coping strategies, such as the selling of productive assets. In South Africa, evidence of the incentive effect of grants on savings is less clear, and complicated

[20] Eastern Cape, Gauteng, KwaZulu-Natal, Limpopo and Western Cape.

by the fact that the means test imposes an onerous effective marginal tax rate of 50 per cent on non-pension incomes exceeding R606 per month (Van der Berg and Siebrits, 2010). This suggests that the means-tested nature of the social old-age pension reduces the incentive for low-income earners to save for retirement (National Treasury, 2004). The actual impact of this disincentive on the savings decisions of lower-income workers remains unresolved. Nonetheless, there is some evidence of a positive effect of grants on savings. Using pension transfers as an example, Duflo (2003) found that both male and female old-age unconditional pension recipients saved on average 67.5 per cent of the transfer. The evidence for investment is equally compelling, with highly positive rates of return that households obtain on investing out of their CTs.

2.3.3 Effects of Cash Transfers on Labour Market Behaviour

The Unemployment Insurance Fund (UIF) is the main instrument used to provide unemployment benefits in South Africa. It is a contribution-based social insurance institution, which means that grants are only given to people whose employment has been terminated by the employer among the working-age population. The social assistance system has some impact on labour-market participation, although the channels are different from those predicted by conventional theory (distortion of the relative prices of work and leisure) (Van der Berg and Siebrits, 2010). A survey by the Human Sciences Research Council revealed that the poor prefer labour-market income to grant income (Noble et al., 2008). The grant system instead influenced labour supply through direct and induced effects on retirement decisions, household formation and job-search activities (Van der Berg and Siebrits, 2010). Direct effects (incentives actually faced by recipients) are largely influenced by the means test that discourages elderly people from working after reaching eligibility age (by imposing an effective marginal tax rate of 50 per cent on non-pension incomes referred to earlier). Disability grants also are subject to means tests, resulting in similar discouraging effects. The situation is worsened by the high levels of unemployment and other labour-market disadvantages faced by elderly and disabled South Africans – according to Van der Berg and Siebrits (2010), many members of these groups have limited skills, and reside in rural areas where job opportunities are scarce. Thus the difference between the disability grant and available market wages is small, implying little incentive for persons with disability to seek or take up paid work. Johannsmeier (2007) suggests that this is even more so for casual and temporary jobs.

The results of studies exploring the induced or indirect labour market effects of the South African social assistance system are rather mixed. Some conclude that social pensions have become a main source of support for unemployed South Africans of working age, especially in rural areas (see for example Case and Deaton, 1998; Keller, 2004; Klasen and Woolard, 2008). Social pensions delay labour market participation through various channels, including delays in new household formation by younger adults or discouraged job search by individuals now residing with families with pension income (Bertrand et al., 2003; Klasen and Woolard, 2008). Studies that include migrant absentees in the definition of households have found that pension income access does in fact stimulate job search (see for example Posel et al., 2006; Sienaert, 2008), particularly for women. Eyal and Woolard (2011) found the CSG had a positive effect on the labour force participation, employment probability and unemployment (conditional on being a participant) for Black mothers aged 20 to 45.

With respect to the old-age pension, Ardington et al. (2009) use longitudinal data to assess the labour supply responses of adults to changes in the old-age pensioners in the household. In order to analyse unobservable household and individual characteristics that might influence labour market behaviour, households and individuals are compared before and after pension receipt and pension loss. The results show the strategic role that CTs can play in facilitating job search. Following the receipt of the transfer, the study found an increase in employment among adults in the household, indicating that the CT was used to finance the cost involved in job search. Furthermore, in the case of prime-aged households with children, migration was made possible because the pensioners were able to take care of children while their parents looked for work. Similarly, Williams (2007) concludes that CSG influences positively labour-force participation by caregivers (but not their search behaviour or actual employment). All in all, CASE (2008) and Noble et al. (2008) conclude that the small value of the CSG means that significant labour-supply effects are unlikely.

2.3.4 Effects of Cash Transfers on Poverty

Although not all CT programmes succeed in reducing poverty, a significant body of international evidence shows that both conditional and unconditional CTs have a positive impact on poverty (see Rawlings, 2005; Grosh et al., 2008; Fiszbein and Schady, 2009; Arnold et al., 2011). Devereux (2002) conveniently identifies three causes of poverty that facilitate the discussion of the effects of CTs on poverty: chronic poverty, which is often associated with low productivity (due largely to unemployment or underemployment); transitory poverty, which is often due to vulnerability to temporary shocks and an inability to cope with such shocks; and dependency, which is often a major cause of poverty and related to personal characteristics such as old age, childhood or disabilities.

The conventional wisdom is that CTs are best designed to address dependency-related poverty. Indeed, the South African social assistance system was designed to mitigate dependency-related poverty, focusing on vulnerable groups falling outside the labour force (children and elderly and disabled people). A number of studies have shown that the grant system is effective largely because the grants are well targeted and have significant mitigating impacts on poverty. When the actual incidence of poverty is compared to the incidence that would have obtained if all households had earned zero income from social grants, studies found that social grants are effective at reducing poverty (Woolard, 2003; Armstrong et al., 2008; Armstrong and Burger, 2009). Other pieces of work focusing on the effects of specific grants (for example Case and Deaton, 1998; Barrientos, 2003) and the social grants system as a whole (for example Samson et al., 2004) come up with a similar conclusion. Some indirect corroborating evidence of the poverty-reducing impact of social grants is provided in Van der Berg et al. (2007, 2008), The Presidency (2009) and Leibbrandt et al. (2010). Amstrong and Burger (2009) show that the effects of social grants are sensitive to the poverty line chosen, with the higher poverty reductions being associated with the lowest poverty lines. These studies may provide compelling evidence, but they are based on a very strong assumption that social grants have no general equilibrium effects; in other words, that they have no effect at all on household behaviour in terms of labour supply, saving, household formation patterns and so on. As a result, the utilisation and incentive effects of grants are uncertain.

As discussed earlier, there does not seem to be widespread evidence that grants are used to finance undesirable consumption patterns or other undesirable behavioural effects. Instead, the CSG and old-age pension have been used to enhance the nutrition and schooling of children. These are likely to enhance those children's human capital and productivity in later years. Similarly, when migrant members are included in the definition of households, grants were found to have an impact not only on chronic poverty (through sharing of the proceeds and acting as a safety net), but also on labour-market participation, particularly of females and caregivers.[21]

Evidence is growing of the important role played by the CSG in mitigating the impacts of economic shocks on South African 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 analysis showed that female-headed households in traditional huts and informal backyard shacks were severely affected by the dual crisis, and also that households with CSGs fared better than households without. A number of studies have found that South Africa's CSG contributes to reducing poverty and to shielding children from adverse effects, particularly from the financial and economic crisis of 2008 and 2009 (Chitiga et al., 2010; Ngandu et al., 2010). According to SASSA (2011), in 2007 the CSG was responsible for a 9 per cent drop in child poverty. Therefore, the case is very strong for at least maintaining the existing, targeted social grants as an anti-poverty measure. What is less clear are the developmental effects of continuing coverage along the lines discussed in Sections 2.1 and 2.2, given that CT schemes in South Africa were not initially intended for such large numbers and even less for addressing developmental effects. Samson et al. (2004) are one of few studies to use an economy-wide model to assess the impact of the CSG on the South African economy. Using a micro-simulation model, they analysed the role of social assistance in reducing poverty and promoting household development, focusing on the effects on health, education, housing and vital services. The study used three different poverty measures: the poverty headcount measure, the relative poverty gap measure and the rand poverty gap measure. Three data sources were used to calibrate the model: the September 2000 Income and Expenditure Survey, the September 2000 Labour Force Survey, and administrative data from the Department of Social Development. The study identified 11 scenarios of possible social security reform, which were then modelled using seven different poverty lines. The reduction in the poverty headcount was found to range from two per cent (for the full take-up of the CSG among eligible children aged 0–7) to 5.6 per cent (for the full take-up of the CSG among eligible children aged 0–18). The results for the latter group show that nearly 12 million additional grants were created, an increase of over 2 500 per cent from baseline. The impact is to free more than 1.4 million individuals from poverty, approximately one million more than the CSG 0–7 years reform. Consistent with the poverty headcount, the CSG 0–18 years reform produces the greatest

[21] Seyisi and Proudlock (2009) assessed the impact on children and families of stopping the CSG at the age of 15 years, using testimonies collected from caregivers of children aged 14–18 years. What emerged was that, thanks to the CSG, families had been able to meet the nutritional and educational needs of their children. Families were using the grant to buy school uniforms, lunch, stationery, transport to and from school, and books. Moreover, although most of the caregivers qualified for school fees exemption, a significant number 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 of school. It was also clear that in cases where the primary caregivers were the grandparents of the child, the CSG offered relief to their old-age pensions, which allowed them to continue meeting their own needs, such as medical care.

impact on both destitution and the aggregate poverty gap, reducing them by 35.6 per cent and 58.7 per cent respectively. This chapter goes beyond the micro-simulation model used by Samson et al. (2004) and adopts a bottom–up/top–down modelling approach, which uses both a micro-simulation and computable general equilibrium models. [22]

2.4 Methodology

The household-level impacts of social grants come from:

1. changes in labour supply of different household members,
2. investing part of the funds in productive activities, which increase the beneficiary household's capacity to generate revenue, and
3. preventing detrimental risk-coping strategies such as distress sales of productive assets (selling at a loss), children dropping out of school, and increased risky income-generation activities such as commercial sex, begging and theft.

Research has also documented three types of local economy impacts:

1. transfers between beneficiary and ineligible households,
2. effects on local goods and labour markets and
3. multiplier effects on income and/or welfare.

This study focuses on the last of these impacts. The methodology developed is used to estimate the potential effects on the welfare of South African households as well as the national economy following a change in the CSG scheme. In particular, three simulation scenarios are presented as follows:

1. Simulation 1 (sim1): A 20 per cent increase in the value of the CSG for people already benefiting from the transfer.
2. Simulation 2 (sim2): An increase of two million in the number of beneficiaries (eligible children) – for more details on the selection of the new beneficiaries, see Appendix 1.
3. Simulation 3 (sim3): Combination of sim1 and sim2, so the additional beneficiaries from sim2 also benefit from a 20 per cent increase of the CSG from sim1.

As mentioned earlier, the two main justifications for the proposed simulations are: (1) the relatively little awareness of the economy-wide impact of social protection instruments, such as the CSG; (2) the strong possibility that plans are under way to accelerate reaching some two million eligible children who are not currently receiving the CSG because of mainly administrative reasons.

[22] The importance of incorporating such general equilibrium features is illustrated in a study by Davies and Davey (2007) that used a social accounting matrix approach to analyse the impact on the local economy of an emergency cash transfer programme in rural Malawi. This approach was used to try and capture the economy-wide impacts of the cash transfer on the local economy. Using the minimum requirements method to compute the multipliers, the study found multiplier estimates between 2.02 and 2.45. The cash transfer programme was found to have extensive multiplier effects on employment and local economic activities. Specifically, small farmers and businesses, together with health and education, benefited from the secondary effects of the transfers. The ability of this type of economy-wide framework to pick up second-round effects of transfers highlights the role that computable general equilibrium models can play in assessing the full impact of changes to the transfer.

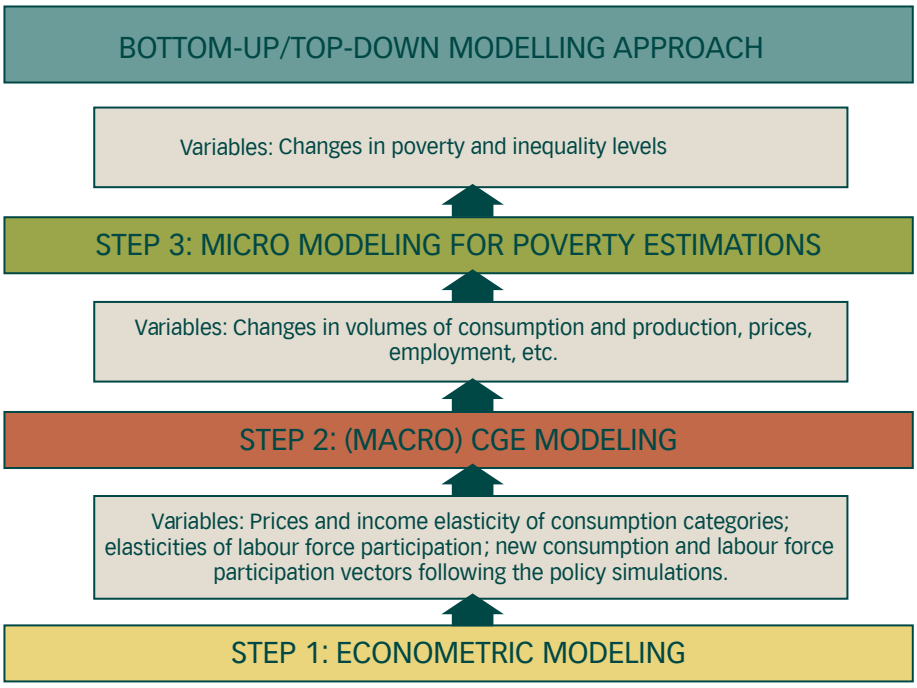
Figure 4 summarises the modelling framework. Conceptually, the modelling process starts with Step 1, which consists of micro-simulation modelling. Here the following variables will be estimated and fed into the computable general equilibrium (CGE) model:

a) Estimation of consumer prices and income elasticities, and simulation of the effect of a change in CSG on consumption patterns.

b) Estimation of a model for labour force participation, and simulation of the effect of a change in the CSG on labour force participation.

The relevant changes are then transmitted to the macro (CGE) model, which is Step 2 of the modelling process. The 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 reform of the CSG scheme (Step 3).

Figure 4: Modelling Framework



2.4.1 The Micro Model and Linking Variables to CGE Model (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 (SALDRU, 2008).

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. Knowing whether labour force participation or employment are affected by receipt of the CSG is not obvious because of the endogeneity of the CSG variable. In South Africa, as in most 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 the CSG coefficient risks being biased, if some modelling precautions are not taken into account. In order to check for and to take into account the endogeneity problems, Bertrand et al. (2003) and Eyal and Woolard (2011) are followed, with major modifications.

An instrumental variable probit model (with standard errors corrected for the correlation of geographic clusters) is used, 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 (2010:472–477) and are computed with the ivprobit Stata command.

All kinds of workers (for wage, self-employed and casual) and short-term unemployed are taken as participating in 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. Although the CSG is more likely to affect mothers in the younger tail of the population, the entire working-age population was used, as defined by Statistics South Africa (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) of labour force participation following the extension of the CSG.

In order to check for the robustness of coefficients, the model was re-run only on individuals aged 22–50 years old and not enrolled in school at the time of the survey. Finally, the sample was restricted only to people whose youngest child living with them 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.

Consumption

The Exact Affine Stone Index (EASI) system is used to evaluate the effect of a change in the grant on household consumption behaviour and on the aggregate demand for different goods (Pendakur, 2008; Lewbel and Pendakur, 2009). The EASI system has the advantages but none of the limitations of the Almost Ideal Demand System (AIDS). Like the EASI, the AIDS has budget shares that 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, which account for unobserved preference heterogeneity. In this study, the EASI demand system is 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:

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

where u is the implicit utility[23], p is the J-vector of prices $p=[p_1, p_J]$, and z demographic characteristics.[24] By Shepard's Lemma, the Hicksian budget-share functions are:

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

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:

$$m^j(y,z) = \sum b_r^j y^r + \sum g_t^j z_t \quad [4]$$

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 with each consumption category, the primary price data collected by StatsSA at the provincial and regional levels is used. 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.

Having estimated the consumption coefficients, the changes in consumption patterns are stimulated (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 two million children benefiting from the CSG are estimated as described in Appendix 1.

2.4.2 The CGE Model and Linking Variables to Micro Module (Top–Down)

The SAM used is based on the 2005 Supply and Use Tables obtained from StatsSA and other national datasets from various sources such as the Reserve Bank of South Africa. The original SAM[25] had 85 activities and commodities. For the purpose of this study, the SAM is aggregated 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, and other products.[26]

[23] This utility is implicitly defined in terms of observables, namely expenditures x, prices p1, … , pJ and budget-shares in w1, … wj.
[24] The first element of z is 1.
[25] Davies, R and Thurlow, J. 2011. A 2005 Social Accounting Matrix for South Africa. Washington, DC, USA: International Food Policy Research Institute.
[26] Note that this last category contains all the durable goods that are not taken into account in the micro-model.

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

For the trade parameters, we use Gibson (2003) for the low-bound export supply. Estimates of industrial production parameters 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, unemployment is introduced. Levels of unemployment are very high, but unions are very strong and, as a result, wages and salaries are relatively 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.

To introduce the changes in household consumption shares, we assume that household 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 to be 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 in the world market, they need to reduce their free on board (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, and intermediate consumption prices and revenues 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 estimate the changes of employment status and its associated revenue, as well as revenues from agriculture and non-agriculture sectors in comparison with the base year, and then obtain the total per capita change of household revenues associated with the two simulation scenarios. Due to the hypothesis that there are no savings, changes in revenues are 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. First four possible statuses are identified for people aged between 15 and 64 years who were not enrolled in school at the time of the survey: wage worker, unemployed, self-employed, and not participating in the labour market (i.e. not working or discouraged). After the model is estimated, we predict 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 fed 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 the employment status of unemployed people, or people not participating in the labour market (wage workers) who 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 are not participating in the labour market and who show the highest probability of being unemployed are moved to the pool of unemployed. If a decrease in the unemployment rate is simulated, the people who are initially unemployed and show the lowest probability of being unemployed are moved out of unemployment. Here it is assumed that the self-employed are not affected by changes in the employment status.

Changes in employment status are reflected in changes in wage income. People who lose their jobs experience a reduction in wage incomes equal to their observed wage; while those finding a 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 assumed that unemployed people do not benefit from South African unemployment subsidies if they become unemployed.

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:

$$\Delta\pi_h = \sum_{k=1}^{K} Y_k \Delta p_{Y,k} - I_k \Delta p_{I,k} \quad [6]$$

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* (before 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 rather than producer prices.

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

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

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

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

$$\Delta Y_h = \Delta\pi_h + \Delta\varphi_h \quad [8]$$

Back to contents

Finally, the approach used to evaluate the effect on household 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 Appendix 2):

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

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 defined as:

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

where z is the national monthly poverty line at the base year, equal to R502 (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 to the different scenarios: 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.

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

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

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-$L(p)$.

2.5 Results

Results of the labour force participation model are shown in Table 7. The three specifications of the model presented differ 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. A positive link is always found 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 7: 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, i.e. people aged 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 8 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 per cent change in their price (more than proportionate reduction), while the own price elasticity of 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 per cent 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, of 1.17 and 1.11 respectively.

Table 8: 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 per cent.

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 9 summarises the results of the shocks:

Table 9: 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, three shocks are applied to the CGE model at the same time. Each 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 in the transfer households receive from government will increase their income as well as the government deficit. Finally, the changes in household consumption shares will have impacts on final demand.

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

Table 10: 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 household 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 75–95 per cent of the composition of total demand for commodities. Thus this change in household consumption will have a huge impact on their production. In contrast, the non-alimentary commodities rely more on intermediate demand from other sectors.

As Table 11 shows, production increases, notably in the education sector, which (together with the dairy sector) is labour-intensive. Thus, to increase their production, both sectors will hire more workers. To produce more, firms can hire workers either 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 of 0.04 per cent and 0.05 per cent respectively in the first and second scenarios. In the third scenario, where the two policies are combined, labour increases by 0.08 per cent.

Table 11: 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.

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

Government income increases because of increased direct tax receipts, indirect taxes (as consumption increases), and production taxes. However, given the increase in its transfers (i.e. the increase of the CSG), government savings decrease.[27] This has an impact on total investment, which decreases and has an impact on non-alimentary and other food commodities, as they are the only ones consumed for investment purposes. The impact on price is hardly perceptible as seen in Table 12: the consumer price index increases very slightly by 0.022 per cent, 0.014 per cent, and 0.03 per cent respectively in the three scenarios.

Table 12: 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.

[27] 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

Before looking at the poverty and inequality results, it is worth discussing briefly the budget cost of the different simulations. Simulation 1 would cost the government 1.11 per cent of GDP (in 2008 terms), while simulation 2 and simulation 3 would cost 1.15 per cent and 1.38 per cent respectively. All the scenarios would call for a significant budget increase (probably unrealistic in the case of sim3), as in 2008 the CSG programme cost 0.93 per cent of GDP.

Tables 13 to 19 report the results for poverty gaps and the inequality Gini index by different groups. Table 13 and Table 14 show that P0, P1 and P2 decrease in comparison with the base year for the whole population as well as for children. The improvement is particularly strong in respect of 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 of the change in the CSG – have practically no further effects on household 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 per cent 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). The 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: P0 by 1.3, and P1, P2 and Gini by 2.4, 2.3 and 1.1 percentage points respectively. If the multiplier effects are not taken into account, poverty incidence, poverty gap, poverty severity, and the Gini index do not change.

Poverty and inequality effects depend primarily 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 two million will be reflected in the results for sim2. As for sim1, Limpopo and the Eastern Cape show the largest poverty reduction, which is expected as they are the provinces with the largest shares of CSG beneficiaries in the base year (see Table 19 in Annexure 4). This will also be the case for households living in tribal authority areas, and for the African population group. Concerning sim2, Northern Cape is the province where the largest increase in the number of additional beneficiaries (in per cent and in percentage points) is simulated, as well as for the African population group (see 2.18 in Annexure 4). 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 the 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 15) 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 inequality deteriorates – although slightly – when multiplier effects are included.

As expected, African and Coloured households benefit the most from the CSG proposed reforms, while White households are not affected (see Table 16 in Appendix 4). Interestingly, Indian households largely benefit from a 20 per cent increase in the value of the CSG, with a reduction in the

number of people living below the poverty line – a large part of households receiving the CSG are around the poverty line (see Figure 5 in Appendix 4). Under both simulation scenarios, welfare improves for households in rural formal, tribal authority and urban informal areas; poverty is not affected for households living in formal urban areas under sim1 but is reduced under sim2 (see Table 17 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 having a substantial impact on child poverty and welfare in general (see Table 18 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 a one percentage point reduction in poverty gap (P1) among 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 13: 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 14: 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 15: 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).

2.6 Conclusion

This chapter examined the impact of the CSG on the South African economy using a bottom–up/top–down modelling approach to estimate the potential effects of a change in the CSG on the welfare of South African households as well as the national economy. Three simulation scenarios are presented: in simulation 1 the value of the CSG is increased by 20 per cent, in simulation 2 the number of beneficiaries among the eligible children is increased by two million, while simulation 3 combines the first and second simulations. A positive link is found between the CSG and the probability of participating in the labour force. Results are encouraging at the economy-wide level, showing that the CSG has several positive impacts on the economy. The consumption and production of education and nutritious food products increase. Household income increases, as a result of the positive impact on the labour market, together with the increase in the transfers received. Poverty decreases in comparison with the base year for the whole population and for children. Finally, the results show that simulation 1 is the most cost-effective of the policies.

The great danger confronting South Africa today is that longer-term fiscal imperatives could be used as reasons to limit necessary growth in spending on the CSG. At the economy-wide level, the results of this study challenge the often-held view that these grants are squandered on non-productive consumption. The study shows in no uncertain terms that even these modest reforms have a significant impact on children and households, by improving the welfare of the poorest and allowing poor households to increase their consumption of education and nutritious foods. The CSG is a consumption expenditure that enhances intergenerational equity, and also promotes productive efficiency and human capital. This suggests a compelling "developmental state"

argument to preserve and protect current expenditure levels even in fiscally austere conditions. We therefore recommend that Government expands coverage and strengthens integrated social protection systems to respond to the multiple and compounding vulnerabilities faced by children and their families. However, levels of child poverty are so high that much more needs to be done.

2.7 Recommendations

With respect to the **social protection sector in terms of social and economic value**, the Commission recommends that:

- Government makes more resources available through the transfer system to enable progressive realisation of an ideal child support system. An ideal child-support system is a system that relaxes the existing means test and moves towards faster universalisation of the Child Support Grant (CSG). This should happen even under fiscal consolidation because of the social and economic benefits.
- Government puts in place a system to ensure coverage is extended to children currently excluded from accessing the CSG for administrative reasons.
- Government moves faster towards consolidating the various social protection instruments (CSG, Foster Child Grant, UIF, social wage, etc.), as part of the long-standing reform of the social security system because of the significant effects on reducing child poverty.
- National Treasury provides advice to departments and agencies working with children on developing major cross-portfolio initiatives aimed at eliminating child poverty. To date, a range of child poverty measures have been accommodated and scattered across many agencies, but these should be nested within a new unified outcomes framework of related agencies because of synergies with related programmes.

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Appendix 1: Selection of the New Two 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 a child has reached the age of 14 years old, they are very unlikely to become a new beneficiary.

Appendix 2: Calculation of the Equivalent Income

The equivalent income is the level of income, at the reference price p_r, ensuring the same utility level as that obtained with the income level $X_{c,h}$ and the price system P_c:

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

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:

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

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 $e_{c,h}=e(p_r,p_c,x_{c,h})$ 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:

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

where u is the implicit utility[28] , *p* is the J-vector of prices p=[p_1 , p_j], and z demographic characteristics[29]. By Shepard's Lemma, the Hicksian budget-share functions are:

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

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

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

where ln*x* - ∑ w_j lnp^j is the log of stone-index deflated nominal expenditures. From [17], we have:

$$m^j\left(u,z\right) = w^j\left(p,u,z\right) - \sum a_{jk}\ln p^k \quad [19]$$

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

[29] The first element of z is 1.

By substituting [19] in [16], we have:

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

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

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

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

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

from where U_o:

$$e_{c,h}=\exp\left(\ln x_{c,h}-\sum_{j=1}^{J}w^{j}\left(\ln p_{c}^{j}-\ln p_{r}^{j}\right)+\frac{1}{2}\sum_{j=1}^{J}\sum_{k=1}^{K}a_{j,k}\left(\ln p_{c}^{j}\ln p_{c}^{k}-\ln p_{r}^{j}\ln p_{r}^{k}\right)\right) \quad [23]$$

Appendix 3: Calculation of Elasticities

Calculation of price elasticities in the EASI system

Consider the EASI implicit marshallian demand system:

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

where:

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

and

$$w^j = \frac{p_j q_j}{x} \quad [26]$$

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

So, we have:

$$\frac{\partial Q_j}{\partial p_i} = \frac{\partial \frac{x w_j}{p_j}}{\partial p_i} + \frac{x}{p_j} \frac{\partial w_j}{\partial p_j} \quad [27]$$

Moreover:

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

This allows to write:

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

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

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

Calculation of income elasticities in the EASI system

If we consider [24], [25] and [26] we have:

$$\frac{\partial Q_j}{\partial x} = \frac{1}{p_j} w_j + \frac{x}{p_j} \frac{\partial w_j}{\partial x} \qquad [31]$$

Moreover:

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

It follows that:

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

Hence, the elasticity of good j with respect to income e^x_j is:

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

Appendix 4: Additional Tables

Table 16: 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 17: 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 18: 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.

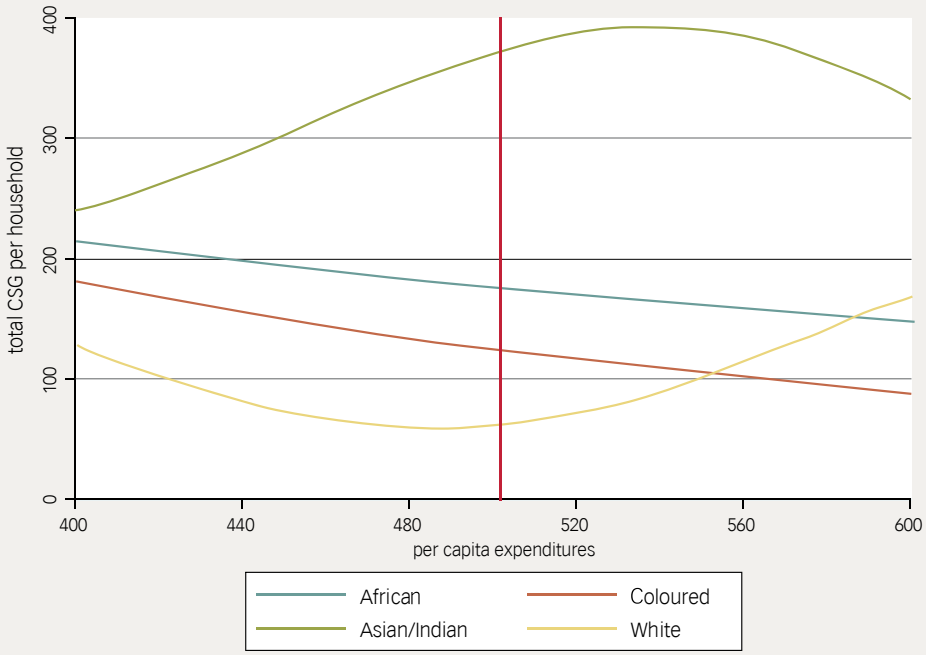
Note: figures in bold indicates the cases where the difference with the reference situation is statistically different from zero. As for figures not including the multiplier effect, the difference is calculated with respect to the corresponding scenario including the multiplier effect. Statistical tests,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

Table 19: 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 5: 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).