Final Report Executive Summary

The Social and Economic Impact of South Africa's Social Security System

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Social grants in South Africa play a critical role in reducing poverty and promoting social development. This study evaluates the social and economic impact of State Old Age Pensions (SOAP), Disability Grants (DG), Child Support Grants (CSG), Care Dependency Grants (CDG), Foster Care Grants (FCG) and Grants-in-Aid (GIA). The analysis evaluates the role of social assistance in reducing poverty and promoting household development, examining effects on health, education, housing and vital services. In addition, the study assesses the impact of social grants on labour market participation and labour productivity, providing an analysis of both the supply and demand sides of the labour market. The study also quantifies the macro-economic impact of social assistance grants, evaluating their impact on savings, consumption and the composition of aggregate demand. Most of the statistical analysis focuses on the CSG, SOAP and DG since sample sizes are sufficiently large for these grants to support significant inferences.

South Africa's system of social security successfully reduces poverty, regardless of which methodology is used to quantify the impact measure or identify the poverty line. Nevertheless, the quantitative measure of poverty reduction is sensitive to the methodological choices. For instance, the measured impact is consistently greatest when employing the total rand poverty gap as an indicator. The poverty headcount measure, however, consistently yields the smallest results. Likewise, the choice of poverty line heavily influences the measurement of the quantitative impact. The currently social security system is most successful when measured against destitution, and the impact is smallest when poverty lines ignore economies of scale and adult equivalence issues. For instance, South Africa's social grants reduce the poverty headcount measure by 4.3%, as measured against the Committee of Inquiry's expenditure poverty line (with no scales). The social security system, however, reduces 45% of the total rand destitution gap—an impact more than ten times greater.

Using the Committee of Inquiry expenditure poverty line (without scales), a 10% increase in take-up of the SOAP reduces the poverty gap by only 1.2%, and full take-up by only 2.5%. The take-up rate for the SOAP is already very high, and many of the eligible elderly not already receiving the SOAP are not among the poorest South Africans. As a result, further extensions of the SOAP have limited potential in reducing poverty. Extensions of the Disability Grant offer greater promise, although at substantially greater expense. A 50% increase in DG take-up reduces the total rand poverty gap by 1.7%, and full take-up generates a 5.1% reduction. The greatest poverty reducing potential lies with the

progressive extension of the Child Support Grant. Extending the eligibility age to 14 reduces the poverty gap by 16.6%, and a further extension to age 18 reduces the gap by 21.4%. Increasing the real grant payment (as the government did in 2003) generates an even greater impact. The extension to age 14 yields a 22% poverty gap reduction, while the extension to age 18 reduces the poverty gap by 28.3%. Combining the higher CSG extended to age 14 with the full take-up of the SOAP and the DG yields a reduction in the total rand poverty gap of 29%.

The magnitudes of these effects, of course, depend critically on the poverty line by which the impacts of the reforms are measured. For instance, the 29% reduction in the total rand poverty gap measured using the unscaled Committee of Inquiry expenditure poverty line is less than half the magnitude of the reduction in destitution, which amounts to a 66.6% reduction. Likewise, the impacts of the scaled Committee of Inquiry income and expenditure poverty lines are substantially greater than for the unscaled poverty lines. The impact of the "all grants" package measured with the scaled Committee of Inquiry income poverty line reflects a 47.4% reduction, and with the expenditure poverty line, a comparable 47.5% reduction. As this makes apparent, the distinction between income and expenditure poverty has not generated material differences in this analysis. Likewise, the impact using the unscaled Committee of Inquiry income poverty line (a 28.9% reduction) is virtually the same as that using the unscaled Committee of Inquiry expenditure poverty line (a 29.0% reduction). For almost every simulation, the HSL poverty line generates very close results to those yielded by the scaled Committee of Inquiry income and expenditure poverty lines, in spite of the substantial methodological differences distinguishing the HSL measure. The relative poverty line yields results that are not closely comparable to any of the other poverty line measures, with the results generally falling in between the results of the Committee of Inquiry scaled and unscaled poverty line measures.

The evidence in this report documents the substantial impact of South Africa's social security system in reducing poverty and destitution. The magnitudes of the results are sensitive to methodological issues. It matters whether the poverty line is relative or absolute, whether it is scaled for household composition and economies of scale or not, and to a small extent whether it measures income or expenditure. Likewise, it matters how the poverty impact is measured—using poverty headcount or variants on the poverty gap. Nevertheless, the qualitative results, and the answers to critical policy questions, are robust to different methodological approaches. South Africa's system of social security substantially reduces deprivation, and the progressive extension of the magnitude, scope and reach of social grants holds the potential to dramatically diminish the prevalence of poverty in South Africa.

The results of this study provide evidence that the household impacts of South Africa's social grants are developmental in nature. These findings are consistent with international lessons of experience, as well as with previous studies of South Africa's system of social security. Social security programmes in Brazil, Argentina, Namibia and Botswana yield positive impacts in terms of reducing poverty, promoting job search and increasing school attendance. Past studies of social security in South Africa have focused on the State Old Age Pension, identifying important positive effects in terms of broadly reducing household poverty as well as improving health and nutrition.

Poverty and its associated consequences erode the opportunities for children and youth to attend school, fomenting a vicious cycle of destitution by undermining the household's capacity to accumulate the human capital necessary to break the poverty trap. The statistical evidence from this research documents the extent to which poverty exerts a negative impact on school enrolment rates. Many poor children cannot attend school due to the costs associated with education, including the necessity to work to supplement family income. In

addition, communities that are resource-constrained provide lower quality educational services, which negatively affects enrolment rates. Social security grants counter these negative effects by providing households with more resources to finance education. New findings from this study demonstrate that children in households that receive social grants are more likely to attend school, even when controlling for the effect of income. The positive effects of social security on education are greater for girls than for boys, helping to remedy gender disparities. But both the State Old Age Pension and the Child Support Grant are statistically significantly associated with improvements in school attendance, and the magnitudes of these impacts are substantial. This analysis only measures the direct and static link between social security and education. To the extent that social grants promote school attendance, they contribute to a virtuous cycle with long term dynamic benefits that are not easily measured by statistical analysis.

Nationally, nearly one in five households experienced hunger during the year studied (2000). The highest income provinces—Gauteng and the Western Cape—have the lowest prevalence rates of hunger. The prevalence rate of hunger is highest in one of South Africa's poorest provinces—nearly one in three households in the Eastern Cape experiences hunger. However, another of the poorest provinces—Limpopo—has the third lowest hunger prevalence rate in the country. Meanwhile, Mpumalanga—with a poverty rate below the national average—has the second highest hunger prevalence rate in the country. Social grants are effective in addressing this problem of hunger, as well as basic needs in general. Spending in households that receive social grants focuses more on basics like food, fuel, housing and household operations, and less is spent on tobacco and debt. All major social grants—the State Old Age Pension, the Child Support Grant and the Disability Grant—are significantly and positively associated with a greater share of household expenditure on food. This increased spending on food is associated with better nutritional outcomes. Households that receive social grants have lower prevalence rates of hunger for young children as well as older children and adults, even compared to those households with comparable income levels.

Receipt of social grants is associated with lower spending on health care, perhaps because social grants are associated with other positive outcomes that reduce the need for medical care. For instance, the World Bank identifies the important link between improved education and stemming the spread of HIV/AIDS. Likewise, social grants are associated with greater household access to piped water. The evidence in this chapter underscores the importance of moving beyond measures of income poverty in the assessment of social deprivation. In case after case in this study, household outcomes conflicted with the simple implications of monetary income rankings. While many measures of well-being are correlated with aggregate income and expenditure, the exceptions affect large numbers of people and require careful policy analysis. The interaction between social security and household well-being is complex, and further research continues to explore these interactions. In particular, the broad measures of household well-being analysed in this chapter exert profound effects on labour productivity and the ability of workers to find jobs. Employment in turn provides access to resources that promote improved education, nutrition, health and other outcomes.

Conventional economic theory suggests that social grants may undermine labour force participation by reducing the opportunity cost of not working. Models developed for industrialised countries and applied broadly to South African data sometimes corroborate this hypothesis. However, when models are developed that reflect the labour market behaviour of South Africans who receive social grants, the results contradict this hypothesis. The response of very low income South Africans to a marginal increase in their income is significantly different from the response of median income South Africans.

To the extent that social grants create adverse labour market effects, the adverse consequences stem from distortions in social security targeting mechanisms. For instance, to the extent that the State Old Age Pensions are employed to target the non-pensioner poor, then the grants may encourage a household formation response that impedes job search. These types of problems can be addressed by broadening the base of the social security programmes. The more comprehensive the system of social security, the fewer distortions are generated by the incentive effects created by the social grants.

This study explicitly examines the impact of social grants on the labour market participation, employment success and realised wages of South Africans in households receiving social grants. While statistical analysis cannot prove causation, the empirical results are consistent with the hypotheses that:

(1) Social grants provide potential labour market participants with the resources and economic security necessary to invest in high-risk/high-reward job search.

(2) Living in a household receiving social grants is correlated with a higher success rate in finding employment.

(3) Workers in households receiving social grants are better able to improve their productivity and as a result earn higher wage increases.

The empirical evidence discussed in this chapter demonstrates that people in households receiving social grants have increased both their labour force participation and employment rates faster than those who live in households that do not receive social grants. In addition, workers in households receiving social grants have realised more rapid wage increases. These findings are consistent with the hypothesis that South Africa's social grants increase both the supply and demand for labour. This evidence does not support the hypothesis that South Africa's system of social grants negatively affects employment creation.

At the macro-economic level, South Africa's system of social development grants tends to increase domestic employment while promoting a more equal distribution of income. The effects of grants on national savings and the trade balance are ambiguous, since grants have two competing effects on the national savings—one through private domestic savings, and the other through the trade deficit. Depending on the magnitude of the effects, grants could improve or worsen national savings and the trade balance. Initial analysis suggests that the impact on savings may be negative, while that on the trade balance may be positive. However, since much of the savings of upper income groups are offshore, the negative impact is unlikely to be significant, particularly given the small share of private savings in the national savings rate. The impact on inflation may also be ambiguous. The increase in overall demand in the economy may generate some inflationary pressure. However, the relatively low rate of capacity utilisation may enable the economy to meet this demand without significant increases in inflation. Likewise, the positive trade balance effects may lead to an appreciation of the rand, tending to dampen imported inflation. On balance, the macro-economic impact of South Africa's social security system is largely positive. These positive macroeconomic effects support higher rates of economic growth, which are re-inforced by the social security system's positive effects on income distribution and education.

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CHAPTER 1)
Introduction

South Africa's social grants play a vital role in reducing poverty and promoting social development. Numerous academic studies document the broad social and economic impact of these effective social security programmes. This report provides an appraisal of the impact of State Old Age Pensions (SOAP), Disability Grants (DG), Child Support Grants (CSG), Care Dependency Grants (CDG), Foster Care Grants (FCG) and Grants-in-Aid (GIA). The analysis evaluates the role of social assistance in reducing poverty and promoting household development, examining effects on health, education, housing and vital services. In addition, the study assesses the impact of social grants on labour market participation and labour productivity, providing an analysis of both the supply and demand sides of the labour market. The study also quantifies the macro-economic impact of social assistance grants, evaluating their impact on savings, consumption and the composition of aggregate demand.

This paper is divided into four major chapters. The first major chapter (chapter 2) employs EPRI's micro-simulation model calibrated with administrative data for January 2003. The model, using Statistic South Africa's *Labour Force Survey* and 2000 *Income and Expenditure Survey*, provides measures of social assistance take-up by household income level. In addition, the surveys provide detailed profiles on the household's living standards, labour market activity and consumption patterns. This chapter assesses the impact of the current system of social grants on poverty reduction. In addition, alternative scenarios of social security reform are evaluated and compared, with a particular focus on extensions of the Child Support Grant. The study analyses the impact of methodological issues on poverty analysis.

The second major chapter (chapter 3) uses this model to evaluate how receipt of social assistance grants affects household access to health care, schooling, housing, electricity, water and social infrastructure. The chapter analyses survey data provided by Statistics South Africa, building models of household expenditure and testing how receipt of social grants affects spending patterns. In addition, the study investigates direct outcomes variables, such as school attendance, and how these are affected by the receipt of social grants by households.

The third major chapter (chapter 4) extends this household analysis to the labour market, examining the impact of social grants on employment and productivity The chapter analyses Statistics South Africa's *Labour Force Survey*, evaluating the impact of social grants on labour force participation and employment success. The study also evaluates the impact of social grants on realised wages, as a measure of the impact of social grants on labour force productivity. The analysis includes both cross-section and panel data econometric models, as well as descriptive statistics.

The fourth major chapter (chapter 5) analyses the macro-economic impact, aggregating the micro-simulation variables to calculate effects on national savings and

consumption by economic sector. In addition, this chapter evaluates macro-economic data provided by Statistics South Africa, the Reserve Bank of South Africa and the National Treasury. This chapter builds on the household impact analysis from chapter 3, extending these findings to the macro-economic level.

The final chapter (chapter 6) summarises the key findings of the study and briefly discusses the conclusions and policy implications.

CHAPTER 2)
The Impact of Social Assistance on Poverty Reduction

2.1) INTRODUCTION

This chapter assesses the impact of South Africa's social security system on poverty reduction. Given data availability on three major social grants programmes--the State Old Aged Pension (SOAP), the Child Support Grant (CSG) and the Disability Grant (DG), the analysis focuses on how these three programmes play a major role in supporting the incomes of poor households. This study employs EPRI's micro-simulation model to assess the impact of existing social security programmes as well as the potential impact of social security policy options as identified by the Department of Social Development with respect to extensions and increased take-up of the existing major social grants.

The study assesses the extent of poverty in South Africa using three different measures:
(1) The poverty headcount measure, which quantifies the number of people in South Africa below a given income or expenditure threshold;
(2) The relative poverty gap measure, which quantifies the average magnitude of the gap between the incomes of the poor and the income required to keep people out of poverty;
(3) The rand poverty gap measure, which quantifies the total rand value of the magnitude of the gap between the incomes of the poor and the income required to keep people out of poverty.

These three measures all depend on the calculated poverty line that reflects the minimum income or expenditure necessary to keep a household out of poverty. The analysis in this chapter reflects different calculations of the poverty line, determined using assumptions and methodologies developed in co-ordination with the Department of Social Development. The use of multiple poverty lines provides an analysis of the sensitivity of the final results to different assumptions and methodologies.

Income poverty can be measured in two different ways:
- In absolute terms: *absolute poverty*, and
- In relative terms: *relative poverty.*

In this study, poverty and the impact of social security are evaluated on a household basis. The interaction between household structure and the poverty line are incorporated through the calculation of a household poverty line on an individual basis, reflecting differential expenditure for adults and children as well as economies of scale in supporting households. Several different formulas, developed in consultation with the Department of Social Development, are evaluated in order to provide a thorough sensitivity analysis. Alternative grant extension and take-up scenarios, as developed in consultation with the Department of Social Development, are analysed below.

2.2) METHODOLOGY

One of the primary objectives of the study is to measure the impact of the social security system on poverty reduction. In order to ascertain the impact of poverty interventions, however, one must first determine an appropriate definition for poverty, and identify who is considered impoverished. A useful analytical tool to inform policy in this regard is the poverty datum line, or poverty line. A poverty line is generally defined as a minimum level of income or expenditure below which an individual or household is designated as "poor."

There are several problems associated with a poverty line:
• Defining such an income involves an element of arbitrariness and a small change in the stipulated poverty line can have great impact on the extent of measured poverty.
• A poverty line gives an indication of how many people are regarded as poor (headcount index). However, the line in itself does not yet indicate *how* poor those people are. The real value of poverty lines stems from measuring *changes* in poverty levels over time or resulting from alternative policies, as opposed to measuring the *absolute* extent of poverty at a particular time.

Another set of issues pertains to the construction of minimum standards of living for households possessing different demographic characteristics. Research documents that consumption may depend on age and gender, and women and children generally consume less than men consume. Larger households certainly need more income than smaller households need, but on a *per capita* basis they may actually need less, due to the effect economies of scale.

There is no widespread consensus on these issues, and the purpose of this study is not to establish a single favoured method. Rather, the study seeks to highlight some of the important methodological issues associated with selecting a poverty line, and some of the benefits and drawbacks of different methodologies. Instead of selecting a particular method, EPRI will conduct the poverty analysis using several different poverty lines, with and without the inclusion of the equivalence scales.

METHODOLOGICAL ISSUES: RELATIVE VS. ABSOLUTE POVERTY LINES

An absolute poverty line aims to define a minimum standard, often based on a cost of needs assessment, such as the cost of a basket of food items that provide a basic level of nutrition. An absolute poverty line is a fixed measure, an income or expenditure threshold below which a household is considered poor; the threshold does not change with a rising standard of living in a country. Thus, economic growth distributed uniformly across society will result in a decreasing poverty rate, as households that were previously considered impoverished move across the poverty line. This fixed quality of absolute poverty lines is particularly useful for informing policy, as it

provides a fixed target for poverty interventions. Policy-makers can assess the impact of current or proposed social assistance programmes by using an absolute poverty datum line to measure changes in the poverty rate. Furthermore, an absolute poverty line may be a more accurate measure of commodity deprivation than a relative measure, as it is often directly linked to consumption of specific basic items. Whether a household or individual consumes enough of basic needs (food) may arguably be a more accurate and intuitive measure of impoverishment than where the individual falls on the income distribution.

Several methods are used to determine the absolute poverty line:

• Food energy method: this method estimates the food energy minimum required to satisfy dietary energy requirements, and then determines the level of income or consumption at which this minimum is typically met, using survey data to regress calorie intake against consumption expenditures or incomes.[1]

• Orshansky method (a variation of the food energy method): this method finds the cost of a bundle of goods that achieves the stipulated minimum energy intake level and divides this amount by the share of total expenditure allocated to food of a group of households deemed likely to be poor[2]. Thus, for instance, if the bottom 40% of households allocate half their total expenditure on food, then the food poverty line is divided by 0.5 in order to arrive at an overall absolute poverty line.

• Cost of basic needs method: this method calculates the level just sufficient to buy a low cost adequate diet and other cheap basic requirements such as clothes, fuel, transportation, etc.

Two widely used data sources for constructing absolute poverty lines for South Africa are the Household Subsistence Level (HSL) report, produced by the Health and Development Research Institute at the University of Port Elizabeth, and the Minimum Living Level, produced by the Bureau of Market Research. For this study, EPRI uses a cost of basic needs method to construct an absolute poverty line, employing cost data from the *Household Subsistence Level Survey*.

DERIVING AN ABSOLUTE POVERTY LINE: THE HOUSEHOLD SUBSISTENCE LEVEL SURVEY

The Household Subsistence Level Survey (HSL) is an ongoing biannual market survey of the cost of food, clothing, fuel, transport, rent, and other necessary household items in 24 major urban centres of South Africa. The survey quantifies the cost of a bundle of consumption goods deemed necessary to maintain a minimum standard of living.   Despite   considerable   controversy   over   what   constitutes   an   acceptable

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[1] Greer and Thorbecke in Mlambo 2001:4.
[2] Mlambo 2001:4

"minimum" living level, the HSL is one of the frequently cited surveys used by social science researchers to quantify the prevalence of consumption poverty in South Africa. As the HSL is one of the few surveys that provides a detailed account of the cost of a minimum standard of living, the data is frequently used to determine an absolute poverty line for South Africa.

For low-income groups, particularly in developing countries, food expenditure constitutes a large portion of total household expenditure. The HSL survey thus begins with a detailed account of the cost required to achieve a basic nutritionally adequate diet. The survey determines the prices of specified amounts of selected food items, for example a monthly ration of 795 grams of red meat, which constitute a minimum monthly intake of proteins, carbohydrates, and essential nutrients. The monthly food ration approach used by the HSL is derived from the nutritional requirements outlined by the Department of National Health and Population Development in 1993. These nutritional requirements were originally conceived by the National Research Council in the USA, and adapted by the Department of National Health to account for South African dietary norms. Table 2.1 below lists the specified quantities of selected food items that are deemed necessary to meet the nutrient requirements for different age-gender groups. Recognising that basic needs requirements vary according to age and gender, the food intake requirements are specifically tailored for 9 different groups (children 1-3 years, children 4-6 years, children 7-10, girls/women 11-14, 15-18, 19+, boys/men 11-14, 15-18, 19+).

Table 2.1: Minimum Monthly Ration Scale for Low Income Groups

FOOD ITEM Quantities= grams or ml	Male 19+	Female 19+	Child 1-3	Child 4-6	Child 7-10	Female 11-14	Female 15-18	Male 11-14	Male 15-18
Skimmed milk powder	1200	1200	1200	1200	1200	1200	1200	1200	1200
Meat (red & chicken)	795	795	245	389	577	795	795	795	795
Fish	397	397	123	195	289	397	397	397	397
Eggs (1 egg= 50g)	650	650	650	650	650	650	650	650	650
Fresh vegetables	9000	9000	3600	5550	7650	9000	9000	9000	9000
Fresh Fruit	1083	1083	823	823	1083	1083	1083	1083	1083
Margarine	600	450	300	450	450	450	450	600	600
Cooking Oil (ml)	606	606	260	433	606	606	606	606	606
Brown Bread (800g)	8400	4200	1650	2100	3150	4200	4200	5250	8400
Maize Meal, Samp (12.5:2.5 kg)	7200	5400	3600	5400	5400	5400	5400	5400	7200
Sugar and Jam (2500:900g)	2100	1200	900	1050	1200	1200	1200	1350	2100
Peanut Butter	433	433	260	260	260	433	433	433	433
Legumes (Beans & Peas)	390	390	65	130	139	390	390	390	390
Coffee and Tea	217	217	~	~	139	217	217	217	217
Salt	130	130	65	65	139	130	130	130	130
Spices and Condiments (e.g. pepper, curry, etc)	44	44	22	22	44	44	44	44	44
Fluids (e.g. Vinegar)	87	87	44	44	87	87	87	87	87

Source: **Potgieter (2000).**

Since food prices vary from region to region, the per capita monthly expenditure required for purchasing the minimum monthly food ration also varies, from a low of R160.13 for an adult male residing in Pietermaritzburg to R173.55 for an adult male living in Pretoria. Table 2.2 lists the monthly per capita cost of purchasing the minimum monthly food ration for the specified age and gender groups in 15 South African cities.

Table 2.2: Monthly Cost of Food, August 2000

CITY	Child 1-3	Child 4-6	Child 7-10	Male 11-14	Male 15-18	Male 19+	Female 11-14	Female 15-18	Female 19+
Cape Town	79.25	95.55	118.17	140.70	160.57	160.57	135.56	135.56	135.56
Port Elizabeth	79.79	96.70	120.70	144.06	164.43	164.43	138.64	138.64	138.64
East London	81.20	98.32	122.06	145.65	166.12	166.12	140.21	140.21	140.21
Kimberley	78.96	94.85	118.66	142.57	163.38	163.38	137.05	137.05	137.05
Durban	85.73	102.06	125.12	147.64	166.90	166.90	142.55	142.55	142.55
Pretoria	83.65	101.60	126.87	152.06	173.55	173.55	146.42	146.42	146.42
Johannesburg	87.43	104.34	127.71	151.57	172.43	172.43	145.85	145.85	145.85
Bloemfontein	81.11	98.88	124.28	149.05	169.85	169.85	143.50	143.50	143.50
King Williams	81.58	98.49	122.53	146.01	166.55	166.55	140.56	140.56	140.56
Uitenhage	81.21	97.61	121.20	144.33	164.96	164.96	138.89	138.89	138.89
George	80.39	96.85	120.71	144.19	164.29	164.29	138.75	138.75	138.75
Pietermaritzburg	78.61	94.51	117.21	139.62	160.13	160.13	134.20	134.20	134.20
Potchefstroom	81.45	98.32	122.42	146.61	168.26	168.26	140.85	140.85	140.85
Pietersburg	80.64	96.99	120.79	145.24	166.62	166.62	139.50	139.50	139.50
Umtata	84.76	100.92	124.26	147.54	167.67	167.67	142.18	142.18	142.18
Averages	81.72	98.40	122.18	145.79	166.38	166.38	140.31	140.31	140.31

Source: **Potgieter (2000).**

As seen in Table 2.2, different dietary requirements specified for age and gender groups results in varying per capita monthly food expenditure required to maintain basic nutrition. Children aged 1-3 cost, on average, around 49% of monthly food expenditure for adult males, while the food expenditure for males aged 11-14 is almost 90% of the adult male. Males aged 15-18 require the same dietary requirements and thus the same monthly expenditure as their adult counterparts. Food expenditure for girls and women over age 11 is 84% of the monthly food expenditure of the adult male.

In addition to food costs, the survey also documents the cost of housing, transport, washing and cleansing materials such as soap and dishwashing detergent, lighting and fuel costs,[3] and the cost of clothing. The cost of lighting, fuel, washing and cleansing materials, rent, and transport are calculated at the household level, while clothing costs are calculated at the individual level according to age and gender requirements. Table 2.3 below displays the subsistence level expenditure on the items for which expenditure is calculated at the household level. For clothing, basic monthly expenditure for adult women is estimated at R47.28 per month on clothing, while the figure for adult males is R48.80; these figures are do not vary by location. Basic monthly clothing expenditure for children aged 3 and less is 25% of the adult female expenditure on clothing, while children aged 4-9 are estimated to spend 50% of adult

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[3] Includes paraffin and candles as well as electricity distributed by Eskom.

female expenditure, and the basic expenditure of children 10-16 years of age is estimated at 75%.

Table 2.3: Cost of Housing, Transport, Energy, Washing, Cleaning (Aug. 2000)

AREA	Housing	Transport	Fuel, Lighting, Washing, Cleansing
Cape Town	R 52.94	R 136.26	R 218.21
Port Elizabeth	R 70.48	R 114.20	R 210.38
East London	R 83.98	R 126.87	R 229.95
Kimberley	R 107.75	R 127.74	R 255.46
Durban	R 22.80	R 168.87	R 214.95
Pretoria	R 121.47	R 173.20	R 219.71
Johannesburg	R 131.98	R 173.20	R 188.50
Bloemfontein	R 79.89	R 144.84	R 214.47
King Williams Town	R 116.95	R 122.51	R 193.27
Uitenhage	R 65.07	R 80.98	R 236.17
George	R 79.28	R 129.90	R 230.58
Pietermaritzburg	R 35.05	R 112.58	R 245.45
Potchefstroom	R 68.54	R 116.91	R 206.81
Pietersburg	R 42.45	R 151.55	R 196.60
Umtata	R 152.58	R 86.60	R 158.06
Benoni	R 100.83	R 151.55	R 247.50
Boksburg	R 72.67	R 173.20	R 245.27
Brakpan	R 73.24	R 140.73	R 231.73
Germiston	R 115.76	R 162.38	R 239.75
Springs	R 77.30	R 129.90	R 223.82
Krugersdorp	R 112.30	R 129.90	R 238.15
Vaal Triangle	R 87.45	R 129.90	R 265.28

Source: **Potgieter (2000).**

These costs are then added together with the cost of food to create an aggregate measure of a minimum standard of living, the Household Subsistence Level (HSL). The household subsistence level (HSL) varies substantially over the different urban centres, from a low of R1274.11 per month for a family of five (two adults, three children) in Pietermaritzburg to a high of R1456.16 per month for a family of five residing in Germiston. One noticeable omission from the HSL is an allowance for educational expenditure. Arguably, this is an "essential" household expenditure, without which a household may reasonably be characterised as suffering from substantial deprivation. In South Africa, where school fees are a common feature of the public school system, the cost of education should be included in any account of a basic cost of living.

Using the cost data from the HSL survey, EPRI constructed an absolute poverty line specific to each province by generating a weighted average of the cost data from the different cities within each province for which data was collected (these are the cities in which a significant proportion of the population of the province is concentrated). First, the cities surveyed in the HSL survey were mapped to their provinces; several provinces

had cost data collected from more than one city (Western Cape, Eastern Cape, KwaZulu Natal, and Gauteng province), several provinces had cost data collected from one city only (Northern Cape, Free State, North West, and Limpopo province), and one province did not have cost data from any city (Mpumalanga). The cost data for Limpopo was used to proxy for the missing data in Mpumalanga, based on the geographic proximity of the two provinces and thus the assumption of similar costs of living. Then, the populations of the cities in the surveys were determined and verified. Subsequently, the cost data for those provinces with more than one city surveyed was then weighted according to the populations of the cities in order to arrive at one set of cost data for each province. The weighted cost data derived from the HSL survey was then merged with the Income and Expenditure 2000 database in order to calculate a minimum subsistence level. Thus, each household in the database has a uniquely determined poverty line, depending on the province of residence and the specific demographic makeup of the household.

The strength of the HSL cost data is that it allows researchers to account for differences in purchasing power across provinces. Furthermore, the HSL poverty line accounts for varying nutritional needs of different age-gender groups. Empirical evidence does suggest that the caloric requirements of children are less than that of adult males, and thus the *per capita* expenditure requirements are lower as well.[4]

Although there are still some institutions calculating minimum subsistence levels, recently there has been a shift away from the use of absolute poverty lines in favour of using relative poverty lines, due to concern over a number of methodological shortcomings associated with absolute poverty lines.

The most often cited problem is that absolute poverty lines require an extremely subjective assessment of what constitutes a minimally acceptable standard of living. For example, is the satisfaction of basic nutritional needs sufficient, or should an absolute poverty measure also include monetary allowances for important social expenditures such as education and health services? What about more abstract basic needs, such as the rights of self-determination, which are vitally important but difficult or impossible to quantify?

Another important methodological issue associated with absolute poverty lines is the problem of over generalisation. The poverty line applies to *all* units in the poverty domain, which means that differences related to particular sub-groups cannot be accounted for. An income that is sufficient in an urban setting may not be sufficient in a rural area, due to pronounced differences in purchasing power or varying basic needs. Furthermore, different social groups may have different tastes or eating habits, which may result in variations in their respective basic costs of living. This problem is particularly relevant in South Africa, where rural and urban and racial disparities are acute and historically entrenched. However, creating different poverty lines for different subgroups is probably not a feasible solution, as it involves additional levels of subjectivity and renders comparisons across subgroups less meaningful.

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[4] Woolard and Leibbrandt (1999).

Finally, the detailed cost data needed to construct an absolute poverty line may be difficult to collect or obtain in a developing country. Obtaining a national average of the cost of a basket of necessities is undoubtedly a difficult and time-consuming process, and in South Africa, only a handful of organisations have produced such data. For these aforementioned reasons, many researchers undertaking poverty analysis opt to use relative poverty lines, which define poverty in relation to other members of the poverty domain.

A relative poverty line can be defined as that income level that cuts off the specified poorest percentage of the population. The poor are those persons who suffer deprivation relative to others in the poverty domain.[5] For example, the World Bank generally defines the 'poor' as the bottom forty percent of households, and defines the "destitute" as the bottom twenty- percent of the income distribution. The relative poverty line is generally more widely used than the absolute poverty line, as it is much easier to construct. Furthermore, calculations with the relative poverty line are less likely to be controversial, as they avoid the subjectivity associated with determining what income or expenditure threshold constitutes a minimal acceptable standard of living.

For South Africa, the relative poverty line that delineates the bottom 40% of households is R459 per person per month in September 2000, when economies of scale and adult equivalency scales are applied. Without economies of scale and adult equivalency scales, the comparable figure is R345 per person per month.   The comparable figures for income poverty are R423 (with scales) and R319 per person per month (without scales).

METHODOLOGICAL ISSUES: INCOME VERSUS EXPENDITURE POVERTY
Another methodological issue to address when constructing a poverty line is whether income or expenditure more accurately captures the extent of consumption poverty experienced by households. As Ravallion (1992) and Deaton (1997) suggest, expenditure may be the preferred measure in developing countries. First, expenditure is a much more direct measure of consumption than income, and thus may more accurately reflect the degree of commodity deprivation and provide a more reliable indicator of household welfare. Whether a household or individual consumes enough of basic needs (food) is more directly related to their welfare than how much income they earn.   Second, reporting of income is notoriously flawed, for a number of different reasons. Accounting for all sources of income, including such diverse sources as different types of private transfers such as loans, remittances, and inheritances, wages, returns on capital, gifts-in-kind and in cash, and employee benefits, is difficult in any setting, and is perhaps made even more difficult in developing countries where the resources for data collection are more limited. Furthermore, there is some evidence that respondents in surveys systematically underreport income, though the exact motives underlying this dynamic is unclear.   Finally, there is some evidence that expenditure is more stable and perhaps more reliable than income, particularly amongst the poor.   During times of economic hardship, people are likely to undertake consumption-smoothing activities, such as borrowing or using savings (Ravallion, 1992). Thus, expenditure may provide a more accurate measure of well being than income. Indeed, two important papers written on the topic of measuring poverty in South Africa

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[5] Woolard and Leibbrandt (1999).

(NIEP, 2001; Woolard and Leibbrandt, 1999) both select the expenditure measure for the aforementioned reasons.

However, using income as an indicator of welfare may also be useful in specific situations. This study seeks to measure the impact of specific poverty interventions on the face of poverty in South Africa. In South Africa, the means test for qualifying for social grants is determined using income rather than expenditure. Thus, for the purposes of this study it may be more intuitively obvious to use income thresholds to determine who is poor, as this is the method by which social assistance grants are allocated. Furthermore, social grants directly raise income by 100% of the value of the grant, while only raising expenditure by a proportion. EPRI has thus chosen to use both measures, which is also important for the purpose of confirming the robustness of the results.

METHODOLOGICAL ISSUES: EQUIVALENCE SCALES

Researchers working with poverty lines have grappled with the issue of accounting for possible age and gender-based differences in consumption behaviour. If it is indeed the case that children and women cost less than adult males, should children and women be weighted as less than one adult male equivalent for the purposes of deriving a poverty line? If so, how should the exact magnitude of the weights be determined? International research suggests that children may consume less food than adult males, but does this relationship necessarily hold with respect to non-food expenditure? Another dynamic that researchers have attempted to quantify is the effect of economies of scale. Household size may affect the consumption needs of households in a non-linear relationship; larger households may need less income on a per capita basis than smaller households, due to the effect of economies of scale. Many expenses may not depend on the size of the family (for example, rent, or in some cases fuel), and thus larger households benefit as these shared costs are spread over a greater number of people than in a smaller household.

In some of the literature concerned with deriving a poverty line for South Africa, the convention has been to weight children under eighteen as half of an adult equivalent, while applying an exponential scale of 0.9 to account for economies of scale, as in the work of May et al (1995). However, these numbers are not grounded in any empirical studies of household economies in South Africa. Thus, applying equivalence scales may or may not be appropriate for poverty analysis in South Africa, in the absence of more specific analysis of South Africa's consumption patterns and the intra-household allocation of resources.

As indicated earlier, the purpose of the discussion here is not to determine an appropriate poverty line for South Africa, but instead to highlight some of the methodological issues associated with selecting a poverty line. Indeed, in the interests of systematic rigour and reliability, EPRI has chosen to use several different poverty lines for the impact analysis in this study, both absolute and relative. Both relative and absolute poverty lines require the definition of a specific income or expenditure threshold, which involves an element of arbitrariness. Measured poverty rates may be very sensitive to small changes in the poverty datum, depending on the shape of the income distribution in the poverty domain. Thus, using a number of different poverty

lines is important to confirm the robustness of the results when measuring the impact of different poverty interventions

METHODOLOGICAL ISSUES: THE POVERTY HEADCOUNT AND OTHER POVERTY MEASURES

The poverty headcount, which is simply the number of individuals or households falling below a given income/expenditure threshold, provides a conceptual tool in quantifying the extent of deprivation within a country. However, using the poverty line to determine the poverty headcount has a number of shortcomings, particularly when measuring changes in poverty over time. EPRI has chosen to supplement the poverty headcount with a number of other poverty measures that together paint a fuller picture of the face of poverty in South Africa.

The poverty datum line sets a particular income or expenditure threshold, which delineates whether or not a household is considered poor. However, those households and individuals who arguably need the most assistance (the poorest) may not move above the poverty line after a given poverty intervention. A household may gain a Child Support Grant under a new policy, but this R100 extra per month may not cause the new household income to exceed the poverty threshold. Yet this increase in income may indeed result in a qualitative change in the household's welfare, an improvement that is not captured by the poverty headcount measure. Thus, a poverty intervention that is well targeted (i.e. impacts the poorest) may actually result in a much smaller change in the poverty rate than a less well targeted intervention (i.e. impacts the wealthiest of the poor whose incomes are clustered near the poverty line). Undoubtedly, the effect of poverty interventions on the poorest is likely to be of interest to policymakers; for this reason, EPRI has supplemented the poverty headcount measure with a number of different poverty gap measures.

The poverty gap measures the difference between a household's income (or expenditure) and the poverty line. By using a poverty gap measure, the impact of a poverty intervention is captured regardless of whether a household moves above the poverty line, as the household's poverty gap will be reduced by the exact amount of the grant (at least up to the point where the household escapes poverty). This study uses three different kinds of poverty gap measures. First, the average poverty gap measures the difference between the households' total incomes and the poverty line, then takes the average of the differences over a given domain (for example, a province). Second, the percentage poverty gap takes each household's poverty gap and divides it by the poverty line, and calculates the average across all households. Finally, the total rand poverty gap aggregates the poverty gap of each household over a given domain. This figure is particularly useful to policymakers, as it allows them to estimate of the aggregate cost of a particular policy intervention, assuming perfect targeting. Using both poverty gap measures and the poverty headcount measure provides a more nuance understanding of the poverty-reducing impact of policy interventions.

2.3) THE EPRI MICRO-SIMULATION MODEL

The EPRI micro-simulation model was calibrated using three data sources: Statistics South Africa's September 2000 *Income and Expenditure Survey*, the September 2000 *Labour Force Survey* and administrative data from the Department of Social Development. The *Income and Expenditure Survey* (I&E) provides measures of social assistance take-up as well as detailed profiles of the income and expenditure patterns of the surveyed households. The *Labour Force Survey* provides the additional demographic information required to determine eligibility for the social assistance grants; furthermore, it provides detailed information on labour market activity and various measures of well-being such as access to public services. The Department of Social Development's administrative data provides actual take-up figures by grant by province, as well as additional information.

THE MICRO-SIMULATION MODEL: POVERTY LINES

In consultation with the Department of Social Development, EPRI selected several poverty lines for the analysis. The absolute poverty line is based on the *Household Subsistence Level Survey*. The destitution poverty line is based on household expenditure; calculating relative destitution based on the lowest income 20% of households in the income distribution. This lower bound poverty line (or "destitution" poverty line) supports the analysis of proposed policy changes on the poorest segment of society. The destitution line is scaled—that is, it is adjusted for economies of scale and adult equivalency factors. The rand amount that resulted in 20% of households in the population being designated as "poor" is R180 per person per month. In addition, a relative expenditure poverty line was calculated based on the threshold separating the lowest expenditure 40% of households. Scaled and unscaled income and expenditure poverty lines were calculated based on the terms of reference of the Taylor Committee of Inquiry, set at R394 per person per month.[6] The income and expenditure scaled poverty lines apply the economies of scale and adult equivalency scales.[7] These poverty lines, while not exhaustive, cover a range of the methodological issues discussed in the previous section. Furthermore, the use of different poverty lines allows the measurement of the sensitivity of the results.

The main purpose of the EPRI micro-simulation model is to assess the impact of the current system of social grants on poverty alleviation, as well as to gauge the potential impact of proposed policy reforms and poverty interventions. The scenarios modelled using the micro-simulation tool were developed in consultation with working group meetings at the Department of Social Development, and focus on three social assistance grants: the State Old Age Pension (SOAP), the Child Support Grant (CSG), and the Disability Grant (DG). This section of the report will review the methodology underlying the micro-simulation modelling generally and for each specific grant, as well as discuss some of the difficulties encountered during the task of calibrating the model with household survey data.

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[6] This figure is slightly different from the stated figure R401 per capita, as it has been deflated to September 2000 terms using Statistics South Africa's inflation series data.
[7] The adult equivalency scale is set at 0.5 and the economies of scale figure is set at 0.9.

THE MICRO-SIMULATION MODEL: AN OVERVIEW OF THE MODELLING SCENARIOS

In this study's analysis, the baseline scenario is taken to be the level of social assistance take-up in September 2000, as measured using the *Income and Expenditure Survey*. In September 2000, an estimated 2.7 million individuals were receiving some sort of social assistance grant, with approximately 460,000 CSG recipients, 440,000 DG recipients, and 1.8 million SOAP recipients. In all of the modelling scenarios, these take-up rates are used as the baseline against which the impact of all other policy reforms/modelling scenarios are evaluated and compared.

Using the poverty lines detailed above, EPRI researchers measured the poverty-reducing impact of a variety of possible scenarios with the CGS, DG, and the SOAP. The first scenario evaluated the extent to which the social security system reduced the extent of measured poverty in September 2000. The *Income and Expenditure Survey* contains detailed information on the income of households, including the monetary amount of each social assistance grant received. In September 2000, this amount was R100 per recipient per month for the CSG and R540 per recipient per month for both the DG and the SOAP. By removing the monetary amount of all social grants from the total household income and subsequently measuring the resulting poverty in the absence of all social assistance, the study quantifies the impact of the social security system in September 2000.

In addition, the EPRI micro-simulation model was used to simulate the effect of increased take-up of each grant, such as a 10% increase in take-up of the SOAP, a 50% increase in the take-up of the DG, and increases to full take-up for all the grants. The simulation of full take-up of each grant under the existing eligibility criteria (making strong assumptions) provides a sense of the upper bound of the poverty impact of the social security programme. In addition, the effects of policy reforms (the extension of the CSG to children up to age 14 in several stages, as well as the hypothetical extensions to age 16 and age 18) were modelled and the poverty impact measured. Each modelling scenario was analysed using the poverty lines discussed above. The poverty headcount, as well as the average, rand, and percentage poverty gap, were calculated for each scenario, in order to provide a detailed picture of the poverty impact of each scenario. The simulations evaluate the impact of extensions in scope and increases in take-up of the grants, not in changes in grant amount, with the exception of the CSG, for which both real 2000 and real 2003 grant amounts were evaluated.

THE STATE OLD-AGE PENSION

According to the guidelines obtained from the Department of Social Development, eligibility for the SOAP is determined according to both an age and a means test. During the sample period male recipients had to be over 65 years of age, while female recipients had to be over 60 years of age. In addition, if the individual was single his/her income must have fallen below R1226 per month, and if the individual was married his/her income must have fall below R2226 per month. The median amount of

the grant in September 2000 was R540 per recipient per month. According to this particular eligibility criterion, there were approximately 2.2 million age and income eligible SOAP recipients in South Africa in September of 2000. Of these eligible recipients, nearly 1.8 million were already receiving the grant in September 2000, while approximately 400,000 were eligible but not receiving the grant. Unlike with the CSG and the DG, the take-up rate for the SOAP in September 2000 was already quite high, over eighty percent of the total number of eligible recipients. Table 2.4 below breaks down the number of grants and the resulting take-up rate by province:

Table 2.4: Take-up of State Old-Age Pension by Province, September 2000

National/ Province	# Grant Recipients, take-up rate	Number (#) of eligible recipients	Take-up rate	# of eligible recipients not receiving SOAP
National	**1767591**	**2185321**	**80.9%**	**417730**
Western Cape	115210	144048	80.0%	28838
Eastern Cape	359973	440935	81.6%	80962
Northern Cape	30040	37530	80.0%	7490
Free State	93003	115723	80.4%	22720
KwaZulu Natal	358184	445656	80.4%	87472
Northwest	139114	167269	83.2%	28155
Gauteng	304931	414663	73.5%	109732
Mpumalanga	97852	110697	88.4%	12845
Limpopo	269284	308800	87.2%	39516

Source: Income & Expenditure 2000

THE CHILD SUPPORT GRANT

Modelling Child Support Grant scenarios with the model raised methodological and data quality issues. The *Income and Expenditure Survey* does not collect data on the different child-related grants separately, but rather aggregates them together under one category. As a result, the analysis of the baseline September 2000 take-up rates cannot differentiate between recipients of the CSG, the Foster Care Grant, and the Care Dependency Grant in September 2000. In addition, neither the *Income and Expenditure Survey* nor the *Labour Force Survey* contains information on the identity of the primary caregiver of the child. EPRI's model bases take-up analysis on household *income or expenditure vulnerability*; assigning grants to those households (with an age-eligible child) whose total income falls below that of the particular poverty line used for the analysis.

Table 2.5: Take-up of Child Support Grant by Province, September 2000

National/ Province	# of grant recipients	# of eligible grant recipients, aged 0-7	Take-up rate	# of those eligible but not receiving CSG
National	**463699**	**3069536**	**15.1%**	**2605837**
Western Cape	59407	103868	57.2%	44461
Eastern Cape	63038	658966	9.6%	595928
Northern Cape	19734	42676	46.2%	22942
Free State	18573	171027	10.9%	152454
KwaZulu Natal	70660	808375	8.7%	737715
Northwest	34341	196209	17.5%	161868
Gauteng	107493	386601	27.8%	279108
Mpumalanga	43704	185113	23.6%	141409
Limpopo	46749	516701	9.0%	469952

Source: Income & Expenditure 2000

The number of eligible grant recipients using the HSL poverty line to determine income vulnerability was estimated at 3 million children. Of those 3 million, approximately 2.6 were eligible but not yet receiving the grant as of September 2000. Thus, the take-up rate of the grant was quite low in September 2000, at around 15% of all those who were eligible at the time, although with considerable variation across provinces. However, unlike with the SOAP, the take-up rate of the CSG has increased significantly over the past several years. The concerted efforts of the national and provincial governments, and the Department of Social Development in particular, have helped to multiply the total number of grants, although there are disparities between different provinces with respect to growth rates.

The model simulated full take-up of the CSG under the current eligibility criteria (children aged 0-7). The impact of this simulation depends on the poverty line selected, not only because the actual income/expenditure threshold differs, but also because the number of potentially eligible recipients will vary. The model assigned a grant to all the households in the database with an age-eligible child falling below the poverty line (but who were not receiving the CSG) and then compared the resulting poverty measures against the baseline poverty measures. Additionally, the model simulated full take-up of the CSG grant up to age 9, up to age 11, and up to age 14, in accordance with the incremental phase-in of the recent CSG extension to children aged up to 14 years. In addition, the model simulates the impact of the extension of the CSG up to age 16 and up to age 18.

THE DISABILITY GRANT

Modelling the disability grant required strong assumptions to identify qualifying grant recipients. Neither the *Income and Expenditure Survey* nor the *Labour Force Survey* have any questions providing adequate medical information necessary to determine who is considered disabled and thus who is eligible to receive a DG. Consistent with the methodology identified by Ingrid Woolard[8], the model designates an individual as "disabled" if the individual stated that he or she was not working because he/she was too sick to work in response to a question in the *Labour Force Survey*.[9]

There were an estimated 780,000 individuals who were eligible for the disability grant but were not yet recipients in September 2000. Additionally, there were approximately 440,000 individuals already receiving the DG in September 2000. Table 2.6 below illustrates the number of grant recipients, the number of eligible grant recipients not yet receiving the grant, and the take-up rate by province.

Table 2.6: Take-up of Disability Grant, September 2000

National/ Province	# grant recipients	# eligible for the DG but not receiving it in Sep 2000	Take-up rate	Total # of eligible DG recipients
National	**438542**	**780318**	**36.0%**	**1218860**
Western Cape	70442	55546	55.9%	125988
Eastern Cape	78664	150466	34.3%	229130
Northern Cape	20076	22818	46.8%	42894
Free State	20069	54619	26.9%	74688
KZN	97038	158093	38.0%	255131
Northwest	34942	74196	32.0%	109138
Gauteng	61745	136145	31.2%	197890
Mpumalanga	20091	52758	27.6%	72849
Limpopo	35475	75677	31.9%	111152

Source: Income and Expenditure September 2000 & Labour Force Survey Sept. 2000

Thus, the total number of individuals eligible to receive the DG (including those who were already receiving the grant in September 2000) is estimated at 1.2 million individuals. The model simulates the impact of a 50% increase in take-up from the baseline take-up, to approximately 650,000 grants in total. Similarly, the model simulates an increase to full take-up

2.4) THE IMPACT OF SOUTH AFRICA'S SOCIAL SECURITY SYSTEM

The first phase used the micro-simulation model to assess the impact of the existing social security system under the take-up rates of September 2000. To do so, the model calculated total income exclusive of all forms of grant income (CSG, DG, and SOAP) for all grant-receiving households. By calculating the resulting poverty

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[8] At a workshop for the DoSD, July 2003.
[9] Question 3.1 in Statistic South Africa's September 2000 *Labour Force Survey*, labelled as variable "Q31YnotW" in the data set.

headcount and the poverty gap measures in the absence of social assistance, the model effectively quantifies the impact of the current system of grants, under September 2000 take-up rates. This analysis used the poverty lines established in conjunction with the DoSD and described above.

Tables 2.7, 2.8, 2.9, and 2.10 below illustrate the impact of simulating the scenario of "no social security" on the poverty headcount, the average poverty gap, the poverty gap ratio, and the rand poverty gap. The calculations provided in the Tables were performed using the Household Subsistence Level poverty line, which is an absolute poverty line. (Tables of the calculations for the other poverty lines are provided in the main report.) As discussed earlier, the poverty line for each family varies according to its demographic makeup and the province of residence. Though the poverty line varies for each household, the estimated median poverty line amounts to R311 per person per month.

Table 2.7: The Impact of Social Security on the Poverty Headcount (HSL)

HSL POVERTY HEADCOUNT								
Sep 2000 I&E			NO SOCIAL SECURITY SYSTEM					
Province	Poverty Headcount		Poverty Headcount, No grants		# freed from poverty by current system		As % of impoverished (no grants)	
	HH	IND	HH	IND	HH	IND	HH	IND
National	4695548	21447959	5125332	23103999	429784	1656040	8.4%	7.2%
Western Cape	182896	796774	234085	987819	51189	191045	21.9%	19.3%
Eastern Cape	941734	4399279	999643	4619852	57909	220573	5.8%	4.8%
N. Cape	86207	329139	98621	376195	12414	47056	12.6%	12.5%
Free State	359286	1410382	373810	1464066	14524	53684	3.9%	3.7%
KZN	985680	5077774	1069753	5422462	84073	344688	7.9%	6.4%
Northwest	336345	1536181	369276	1640621	32931	104440	8.9%	6.4%
Gauteng	827596	3279787	923048	3639692	95452	359905	10.3%	9.9%
Mpumalanga	301344	1405136	329776	1524800	28432	119664	8.6%	7.8%
Limpopo	674460	3213507	727320	3428492	52860	214985	7.3%	6.3%

Source: EPRI Micro-simulation model (with 2000 I&E data)

In the absence of social security, an estimated additional 430,000 households and 1.66 million individuals would be in poverty. Thus, the current social assistance grants reduce poverty 8.4% (households) and 7.2% (individuals) from the baseline, respectively. There is also considerable variation across provinces, with the Western Cape exhibiting the highest rate of poverty reduction (21.9% of the households) and the lowest simulated poverty headcount reduction calculated is in the Free State (3.9% of the households). As Table 2.8 below indicates, the current social security programmes reduce the average poverty gap by over 22%. The poverty gap measures the distance between each household's poverty line and its total income, and the average poverty gap is merely the average of all the household poverty gaps over a given domain.

Table 2.8: The Impact of Social Security on the Average Poverty Gap (HSL)

HSL AVERAGE POVERTY GAP							
Excluding Grant Income			*Including Grant Income*			*Change*	
	Median	Mean		Median	Mean	Median	Mean
National	625.7	728.0	National	482.5	566.4	22.9%	22.2%
Western Cape	465.1	534.5	Western Cape	310.7	392.4	33.2%	26.6%
Eastern Cape	756.7	824.8	Eastern Cape	540.5	615.5	28.6%	25.4%
Northern Cape	639.0	692.1	Northern Cape	423.5	486.1	33.7%	29.8%
Free State	643.0	715.6	Free State	533.0	586.6	17.1%	18.0%
KZN	632.3	766.0	KZN	495.8	609.4	21.6%	20.4%
Northwest	648.8	751.7	Northwest	461.9	551.8	28.8%	26.6%
Gauteng	531.0	636.5	Gauteng	427.7	524.4	19.5%	17.6%
Mpumalanga	553.8	655.6	Mpumalanga	433.6	510.8	21.7%	22.1%
Limpopo	663.3	748.3	Limpopo	496.7	564.8	25.1%	24.5%

Source: EPRI Micro-simulation model (with 2000 I&E data)

The percentage reduction in the average poverty gap is much greater than the comparable reduction in the poverty headcount as exhibited in Table 2.7. The social assistance grants may only move some grant-receiving households above the poverty line, and although many others are likely to experience an improvement in living standards, this change is not accounted for in the poverty headcount measure. By contrast, the poverty gap measure captures the effect of the poverty intervention on all poor households, and thus provides a fuller picture of the poverty impact of the social assistance programmes.

Another poverty measure illustrated in Table 2.9 below is the poverty gap ratio, which takes the poverty gap and divides it by the poverty line, thus measuring poverty as a ratio of the distance between income and the poverty line, and the poverty line itself. The current social security system reduces the poverty gap ratio by 13.6 percentage point (median) or, alternatively, 14.6 percentage points (mean).

Table 2.9: The Impact of Social Security on the Poverty Gap Ratio (HSL)

HSL POVERTY GAP RATIO							
Excluding Grant Income			*Including Grant Income*			*Change*	
	Median	Mean		Median	Mean	Median	Mean
National	**59.4%**	**58.0%**	**National**	**44.8%**	**44.3%**	**14.6%**	**13.6%**
Western Cape	44.6%	48.1%	Western Cape	29.6%	33.7%	15.0%	14.4%
Eastern Cape	71.7%	66.8%	Eastern Cape	50.1%	49.3%	21.6%	17.6%
Northern Cape	60.1%	59.2%	Northern Cape	38.5%	41.3%	21.6%	17.9%
Free State	65.1%	61.2%	Free State	52.2%	50.2%	12.8%	11.0%
KZN	56.6%	56.3%	KZN	44.6%	43.8%	12.0%	12.5%
Northwest	63.4%	61.9%	Northwest	43.9%	44.6%	19.5%	17.3%
Gauteng	48.2%	49.9%	Gauteng	39.2%	40.8%	9.0%	9.1%
Mpumalanga	50.1%	51.1%	Mpumalanga	39.7%	39.1%	10.4%	12.0%
Limpopo	62.8%	60.7%	Limpopo	45.4%	44.9%	17.4%	15.8%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Finally, Table 2.10 below illustrates the impact of the current social assistance programmes on the rand poverty gap. The rand poverty gap aggregates the household poverty gaps over a given domain (national and provincial).

Table 2.10: The Impact of Social Security on the Rand Poverty Gap (HSL)

HSL RAND POVERTY GAP					
Excluding Grant Income		*Including Grant Income*		*Change*	
				Gross	Percent
National	**44566**	**National**	**31756**	**12810**	**28.7%**
Western Cape	1485	Western Cape	850	635	42.8%
Eastern Cape	9877	Eastern Cape	6941	2937	29.7%
Northern Cape	820	Northern Cape	504	316	38.6%
Free State	3191	Free State	2514	678	21.2%
KZN	9806	KZN	7182	2624	26.8%
Northwest	3313	Northwest	2214	1099	33.2%
Gauteng	6970	Gauteng	5147	1823	26.2%
Mpumalanga	2581	Mpumalanga	1841	740	28.7%
Limpopo	6522	Limpopo	4564	1958	30.0%

Source: EPRI Micro-simulation model (with 2000 I&E data)

The current social security system reduces the rand poverty gap by 29%. The rand poverty gap is a particularly useful measure, as it provides a lower bound for the gross cost of eliminating poverty through social grants. In this case, this figure is estimated to be roughly 12.8 billion dollars, based on the relatively low Household Living Standards poverty line.

Table 2.11 below compares the poverty reducing impact of the current social security system as measured with the different poverty lines included in the analysis. The Table includes the poverty headcount and poverty gap measures at the national level. The complete set of calculations for all the poverty lines are provided in the full report.

Table 2.11: The Impact of Social Security on Poverty (poverty line comparison)

REDUCTION IN POVERTY MEASURES				
Poverty Measure	*HSL*	*Com. Of Inquiry, income poverty, equivalence scales*	*Com. of Inquiry, expenditure poverty, no equivalence scales*	*Destitution, expenditure poverty, no equivalence scales*
Poverty Headcount Individual, % reduction	7.2%	7.0%	4.3%	19.6%
Average Poverty Gap % Reduction (median)	22.9%	20.8%	11.7%	27.8%
Poverty Gap Ratio, % point reduction	14.6%	15.4%	10.2%	18.8%
Rand Poverty Gap, % reduction	28.7%	28.7%	18.0%	45.0%

Source: EPRI Micro-simulation model (with 2000 I&E data)

As Table 2.11 illustrates, the magnitude of the poverty reduction varies with the choice of a poverty line. The results calculated with the absolute poverty line (average of R311 per person) and the Committee of Inquiry income poverty line (R394 per adult equivalent) are fairly comparable. The Committee of Inquiry expenditure poverty line without equivalence scales is effectively a much higher poverty line, as the equivalence scales operate to lower the household's poverty line by lowering the number of adult equivalents. Thus, as expected, the measured poverty impact is smaller since the poverty line is higher. Finally, the destitution poverty line is the lowest of the poverty lines, and thus the measured poverty impact is the greatest. Destitution is defined as the bottom 20% of the expenditure distribution, and the resulting destitution poverty line is R180 per person per month. The analysis with the destitution poverty line allows us to gauge the impact of the current social security system on the poorest sector of society. The current social security system with September 2000 levels of take-up effectively reduces the rand destitution gap by 45.0%.

2.5) SIMULATIONS OF SOUTH AFRICA'S SOCIAL SECURITY REFORM OPTIONS

EPRI, in consultation with the Department of Social Development project management team, identified eleven scenarios of possible social security reform, and EPRI modelled the poverty impact of these reforms using seven different poverty lines. The eleven scenarios are:

(1)   An increase of ten percentage points in the take-up rate of the SOAP
(2)   Full take-up of the SOAP
(3)   Full take-up of the CSG to age 7
(4)   Full take-up of the CSG to age 9
(5)   Full take-up of the CSG to age 11
(6)   Full take-up of the CSG to age 14
(7)   Full take-up of the CSG to age 16
(8)   Full take-up of the CSG to age 18
(9)   An increase in take-up of the Disability Grant by 50%
(10)   Full take-up of the Disability Grant
(11)   Full take-up of all grants, including the CSG to age 14.

The poverty impact of each of these scenarios is modelled using seven different poverty lines. The Committee of Enquiry poverty line is based on the R394 per month per adult equivalent identified by the Taylor Committee. The poverty lines included in the analysis are:

(1)   The Committee of Enquiry expenditure poverty line (with no scales)
(2)   The Committee of Enquiry expenditure poverty line (with scales)
(3)   The Committee of Enquiry income poverty line (with no scales)
(4)   The Committee of Enquiry income poverty line (with scales)
(5)   The destitution poverty line (with scales)
(6)   The HSL expenditure line
(7)   The relative expenditure poverty line (with scales).

The choice of poverty line is largely normative, because the subjective elements in identifying a baseline level of income or expenditure outweigh the objective analysis. For this reason, the study focuses largely on the Committee of Enquiry's poverty line. For balance, the study also evaluates the results using an absolute poverty line (HSL), a relative poverty line and a destitution line. Low poverty lines—like the HSL, the destitution line, the relative poverty line and the scaled poverty lines—tend to demonstrate a greater impact of social grants. Absolute poverty lines tend to involve detailed levels of subjectivity, while the relative poverty line requires only one subjective judgement—the proportion of the population that is poor. Techniques are available that do not require the identification of a poverty line—but the abstract nature of the associated analysis often detracts from policy relevance. Based on consultation with the Department of Social Development, the methodology of analysing a number of different poverty lines was adopted. The results of this analysis are discussed below.

THE STATE OLD-AGE PENSION

For the State Old Age Pension, the study analysed two simulations using the EPRI model. The first simulated the effect of a 10% increase in take-up of the grant, and the second simulated full take-up. The 10% increase in take-up has a fairly small poverty impact, as only 171,542 grants are assigned. Tables 2.12 to 2.15 illustrate the poverty impact of full take-up of the SOAP, using the Committee of Inquiry expenditure poverty line of R394 per person per month (no equivalence scales).

Table 2.12: The Impact of Full Take-up of the SOAP

SOAP with full take-up, using Committee of Inquiry expenditure poverty line no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**1767591**	**4887482**	**25326696**	**417730**	**23.6%**	**68228**	**222655**	**1.4%**	**0.9%**
Western Cape	115210	252428	1317759	28838	25.0%	4643	11430	1.8%	0.9%
Eastern Cape	359973	951191	4755398	80962	22.5%	16133	45386	1.7%	1.0%
Northern Cape	30040	88744	388319	7490	24.9%	2108	6435	2.4%	1.7%
Free State	93003	356495	1538747	22720	24.4%	2238	4493	0.6%	0.3%
KwaZulu-Natal	358184	1047001	6074197	87472	24.4%	12947	35725	1.2%	0.6%
Northwest	139114	376658	1878601	28155	20.2%	6589	26278	1.7%	1.4%
Gauteng	304931	796871	4028132	109732	36.0%	15933	68531	2.0%	1.7%
Mpumalanga	97852	305035	1656114	12845	13.1%	1720	6169	0.6%	0.4%
Limpopo	269284	713059	3689429	39516	14.7%	5917	18208	0.8%	0.5%

Source: EPRI Micro-simulation model (with 2000 I&E data)

As illustrated by Table 2.12 above, the simulated full take-up of the SOAP increases the number of new grants by 417,730. Additionally, full take-up lifts an estimated 222,655 individuals out of poverty, which constitutes a 0.9% reduction in the individual poverty headcount at the national level. The poverty headcount reduction is

most substantial in Gauteng, the wealthiest province, because a greater number of households in this province have incomes close to the poverty line.

Table 2.13: Full Take-up of the SOAP and the Average Poverty Gap

SOAP with full take-up, using Committee of Inquiry expenditure poverty line no scales

	Average household rand poverty gap							
	Statistics SA I&E 2000		Micro-simulation model		Rand difference		% change	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
National	**860**	**1080**	**836**	**1053**	**24**	**27**	**2.8%**	**2.5%**
Western Cape	588	755	580	743	37	12	6.3%	1.6%
Eastern Cape	997	1176	960	1143	37	33	3.7%	2.8%
Northern Cape	704	898	701	880	3	18	0.4%	2.0%
Free State	826	967	792	941	33	26	4.0%	2.7%
KwaZulu-Natal	995	1289	979	1259	16	30	1.6%	2.3%
Northwest	803	1038	782	1011	21	27	2.6%	2.6%
Gauteng	566	828	552	796	15	32	2.6%	3.9%
Mpumalanga	853	1057	836	1045	17	12	2.0%	1.1%
Limpopo	998	1154	981	1133	17	21	1.7%	1.9%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Table 2.13 above shows the change in the average poverty gap after the simulated full take-up of the SOAP. As the table indicates, the reduction in the average poverty gap is quite small, a percentage reduction of 2.8% at the national level, and varying across the provinces—from a low of a 0.4% reduction in the Northern Cape to a high of a 6.3% reduction in the Western Cape. The effect in the Western Cape is so significant because a large proportion of a relatively small number of very poor households qualify for the SOAP. Table 2.14 below illustrates the similar changes in the percentage poverty gap as a result of the simulation. Comparison of this table with the one above underscores the differences between the rand poverty gap and the percentage poverty gap. The reduction in the percentage poverty gap is greatest for Gauteng, but again smallest for the Northern Cape.

Table 2.14: Full Take-up of the SOAP and the Percentage Poverty Gap

SOAP with full take-up, using Committee of Inquiry expenditure poverty line no scales

	Average household percentage poverty gap							
	Statistics SA I&E 2000		Micro-simulation model		% point difference		% change	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
National	**50.5%**	**48.6%**	**49.1%**	**47.3%**	**1.5%**	**1.3%**	**2.9%**	**2.7%**
Western Cape	34.6%	35.5%	33.8%	34.6%	0.8%	0.9%	2.2%	2.4%
Eastern Cape	58.1%	54.9%	56.3%	53.1%	1.8%	1.8%	3.1%	3.3%
Northern Cape	47.2%	47.2%	46.7%	46.1%	0.5%	1.1%	1.0%	2.4%
Free State	56.4%	53.2%	55.3%	51.8%	1.2%	1.4%	2.1%	2.6%
KwaZulu-Natal	53.2%	50.8%	51.6%	49.4%	1.6%	1.4%	3.1%	2.8%
Northwest	48.6%	48.3%	47.1%	46.9%	1.5%	1.3%	3.1%	2.8%
Gauteng	37.7%	38.3%	35.6%	37.0%	2.1%	1.3%	5.6%	3.4%
Mpumalanga	46.3%	44.9%	45.5%	44.3%	0.8%	0.5%	1.7%	1.2%
Limpopo	55.6%	52.7%	54.3%	51.7%	1.3%	1.1%	2.3%	2.0%

Table 2.15 below shows the impact of the simulation on the rand poverty gap. The simulated full take-up of the grant results in a decrease in the rand poverty gap of approximately 1.6 billion rand, representing a 2.5% reduction from the baseline.

Table 2.15: Full Take-up of the SOAP and the Total Rand Poverty Gap

	Total rand poverty gap (R millions)			
	Statistics SA I&E 2000	Micro-simulation	Rand difference	% change
National	**63368**	**61791**	**1578**	**2.5%**
Western Cape	2288	2251	37	1.6%
Eastern Cape	13429	13052	377	2.8%
Northern Cape	956	937	19	2.0%
Free State	4137	4026	111	2.7%
KwaZulu-Natal	16203	15825	378	2.3%
Northwest	4692	4570	122	2.6%
Gauteng	7917	7612	306	3.9%
Mpumalanga	3869	3825	44	1.1%
Limpopo	9876	9693	183	1.9%

The table below compares the impact of the 10% increase in the State Old Age Pension across all seven poverty lines for the various measures of poverty reduction. The greatest measured impact is reflected by the destitution poverty line—a 3.6% reduction in the median average household rand poverty gap, and a 3.9% reduction in the average household percentage poverty gap. The aggregate poverty gap falls by 3.2% as measured using the destitution line. By contrast, the unscaled Committee of Inquiry expenditure poverty line indicates only a 1.2% reduction in the aggregate poverty gap.

Table 2.16: SOAP with 10% increase in take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	0.5%	0.4%	0.2%	0.2%	1.4%	1.2%	1.4%	1.3%	1.2%
Comm. of Inquiry expenditure (scales)	1.4%	1.3%	0.5%	0.6%	2.4%	2.3%	2.2%	2.1%	2.3%
Comm. of Inquiry income	0.5%	0.3%	0.2%	0.2%	1.6%	1.3%	1.4%	1.3%	1.3%
Comm. of Inquiry income (scales)	1.1%	0.9%	0.4%	0.4%	3.6%	2.3%	2.9%	2.1%	2.3%
Destitution expenditure (scales)	2.2%	2.4%	0.4%	0.7%	3.6%	3.2%	3.9%	2.8%	3.2%
HSL expenditure	1.4%	1.4%	0.5%	0.6%	2.5%	2.2%	2.2%	2.0%	2.2%
Relative expenditure (scales)	0.9%	0.7%	0.4%	0.3%	2.5%	1.9%	1.8%	1.8%	1.9%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Likewise, the table below compares the impact of full take-up of the State Old Age Pension across all seven poverty lines for the various measures of poverty reduction. The effects are about twice as large as those for the 10% increase in the SOAP take-up rate. Again, the greatest measured impact is reflected by the destitution poverty line—a 6.7% reduction in the median average household rand poverty gap, and a 7.1% reduction in the average household percentage poverty gap. The aggregate poverty gap falls by 6.2% as measured using the destitution line. By contrast, the unscaled Committee of Inquiry expenditure poverty line indicates only a 2.5% reduction in the aggregate poverty gap. Results at a provincial level for all the poverty lines are reported in the appendix.

Table 2.17: SOAP with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	1.4%	0.9%	0.6%	0.5%	2.8%	2.5%	2.9%	2.7%	2.5%
Comm. of Inquiry expenditure (scales)	2.9%	2.5%	1.0%	1.1%	4.9%	4.5%	4.7%	4.3%	4.5%
Comm. of Inquiry income	1.2%	0.7%	0.6%	0.4%	3.2%	2.5%	3.0%	2.7%	2.5%
Comm. of Inquiry income (scales)	2.4%	1.8%	0.9%	0.9%	6.8%	4.5%	5.4%	4.3%	4.5%
Destitution expenditure (scales)	4.5%	4.5%	0.9%	1.3%	6.7%	6.2%	7.1%	5.6%	6.2%
HSL expenditure	2.8%	2.7%	1.1%	1.3%	4.9%	4.3%	4.3%	4.1%	4.3%
Relative expenditure (scales)	2.0%	1.5%	0.8%	0.8%	5.1%	3.8%	3.4%	3.7%	3.8%

Source: EPRI Micro-simulation model (with 2000 I&E data)

CHILD SUPPORT GRANT

For the Child Support Grant, the study analyses several simulations, developed in consultation with the DoSD. The first models full take-up of the CSG grant under the September 2000 eligibility criteria (children aged up to 7). Next, the model simulates full take-up of the grant among children up to age 9, up to age 11, and up to age 14, in accordance with the incremental phase-in of the recent CSG extensions. Additionally, EPRI simulated the full take-up of the grant among all poverty-vulnerable children through age 16 and through age 18.

FULL TAKE-UP CSG 0-7

Full take-up of the CSG among eligible children aged 0-7, calculated using the Committee of Inquiry unscaled expenditure poverty line, results in an additional four million grants, an increase of over 800% from the baseline. Full take-up frees nearly 445,000 individuals from poverty, thus reducing the poverty headcount by nearly 2%.

Table 2.18: CSG to age 7 and poverty headcounts

CSG to age 7 with full take-up, using Committee of Inquiry expenditure poverty line no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**463699**	**4887482**	**25326696**	**4026590**	**868.4%**	**91683**	**444566**	**1.9%**	**1.8%**
Western Cape	59407	252428	1317759	210409	354.2%	13615	75413	5.4%	5.7%
Eastern Cape	63038	951191	4755398	769172	1220.2%	6687	29527	0.7%	0.6%
Northern Cape	19734	88744	388319	60684	307.5%	1575	5320	1.8%	1.4%
Free State	18573	356495	1538747	202617	1090.9%	2841	10125	0.8%	0.7%
KwaZulu-Natal	70660	1047001	6074197	1042611	1475.5%	11702	54235	1.1%	0.9%
Northwest	34341	376658	1878601	274279	798.7%	6511	31279	1.7%	1.7%
Gauteng	107493	796871	4028132	574022	534.0%	37137	182037	4.7%	4.5%
Mpumalanga	43704	305035	1656114	250306	572.7%	5645	22685	1.9%	1.4%
Limpopo	46749	713059	3689429	642490	1374.3%	5970	33945	0.8%	0.9%

Source: EPRI Micro-simulation model (with 2000 I&E data)

The poverty impact of the simulation is clearer with the poverty gap measures, which register changes below the poverty line. With the poverty gap measures, the household's poverty gap will be reduced by the exact amount of the grant as long as the household's income does not exceed the poverty line. Table 2.19 below illustrates the impact of the simulation with respect to the average poverty gap. The simulation reduces the median poverty gap from R860 per household per month to R786, a reduction of nearly nine percent. The Western Cape benefits from the greatest percentage reduction, and Limpopo experiences the smallest improvement.

Table 2.19: Full Take-up of the CSG Children 0-7 and the Average Poverty Gap

CSG to age 7 with full take-up, using Committee of Inquiry expenditure poverty line no scales

	Average household rand poverty gap							
	Statistics SA I&E 2000		Micro-simulation model		Rand difference		% change	
	Median	Mean	Median	Mean	Median	Mean	Median	Mean
National	**860**	**1080**	**786**	**999**	**74**	**81**	**8.6%**	**7.5%**
Western Cape	588	755	517	676	76	79	13.0%	10.5%
Eastern Cape	997	1176	920	1096	76	80	7.7%	6.8%
Northern Cape	704	898	642	831	62	67	8.8%	7.5%
Free State	826	967	761	911	65	56	7.8%	5.8%
KwaZulu-Natal	995	1289	919	1190	77	99	7.7%	7.7%
Northwest	803	1038	733	966	70	72	8.7%	6.9%
Gauteng	566	828	512	759	54	69	9.6%	8.3%
Mpumalanga	853	1057	782	976	72	81	8.4%	7.6%
Limpopo	998	1154	937	1065	61	89	6.1%	7.7%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Table 2.20 below illustrates the impact of the simulation on the total rand poverty gap, which aggregates the household poverty gaps. The simulation reduces the aggregate national poverty gap by 4.8 billion rand, a reduction of 7.5%.

Table 2.20: Full Take-up of the CSG (Children 0-7) and the Total Rand Poverty Gap

Total rand poverty gap (R millions)				
	Statistics SA I&E 2000	Micro-simulation	Rand difference	% change
National	**63368**	**58618**	**4750**	**7.5%**
Western Cape	2288	2048	239	10.5%
Eastern Cape	13429	12511	917	6.8%
Northern Cape	956	885	71	7.5%
Free State	4137	3897	241	5.8%
KwaZulu-Natal	16203	14961	1242	7.7%
Northwest	4692	4368	324	6.9%
Gauteng	7917	7262	655	8.3%
Mpumalanga	3869	3574	295	7.6%
Limpopo	9876	9112	764	7.7%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Table 2.21 below illustrates the poverty impact of the CSG simulation at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines (both income and expenditure) have very similar poverty impacts (about a 13% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are much lower (about 7%), since the R394 *per capita* poverty line is significantly higher without the application of economies of scale and adult equivalency scales. Full take-up of the CSG among children aged 0-7 has a considerable impact on destitution, reducing the destitution headcount by 10.9%, and reducing the aggregate poverty gap by 23%. The full results of the simulations are available in the appendix.

Table 2.21 CSG to age 7 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	1.9%	1.8%	0.8%	1.0%	8.6%	7.5%	6.8%	7.0%	7.5%
Comm. of Inquiry expenditure (scales)	5.1%	5.3%	1.8%	2.5%	16.4%	13.4%	13.5%	12.4%	13.4%
Comm. of Inquiry income	1.4%	1.4%	0.7%	0.8%	8.7%	7.4%	7.2%	6.9%	7.4%
Comm. of Inquiry income (scales)	4.2%	4.2%	1.6%	2.1%	15.8%	13.3%	15.1%	12.4%	13.3%
Destitution expenditure (scales)	11.1%	10.9%	2.2%	3.4%	28.2%	23.0%	25.6%	21.4%	23.0%
HSL expenditure	4.8%	5.8%	1.9%	2.7%	13.2%	13.0%	13.0%	11.3%	13.0%
Relative expenditure (scales)	3.8%	3.9%	1.5%	2.0%	12.4%	10.7%	10.6%	9.9%	10.7%

Source: EPRI Micro-simulation model (with 2000 I&E data)

In addition, the CSG simulations were estimated with increases in the real grant levels to 2003 terms (R1606 per year in 2000 currency units). Table 2.22 below illustrates the poverty impact of this CSG simulation at the national level using the different poverty lines in the study. Again, the HSL and the scaled Committee of Inquiry poverty lines (both income and expenditure) have very similar poverty impacts (a 17-18% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are again much lower (about 10%). Full take-up of the higher CSG among children aged 0-7 has a considerable impact on destitution, reducing the destitution headcount by 17.3%, and reducing the aggregate poverty gap by 30.3%. The substantial benefits of the real increase in CSG payments are immediately apparent. The full results of the simulations are available in the appendix.

Table 2.22: CSG(1606) to age 7 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	2.6%	2.3%	1.1%	1.4%	11.3%	10.0%	8.9%	9.3%	10.0%
Comm. of Inquiry expenditure (scales)	7.0%	7.4%	2.4%	3.4%	21.8%	17.6%	18.1%	16.1%	17.6%
Comm. of Inquiry income	1.9%	1.8%	0.9%	1.1%	11.5%	9.8%	10.0%	9.2%	9.8%
Comm. of Inquiry income (scales)	5.6%	5.7%	2.1%	2.8%	22.6%	17.4%	20.9%	16.2%	17.4%
Destitution expenditure (scales)	17.3%	19.6%	3.5%	5.7%	36.8%	30.3%	33.2%	27.1%	30.3%
HSL expenditure	6.5%	8.0%	2.5%	3.7%	18.0%	17.0%	17.3%	14.8%	17.0%
Relative expenditure (scales)	5.0%	5.3%	2.0%	2.8%	16.0%	14.1%	14.1%	13.0%	14.1%

Source: EPRI Micro-simulation model (with 2000 I&E data)

FULL TAKE-UP CSG CHILDREN 0-9

Full take-up of the CSG among eligible children aged 0-9, calculated using the Committee of Inquiry unscaled expenditure poverty line, results in more than five million additional grants, an increase of nearly 1200% from the baseline. Full take-up frees more than 624,000 individuals from poverty (180,000 more than with the CSG from 0-7), thus reducing the poverty headcount by 2.5%.

Table 2.23: CSG to age 9 and poverty headcounts

CSG to age 9 with full take-up, using Committee of Inquiry expenditure poverty line no scales

| | Statistics SA I&E 2000 | | | Micro-simulation model | | | | | |
| | # grant recipients | Poverty Headcount | | # of new grants | | # freed from poverty | | As % of the poor in September 2000 | |
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**463699**	**4887482**	**25326696**	**5413470**	**1167.5%**	**124703**	**624262**	**2.6%**	**2.5%**
Western Cape	59407	252428	1317759	274483	462.0%	15551	87513	6.2%	6.6%
Eastern Cape	63038	951191	4755398	1045120	1657.9%	11160	48705	1.2%	1.0%
Northern Cape	19734	88744	388319	77530	392.9%	2563	8840	2.9%	2.3%
Free State	18573	356495	1538747	278621	1500.1%	4161	18157	1.2%	1.2%
KwaZulu-Natal	70660	1047001	6074197	1403055	1985.6%	15216	73066	1.5%	1.2%
Northwest	34341	376658	1878601	372722	1085.4%	10084	47984	2.7%	2.6%
Gauteng	107493	796871	4028132	755032	702.4%	47156	248945	5.9%	6.2%
Mpumalanga	43704	305035	1656114	346442	792.7%	7401	30952	2.4%	1.9%
Limpopo	46749	713059	3689429	860465	1840.6%	11411	60100	1.6%	1.6%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Table 2.24 below illustrates the poverty impact of the CSG simulation to age 9 at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines (both income and expenditure) again have very similar poverty impacts (a 17-18% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are still much lower (about 10%). Full take-up of the CSG among children aged 0-9 has a considerable impact on destitution, reducing the destitution headcount by 15.6%, and reducing the aggregate poverty gap by 30%. The full results of the simulations are available in the appendix.

Table 2.24: CSG to age 9 with full take-up

| poverty measure: | % poverty headcount reduction | | percentage point poverty rate reduction | | % reduction in avg household rand poverty gap | | % reduction in avg household % poverty gap | | % aggregate poverty gap reduction |
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	2.6%	2.5%	1.1%	1.5%	11.1%	10.1%	9.1%	9.5%	10.1%
Comm. of Inquiry expenditure (scales)	7.3%	7.7%	2.5%	3.6%	21.1%	17.9%	17.5%	16.6%	17.9%
Comm. of Inquiry income	1.9%	1.8%	0.9%	1.1%	11.5%	9.9%	9.9%	9.4%	9.9%
Comm. of Inquiry income (scales)	5.8%	6.0%	2.2%	3.0%	22.4%	17.7%	21.0%	16.6%	17.7%
Destitution expenditure (scales)	15.9%	15.6%	3.2%	4.9%	36.8%	30.3%	34.8%	28.4%	30.3%
HSL expenditure	6.3%	7.6%	2.4%	3.6%	17.9%	17.4%	17.0%	15.2%	17.4%
Relative expenditure (scales)	5.0%	5.2%	2.0%	2.7%	16.8%	14.3%	14.3%	13.3%	14.3%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Again, the CSG simulations were estimated with increases in the real grant levels to 2003 terms. Table 2.25 below illustrates the poverty impact of this CSG simulation at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines have very similar poverty impacts (a 23% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are still much lower (about 13%). Full take-up of the higher CSG among children aged 0-9 has a considerable impact on destitution, reducing the destitution headcount by 25.9%, and reducing the aggregate poverty gap (destitution gap) by 39.2%. Again, the substantial benefits of the real increase in CSG payments are immediately apparent. The full results of the simulations are available in the appendix.

Table 2.25: CSG(1606) to age 9 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	3.5%	3.3%	1.6%	2.0%	14.8%	13.4%	12.3%	12.5%	13.4%
Comm. of Inquiry expenditure (scales)	9.6%	10.2%	3.3%	4.7%	27.1%	23.3%	23.7%	21.5%	23.3%
Comm. of Inquiry income	2.6%	2.5%	1.2%	1.5%	15.7%	13.2%	13.0%	12.4%	13.2%
Comm. of Inquiry income (scales)	8.0%	8.4%	3.0%	4.1%	29.8%	23.1%	28.2%	21.6%	23.1%
Destitution expenditure (scales)	23.1%	25.9%	4.6%	7.5%	49.8%	39.2%	46.1%	35.4%	39.2%
HSL expenditure	8.7%	10.8%	3.4%	5.0%	23.5%	22.8%	22.2%	19.7%	22.8%
Relative expenditure (scales)	6.9%	7.4%	2.8%	3.9%	21.8%	18.9%	18.9%	17.4%	18.9%

Source: EPRI Micro-simulation model (with 2000 I&E data)

FULL TAKE-UP CSG 0-11

Full take-up of the CSG among eligible children aged 0-11, calculated using the Committee of Inquiry unscaled expenditure poverty line, results in nearly an additional seven million grants, an increase of nearly 1500% from the baseline. As seen in the table below, full take-up frees 775,000 individuals from poverty (330,000 more than with the CSG from 0-7), thus reducing the poverty headcount by over 3%.

Table 2.26: CSG to age 11 and poverty headcounts

CSG to age 11 with full take-up, using Committee of Inquiry expenditure poverty line no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**463699**	**4887482**	**25326696**	**6868586**	**1481.3%**	**157449**	**774674**	**3.2%**	**3.1%**
Western Cape	59407	252428	1317759	351636	591.9%	18689	104847	7.4%	8.0%
Eastern Cape	63038	951191	4755398	1350604	2142.5%	15624	66962	1.6%	1.4%
Northern Cape	19734	88744	388319	95993	486.4%	2641	9230	3.0%	2.4%
Free State	18573	356495	1538747	357842	1926.7%	4652	20826	1.3%	1.4%
KwaZulu-Natal	70660	1047001	6074197	1753054	2481.0%	22256	104920	2.1%	1.7%
Northwest	34341	376658	1878601	480447	1399.0%	11024	51920	2.9%	2.8%
Gauteng	107493	796871	4028132	938656	873.2%	56508	291060	7.1%	7.2%
Mpumalanga	43704	305035	1656114	440428	1007.8%	10134	45973	3.3%	2.8%
Limpopo	46749	713059	3689429	1099926	2352.8%	15921	78936	2.2%	2.1%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Table 2.27 below illustrates the poverty impact of the CSG simulation to age 11 at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines (both income and expenditure) again have very similar poverty impacts (about a 22% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are again much lower (about 13%). Full take-up of the CSG among children aged 0-11 again has the greatest impact on destitution, reducing the destitution headcount by 20.3%, and reducing the aggregate poverty gap by 38%. The full results of the simulations are available in the appendix.

Table 2.27: CSG to age 11 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	3.2%	3.1%	1.4%	1.8%	14.1%	12.7%	11.9%	11.9%	12.7%
Comm. of Inquiry expenditure (scales)	9.3%	9.8%	3.2%	4.5%	25.9%	22.4%	22.8%	20.7%	22.4%
Comm. of Inquiry income	2.4%	2.3%	1.1%	1.4%	15.0%	12.6%	12.7%	11.8%	12.6%
Comm. of Inquiry income (scales)	7.5%	7.8%	2.8%	3.8%	29.3%	22.2%	27.2%	20.8%	22.2%
Destitution expenditure (scales)	20.4%	20.3%	4.1%	6.3%	46.5%	37.5%	43.8%	35.0%	37.5%
HSL expenditure	8.3%	10.3%	3.2%	4.8%	22.6%	22.0%	22.0%	19.0%	22.0%
Relative expenditure (scales)	6.3%	6.8%	2.5%	3.5%	21.0%	18.1%	18.4%	16.7%	18.1%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Again, the CSG simulations were estimated with increases in the real grant levels to 2003 terms. Table 2.28 below illustrates the poverty impact of this CSG simulation at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines have very similar poverty impacts (a 29% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are still much lower (about 17%). Full take-up of the higher CSG among children aged 0-11 has a considerable impact on destitution, reducing the destitution headcount by a third, and reducing the aggregate poverty gap (destitution gap) by 46.9%. Each simulation corroborates the substantial benefits of the real increase in CSG payments. The full results of the simulations are available in the appendix.

Table 2.28: CSG(1606) to age 11 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	4.5%	4.2%	2.0%	2.5%	18.9%	16.9%	16.3%	15.8%	16.9%
Comm. of Inquiry expenditure (scales)	12.8%	13.8%	4.4%	6.4%	34.1%	29.1%	31.0%	26.8%	29.1%
Comm. of Inquiry income	3.2%	3.2%	1.5%	1.9%	19.7%	16.7%	17.0%	15.7%	16.7%
Comm. of Inquiry income (scales)	10.3%	10.9%	3.9%	5.4%	38.5%	28.9%	36.4%	26.9%	28.9%
Destitution expenditure (scales)	29.5%	33.4%	5.9%	9.7%	60.4%	46.9%	57.5%	42.3%	46.9%
HSL expenditure	11.7%	14.8%	4.5%	6.9%	29.9%	28.5%	28.6%	24.6%	28.5%
Relative expenditure (scales)	9.0%	9.7%	3.6%	5.0%	27.5%	23.7%	24.2%	21.9%	23.7%

Source: EPRI Micro-simulation model (with 2000 I&E data)

FULL TAKE-UP CSG 0-14

Full take-up of the CSG among eligible children aged 0-14, calculated using the Committee of Inquiry unscaled expenditure poverty line, results in nearly nine million additional grants, an increase of over 1900% from the baseline. Full take-up frees over a million individuals from poverty (589,000 more than with the CSG from 0-7), thus reducing the poverty headcount by over 4%.

Table 2.29: CSG to age 14 and poverty headcounts

CSG to age 14 with full take-up, using Committee of Inquiry expenditure poverty line no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**463699**	**4887482**	**25326696**	**8965245**	**1933.4%**	**210159**	**1033592**	**4.3%**	**4.1%**
Western Cape	59407	252428	1317759	438528	738.2%	23764	132368	9.4%	10.0%
Eastern Cape	63038	951191	4755398	1797836	2852.0%	21290	88073	2.2%	1.9%
Northern Cape	19734	88744	388319	120964	613.0%	2954	10840	3.3%	2.8%
Free State	18573	356495	1538747	471682	2539.6%	8754	42429	2.5%	2.8%
KwaZulu-Natal	70660	1047001	6074197	2266604	3207.8%	29514	141746	2.8%	2.3%
Northwest	34341	376658	1878601	633656	1845.2%	13978	68395	3.7%	3.6%
Gauteng	107493	796871	4028132	1204343	1120.4%	75157	383729	9.4%	9.5%
Mpumalanga	43704	305035	1656114	584338	1337.0%	14104	64878	4.6%	3.9%
Limpopo	46749	713059	3689429	1447294	3095.9%	20644	101134	2.9%	2.7%

Source: EPRI Micro-simulation model (with 2000 I&E data)

EPRI modelled the poverty impact of extending the CSG to children up to 14 years of age using the Committee of Inquiry income poverty line with economies of scale and adult equivalency scales for the analysis. In this simulation, there were roughly 7 million new grant beneficiaries, and the poverty headcount was reduced by 10% at the national level. The reduction in the poverty headcount is largest in the Western Cape, a general trend throughout the simulations.

Table 2.29 compares the poverty impact of the simulation using the poverty lines. Extending the CSG to children up to age 14 and increasing to full take-up has a substantial effect, reducing the destitution headcount by 26.5%, the average poverty gap by 60.5%, and the rand poverty gap by almost half. With the HSL and Committee of Inquiry income poverty line, the poverty headcount reduction was roughly 10%, and the rand poverty gap was reduced by 25%. As suggested by the simulation, the recent extension of the CSG to children up to age 14 has the potential to have a very significant impact on poverty, particularly if take-up rates can be increased above current levels.

Table 2.30 below illustrates the poverty impact of the CSG simulation to age 14 at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines (both income and expenditure) again have very similar poverty impacts (about a 29% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are again much lower (about 17%). Full take-up of the CSG among children aged 0-14 again has the greatest impact on destitution, reducing the destitution headcount by 26.5%, and reducing the aggregate poverty gap by 47.4%. The full results of the simulations are available in the appendix.

Table 2.30: CSG to age 14 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	4.3%	4.1%	1.9%	2.4%	18.5%	16.6%	15.9%	15.5%	16.6%
Comm. of Inquiry expenditure (scales)	12.7%	13.4%	4.4%	6.2%	33.3%	28.8%	30.4%	26.7%	28.8%
Comm. of Inquiry income	3.1%	3.1%	1.4%	1.8%	19.5%	16.4%	16.5%	15.5%	16.4%
Comm. of Inquiry income (scales)	10.2%	10.6%	3.8%	5.2%	36.8%	28.6%	35.5%	26.8%	28.6%
Destitution expenditure (scales)	26.5%	26.5%	5.3%	8.2%	60.5%	47.4%	56.7%	44.4%	47.4%
HSL expenditure	11.3%	14.0%	4.4%	6.5%	29.9%	28.6%	28.0%	24.7%	28.6%
Relative expenditure (scales)	8.4%	9.1%	3.4%	4.7%	27.2%	23.4%	23.7%	21.7%	23.4%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Again, the CSG simulations were estimated with increases in the real grant levels to 2003 terms. Table 2.31 below illustrates the poverty impact of this CSG simulation at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines have very similar poverty impacts (a 37% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are still much lower (about 22%). Full take-up of the higher CSG among children aged 0-14 has a considerable impact on destitution, reducing the destitution headcount by 44%, and reducing the aggregate poverty gap (destitution gap) by 57%. Again, the simulation corroborates the substantial benefits of the real increase in CSG payments. The full results of the simulations are available in the appendix.

Table 2.31: CSG(1606) to age 14 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	5.9%	5.6%	2.6%	3.3%	24.6%	22.0%	21.2%	20.6%	22.0%
Comm. of Inquiry expenditure (scales)	17.8%	19.3%	6.1%	8.9%	44.1%	37.0%	41.1%	34.1%	37.0%
Comm. of Inquiry income	4.2%	4.2%	1.9%	2.5%	25.6%	21.8%	22.2%	20.5%	21.8%
Comm. of Inquiry income (scales)	14.1%	15.1%	5.3%	7.5%	48.9%	36.9%	47.3%	34.3%	36.9%
Destitution expenditure (scales)	38.4%	43.9%	7.7%	12.7%	76.1%	57.0%	73.6%	51.3%	57.0%
HSL expenditure	16.1%	20.2%	6.2%	9.5%	39.5%	36.7%	37.6%	31.6%	36.7%
Relative expenditure (scales)	12.3%	13.2%	4.9%	6.9%	35.1%	30.5%	31.3%	28.2%	30.5%

Source: EPRI Micro-simulation model (with 2000 I&E data)

FULL TAKE-UP CSG 0-16

Full take-up of the CSG among eligible children aged 0-16, calculated using the Committee of Inquiry unscaled expenditure poverty line, results in an additional ten million grants, an increase of over 2200% from the baseline. Full take-up frees over 1.2 million individuals from poverty (769,000 more than with the CSG from 0-7), thus reducing the poverty headcount by nearly 5%.

Table 2.32: CSG to age 16 and poverty headcounts

CSG to age 16 with full take-up, using Committee of Inquiry expenditure poverty line no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**463699**	**4887482**	**25326696**	**10355186**	**2233.2%**	**247015**	**1213609**	**5.1%**	**4.8%**
Western Cape	59407	252428	1317759	507844	854.9%	28688	153664	11.4%	11.7%
Eastern Cape	63038	951191	4755398	2088364	3312.9%	25453	105108	2.7%	2.2%
Northern Cape	19734	88744	388319	137499	696.8%	3514	14036	4.0%	3.6%
Free State	18573	356495	1538747	552399	2974.2%	10374	49453	2.9%	3.2%
KwaZulu-Natal	70660	1047001	6074197	2611822	3696.3%	35422	173261	3.4%	2.9%
Northwest	34341	376658	1878601	734366	2138.5%	16573	81549	4.4%	4.3%
Gauteng	107493	796871	4028132	1361809	1266.9%	83893	431116	10.5%	10.7%
Mpumalanga	43704	305035	1656114	678983	1553.6%	16808	78637	5.5%	4.7%
Limpopo	46749	713059	3689429	1682100	3598.2%	26290	126785	3.7%	3.4%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Table 2.33 below illustrates the poverty impact of the CSG simulation to age 16 at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines (both income and expenditure) again have very similar poverty impacts (about a 33% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are again much lower (about 19%). Full take-up of the CSG among children aged 0-16 again has the

greatest impact on destitution, reducing the destitution headcount by 31.5%, and reducing the aggregate poverty gap by 54%. The full results of the simulations are available in the appendix.

Table 2.33: CSG to age 16 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	5.1%	4.8%	2.2%	2.8%	21.7%	19.1%	18.5%	18.0%	19.1%
Comm. of Inquiry expenditure (scales)	14.9%	15.8%	5.2%	7.3%	38.6%	32.9%	35.8%	30.5%	32.9%
Comm. of Inquiry income	3.7%	3.6%	1.7%	2.2%	23.0%	18.9%	19.1%	17.9%	18.9%
Comm. of Inquiry income (scales)	11.9%	12.4%	4.5%	6.1%	42.6%	32.7%	41.3%	30.7%	32.7%
Destitution expenditure (scales)	31.4%	31.5%	6.3%	9.8%	68.0%	53.5%	65.3%	50.1%	53.5%
HSL expenditure	13.2%	16.4%	5.1%	7.7%	34.4%	32.8%	32.6%	28.3%	32.8%
Relative expenditure (scales)	10.0%	10.7%	4.0%	5.6%	31.8%	26.8%	27.4%	25.0%	26.8%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Again, the CSG simulations were estimated with increases in the real grant levels to 2003 terms. Table 2.34 below illustrates the poverty impact of this CSG simulation at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines have very similar poverty impacts (a 42% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are still much lower (about 25%). Full take-up of the higher CSG among children aged 0-16 has a considerable impact on destitution, reducing the destitution headcount by a half, and reducing the aggregate poverty gap (destitution gap) by 63%. The simulation again corroborates the substantial benefits of the real increase in CSG payments. The full results of the simulations are available in the appendix.

Table 2.34: CSG(1606) to age 16 with full take-up
Source: EPRI Micro-simulation model (with 2000 I&E data)

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	6.9%	6.5%	3.0%	3.8%	28.4%	25.3%	24.6%	23.8%	25.3%
Comm. of Inquiry expenditure (scales)	20.9%	22.7%	7.2%	10.5%	51.2%	42.0%	47.3%	38.8%	42.0%
Comm. of Inquiry income	5.3%	5.3%	2.4%	3.2%	30.0%	25.1%	25.5%	23.7%	25.1%
Comm. of Inquiry income (scales)	16.9%	18.1%	6.4%	8.9%	56.4%	41.9%	55.8%	39.1%	41.9%
Destitution expenditure (scales)	43.8%	50.2%	8.8%	14.6%	87.1%	62.8%	85.5%	56.7%	62.8%
HSL expenditure	18.8%	23.8%	7.3%	11.1%	45.7%	42.0%	44.0%	36.1%	42.0%
Relative expenditure (scales)	14.5%	15.7%	5.8%	8.2%	40.5%	34.8%	37.1%	32.3%	34.8%

FULL TAKE-UP CSG 0-18

Full take-up of the CSG among eligible children aged 0-18, calculated using the Committee of Inquiry unscaled expenditure poverty line, results in nearly twelve million additional grants, an increase of over 2500% from the baseline. Full take-up frees over 1.4 million individuals from poverty (nearly a million more than with the CSG 0-7), thus reducing the poverty headcount by 5.6%.

Table 2.35: CSG to age 18 and poverty headcounts

CSG to age 18 with full take-up, using Committee of Inquiry expenditure poverty line no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**463699**	**4887482**	**25326696**	**11642986**	**2510.9%**	**286573**	**1406082**	**5.9%**	**5.6%**
Western Cape	59407	252428	1317759	566614	953.8%	31007	165480	12.3%	12.6%
Eastern Cape	63038	951191	4755398	2359084	3742.3%	29188	124539	3.1%	2.6%
Northern Cape	19734	88744	388319	152935	775.0%	3704	14416	4.2%	3.7%
Free State	18573	356495	1538747	637130	3430.4%	12322	57084	3.5%	3.7%
KwaZulu-Natal	70660	1047001	6074197	2931599	4148.9%	44504	215853	4.3%	3.6%
Northwest	34341	376658	1878601	817929	2381.8%	20004	97086	5.3%	5.2%
Gauteng	107493	796871	4028132	1511283	1405.9%	91535	472933	11.5%	11.7%
Mpumalanga	43704	305035	1656114	770392	1762.7%	18894	88286	6.2%	5.3%
Limpopo	46749	713059	3689429	1896020	4055.7%	35415	170405	5.0%	4.6%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Table 2.36 below illustrates the poverty impact of the CSG simulation to age 18 at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines (both income and expenditure) again have very similar poverty impacts (a 36-37% reduction in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are again much lower (about 21%). Full take-up of the CSG among children aged 0-18 again has the greatest impact on destitution, reducing the destitution headcount by 35.6%, and reducing the aggregate poverty gap by 58.7%. The full results of the simulations are available in the appendix.

Table 2.36: CSG to age 18 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	5.9%	5.6%	2.6%	3.3%	24.3%	21.4%	20.7%	20.3%	21.4%
Comm. of Inquiry expenditure (scales)	17.4%	18.6%	6.0%	8.6%	43.2%	36.4%	39.6%	33.8%	36.4%
Comm. of Inquiry income	4.3%	4.2%	1.9%	2.5%	25.5%	21.2%	21.3%	20.2%	21.2%
Comm. of Inquiry income (scales)	14.0%	14.4%	5.3%	7.1%	47.5%	36.3%	45.9%	34.0%	36.3%
Destitution expenditure (scales)	35.6%	35.6%	7.1%	11.1%	76.0%	58.7%	73.5%	55.2%	58.7%
HSL expenditure	14.9%	18.4%	5.8%	8.6%	38.3%	36.7%	37.0%	31.6%	36.7%
Relative expenditure (scales)	11.6%	12.4%	4.6%	6.4%	34.3%	29.9%	30.5%	27.9%	29.9%

Source: EPRI Micro-simulation model (with 2000 I&E data)

The final CSG simulation estimated full take-up to age 19 with increases in the real grant levels to 2003 terms. Table 2.37 below illustrates the poverty impact of this CSG simulation at the national level using the different poverty lines in the study. Consistently, the HSL and the scaled Committee of Inquiry poverty lines have very similar poverty impacts (a 46-47% reduction in the aggregate poverty gap in this case), while the figures for the unscaled Committee of Inquiry poverty lines are consistently much lower (28% in this case). Full take-up of the higher CSG among children aged 0-18 has a considerable impact on destitution, reducing the destitution headcount by 56.3%, and reducing the aggregate poverty gap (destitution gap) by 68%. Every CSG simulation has corroborated the substantial benefits of the real increase in the grant payment. The progressive extension of the Child Support Grant to all children yields

substantially improved benefits. The full results of the simulations are available in the appendix.

Table 2.37: CSG(1606) to age 18 with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	8.0%	7.5%	3.5%	4.4%	32.2%	28.3%	27.5%	26.7%	28.3%
Comm. of Inquiry expenditure (scales)	23.7%	25.9%	8.2%	12.0%	56.5%	46.3%	52.7%	42.7%	46.3%
Comm. of Inquiry income	6.2%	6.1%	2.8%	3.7%	33.7%	28.1%	29.3%	26.7%	28.1%
Comm. of Inquiry income (scales)	19.8%	21.0%	7.5%	10.4%	62.4%	46.2%	61.1%	43.0%	46.2%
Destitution expenditure (scales)	48.9%	56.3%	9.8%	16.3%	97.8%	67.9%	97.7%	61.4%	67.9%
HSL expenditure	21.4%	27.2%	8.3%	12.7%	50.8%	46.6%	49.8%	40.1%	46.6%
Relative expenditure (scales)	16.9%	18.2%	6.8%	9.5%	45.0%	38.7%	40.7%	35.9%	38.7%

Source: EPRI Micro-simulation model (with 2000 I&E data)

DISABILITY GRANT

For the disability grant, the simulation designated an individual as eligible for receiving the grant if he or she stated that he or she was too sick to work. Modelled simulations included the effect of a 50% increase in the DG and full take-up of the grant.

In September 2000, there were approximately 439,000 DG grant recipients captured by the Statistics South Africa survey, and another estimated 780,000 eligible individuals who were not currently receiving the grant. Thus, the estimated take-up rate of the DG in September 2000 was roughly 36%, using the broad definition of eligibility that evolved from the terms of reference. In simulating the fifty percent increase in take-up, the model assigned 218,460 new grants, bringing the total number of grant recipients up to 657 thousand beneficiaries. As shown in the table below, using the Committee of Inquiry unscaled expenditure poverty line, the 50% increase in take-up frees over 141 thousand individuals from poverty and reduces the poverty headcount by 0.6%.

Table 2.38: DG with 50% increase in take-up: poverty headcount effects

DG with 50% increase in take-up, using Committee of Inquiry expenditure poverty line with no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**438542**	**4887482**	**25326696**	**218460**	**49.8%**	**39442**	**141426**	**0.8%**	**0.6%**
Western Cape	70442	252428	1317759	13843	19.7%	2471	11016	1.0%	0.8%
Eastern Cape	78664	951191	4755398	46316	58.9%	7550	20794	0.8%	0.4%
Northern Cape	20076	88744	388319	5280	26.3%	1643	5123	1.9%	1.3%
Free State	20069	356495	1538747	15909	79.3%	1574	4096	0.4%	0.3%
KwaZulu-Natal	97038	1047001	6074197	50709	52.3%	10095	36451	1.0%	0.6%
Northwest	34942	376658	1878601	21106	60.4%	4019	12037	1.1%	0.6%
Gauteng	61745	796871	4028132	34265	55.5%	7752	34806	1.0%	0.9%
Mpumalanga	20091	305035	1656114	13276	66.1%	1125	6032	0.4%	0.4%
Limpopo	35475	713059	3689429	17756	50.1%	3213	11071	0.5%	0.3%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Table 2.39 below illustrates the poverty impact of the DG simulation at the national level using the different poverty lines in the study. The HSL, the relative expenditure poverty line and the scaled Committee of Inquiry poverty lines (both income

and expenditure) have fairly similar poverty impacts (2.6% to 3.2% reductions in the aggregate poverty gap), while the figures for the unscaled Committee of Inquiry poverty lines are lower (1.6% and 1.7%), since the R394 *per capita* poverty line is significantly higher without the application of economies of scale and adult equivalency scales. An increase of 50% in the take-up of the DG has a greater impact on destitution, reducing the destitution headcount by 7.4%, and reducing the aggregate poverty gap (destitution gap) by nearly 5%. The full results of the simulations are available in the appendix.

Table 2.39: DG with 50% increase in take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	0.8%	0.6%	0.4%	0.3%	1.9%	1.5%	1.8%	1.7%	1.7%
Comm. of Inquiry expenditure (scales)	1.5%	1.2%	0.5%	0.5%	2.9%	2.6%	2.7%	2.5%	2.8%
Comm. of Inquiry income	0.7%	0.4%	0.3%	0.3%	1.8%	1.4%	1.7%	1.7%	1.6%
Comm. of Inquiry income (scales)	1.1%	0.9%	0.4%	0.4%	4.6%	2.9%	3.7%	2.7%	3.2%
Destitution expenditure (scales)	8.3%	7.4%	0.6%	0.8%	5.2%	4.6%	6.0%	4.4%	4.8%
HSL expenditure	1.5%	1.4%	0.6%	0.7%	2.9%	2.6%	2.7%	2.4%	2.7%
Relative expenditure (scales)	1.1%	0.9%	0.5%	0.5%	3.2%	2.3%	2.2%	2.2%	2.6%

Source: EPRI Micro-simulation model (with 2000 I&E data)

In simulating full take-up, the model assigned every eligible individual a grant, thus bringing the total number of grant recipients up to 1.2 million beneficiaries. As shown in the table below, using the Committee of Inquiry unscaled expenditure poverty line, full take-up frees over 448 thousand individuals from poverty and reduces the poverty headcount by 1.8%.

Table 2.40: DG with full take-up: poverty headcount effects

DG with full take-up, using Committee of Inquiry expenditure poverty line with no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**438542**	**4887482**	**25326696**	**780318**	**177.9%**	**133791**	**448199**	**2.7%**	**1.8%**
Western Cape	70442	252428	1317759	55546	78.9%	10804	44220	4.3%	3.4%
Eastern Cape	78664	951191	4755398	150466	191.3%	28713	78229	3.0%	1.6%
Northern Cape	20076	88744	388319	22818	113.7%	4336	12856	4.9%	3.3%
Free State	20069	356495	1538747	54619	272.2%	7975	24773	2.2%	1.6%
KwaZulu-Natal	97038	1047001	6074197	158093	162.9%	20406	72912	1.9%	1.2%
Northwest	34942	376658	1878601	74196	212.3%	16098	49617	4.3%	2.6%
Gauteng	61745	796871	4028132	136145	220.5%	26701	103387	3.4%	2.6%
Mpumalanga	20091	305035	1656114	52758	262.6%	8711	33735	2.9%	2.0%
Limpopo	35475	713059	3689429	75677	213.3%	10047	28470	1.4%	0.8%

Source: EPRI Micro-simulation model (with 2000 I&E data)

Table 2.41 below illustrates the poverty impact of the full take-up DG simulation at the national level using the different poverty lines in the study. The HSL and the scaled Committee of Inquiry poverty lines (both income and expenditure) again have fairly similar poverty impacts (9.2% to 9.3% reductions in the aggregate poverty gap), the relative expenditure poverty line has a smaller impact (a 7.8% reduction in the aggregate poverty gap), and the figures for the unscaled Committee of Inquiry poverty lines are even lower (5.1%). Full take-up of the DG has its greatest impact on destitution, reducing the destitution headcount by 9.7%, and reducing the aggregate

poverty gap (destitution gap) by 13%. The full results of the simulations are available in the appendix.

Table 2.41: DG with full take-up

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	2.7%	1.8%	1.2%	1.0%	6.5%	5.1%	6.2%	5.7%	5.1%
Comm. of Inquiry expenditure (scales)	5.6%	4.8%	2.0%	2.2%	12.2%	9.3%	10.5%	9.1%	9.3%
Comm. of Inquiry income	2.4%	1.6%	1.1%	1.0%	7.6%	5.1%	6.8%	5.7%	5.1%
Comm. of Inquiry income (scales)	4.8%	3.9%	1.8%	1.9%	13.4%	9.3%	12.1%	9.1%	9.3%
Destitution expenditure (scales)	10.0%	9.7%	2.0%	2.8%	15.2%	13.0%	15.1%	12.3%	13.0%
HSL expenditure	5.6%	5.5%	2.2%	2.6%	11.4%	9.2%	9.8%	8.7%	9.2%
Relative expenditure (scales)	4.1%	3.1%	1.6%	1.6%	10.2%	7.8%	8.3%	7.8%	7.8%

Source: EPRI Micro-simulation model (with 2000 I&E data)

FULL TAKE-UP OF ALL GRANTS

EPRI used the micro-simulation model to quantify the potential impact of full take-up of all the social assistance grants-the DG, the CSG to age 14, and the SOAP. In September 2000, there were approximately 2.7 million grant recipients captured by the Statistics South Africa survey, and another estimated 10.1 million individuals potentially eligible for the SOAP, the CSG or the DG under the terms discussed in this paper. In simulating full take-up of all grants, the model increased the number of grant recipients to 12.8 million beneficiaries. As shown in the table below, using the Committee of Inquiry unscaled expenditure poverty line, full take-up of all grants frees over 1.8 million individuals from poverty and reduces the poverty headcount by 7.3%. The effects are the greatest in the highest income provinces—Gauteng and the Western Cape. The impact is the smallest in one of the poorest provinces—the poverty headcount for individuals in Limpopo is reduced by only 4.3%. The insensitivity of the poverty headcount measure explains this paradoxical result: this measure shows the greatest impact in provinces where the poor have incomes just below the poverty line—that is, in the least poor provinces.

Table 2.42: All grants with full take-up: poverty headcount effects
All grants with full take-up, using Committee of Inquiry expenditure poverty line with no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**2656508**	**4887482**	**25326696**	**10138898**	**381.7%**	**434827**	**1841325**	**8.9%**	**7.3%**
Western Cape	241897	252428	1317759	522160	215.9%	39609	199714	15.7%	15.2%
Eastern Cape	499290	951191	4755398	2023378	405.3%	73155	252040	7.7%	5.3%
Northern Cape	69402	88744	388319	150174	216.4%	8999	30374	10.1%	7.8%
Free State	131645	356495	1538747	547697	416.0%	22513	87549	6.3%	5.7%
KwaZulu-Natal	522017	1047001	6074197	2506403	480.1%	67065	274858	6.4%	4.5%
Northwest	208084	376658	1878601	734696	353.1%	39579	160263	10.5%	8.5%
Gauteng	471943	796871	4028132	1444092	306.0%	118554	565311	14.9%	14.0%
Mpumalanga	161387	305035	1656114	649685	402.6%	25616	111408	8.4%	6.7%
Limpopo	350843	713059	3689429	1560613	444.8%	39737	159808	5.6%	4.3%

Source: EPRI Micro-simulation model (with 2000 I&E data)

The measurement of the impact is more balanced when one uses the total rand poverty gap measure. While Gauteng and the Western Cape still demonstrate two of the largest poverty reductions, the effects in the poorest provinces lag not so far behind.

Limpopo's total rand poverty gap falls by 22.8%, and the poverty gap in the Eastern Cape falls by 23.9%. This compares to the 25.2% reduction in Gauteng and the 27.8% reduction in the Western Cape.

Table 2.43: All grants with full take-up: total rand poverty gap effects
All grants with full take-up, using Comm. of Inq. expenditure poverty line

	Total rand poverty gap (R millions)			
	Statistics SA I&E 2000	Micro-simulation	Rand difference	% change
National	**63368**	**48309**	**15059**	**23.8%**
Western Cape	2288	1651	636	27.8%
Eastern Cape	13429	10226	3203	23.9%
Northern Cape	956	713	243	25.4%
Free State	4137	3262	876	21.2%
KwaZulu-Natal	16203	12502	3701	22.8%
Northwest	4692	3485	1208	25.7%
Gauteng	7917	5921	1996	25.2%
Mpumalanga	3869	2922	948	24.5%
Limpopo	9876	7627	2249	22.8%

Source: EPRI Micro-simulation model (with 2000 I&E data)

A comparison of various poverty reduction indicators demonstrates the differences in how they quantify the social impact of increased grant take-up. The results of the simulation are particularly striking with respect to destitution. Full take-up of all grants reduces the destitution headcount by 45% (for individuals), the median rand poverty gap by 81%, and the total rand poverty gap by 59%. The extent of poverty reduction depends in large part on how you measure the impact. Likewise, the differences in methodology between the HSL and the Committee of Inquiry unscaled income poverty line are striking—the HSL poverty headcount reduction is nearly three times that calculated using this *Committee of Inquiry* poverty line. Yet, using the median rand poverty gap measure, the HSL reduction is only fifty percent greater than this *Committee of Inquiry* poverty line. A balanced analysis of social security reform requires familiarity with the methodological differences distinguishing alternative poverty lines and impact indicators.

Table 2.44: All grants with full take-up: comparison of indicators

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	8.9%	7.3%	4.0%	4.3%	28.2%	23.8%	24.8%	23.6%	23.8%
Comm. of Inquiry expenditure (scales)	21.8%	21.8%	7.5%	10.1%	49.6%	40.0%	45.9%	37.7%	40.0%
Comm. of Inquiry income	7.1%	5.8%	3.2%	3.5%	29.5%	23.6%	26.6%	23.5%	23.6%
Comm. of Inquiry income (scales)	18.4%	18.2%	7.0%	9.0%	56.9%	39.9%	54.8%	37.9%	39.9%
Destitution expenditure (scales)	41.6%	45.4%	8.3%	13.2%	80.9%	58.6%	79.4%	54.0%	58.6%
HSL expenditure	20.2%	23.4%	7.8%	11.0%	44.8%	39.4%	42.2%	35.1%	39.4%
Relative expenditure (scales)	15.5%	15.2%	6.2%	7.9%	40.2%	33.5%	36.7%	31.8%	33.5%

Source: EPRI Micro-simulation model (with 2000 I&E data)

EPRI also used the micro-simulation model to quantify the potential impact of full take-up of all the social assistance grants with the real value of the CSG payment raised to its 2003 levels. This does not change the number of grant recipients, but the measured social impact is significantly greater. As shown in the table below, using the Committee of Inquiry unscaled expenditure poverty line, full take-up of all grants (including the CSG with the higher payment) frees 2.3 million individuals from poverty (compared to only 1.8 million individuals with the lower CSG payment) and reduces the poverty headcount by 9% (compared to 7.3% with the lower CSG payment). As in the previous analysis, the effects are the greatest in the highest income provinces—Gauteng and the Western Cape, and again the impact is the smallest in one of the poorest provinces—the poverty headcount for individuals in Limpopo is reduced by only 5.6%.

Table 2.45: All grants(1606) with full take-up: poverty headcount effects

All grants(1606) with full take-up, using Committee of Inquiry expenditure poverty line with no scales

	Statistics SA I&E 2000			Micro-simulation model					
	# grant recipients	Poverty Headcount		# of new grants		# freed from poverty		As % of the poor in September 2000	
		households	individuals	# of new grants	% change since 2000	households	individuals	households	individuals
National	**2656508**	**4887482**	**25326696**	**10138898**	**381.7%**	**524784**	**2291425**	**10.7%**	**9.0%**
Western Cape	241897	252428	1317759	522160	215.9%	46410	235070	18.4%	17.8%
Eastern Cape	499290	951191	4755398	2023378	405.3%	82829	307264	8.7%	6.5%
Northern Cape	69402	88744	388319	150174	216.4%	10191	35046	11.5%	9.0%
Free State	131645	356495	1538747	547697	416.0%	25180	98334	7.1%	6.4%
KwaZulu-Natal	522017	1047001	6074197	2506403	480.1%	91080	397156	8.7%	6.5%
Northwest	208084	376658	1878601	734696	353.1%	47413	196001	12.6%	10.4%
Gauteng	471943	796871	4028132	1444092	306.0%	138647	662610	17.4%	16.4%
Mpumalanga	161387	305035	1656114	649685	402.6%	34361	152967	11.3%	9.2%
Limpopo	350843	713059	3689429	1560613	444.8%	48673	206977	6.8%	5.6%

Source: EPRI Micro-simulation model (with 2000 I&E data)

A comparison of various poverty reduction indicators, as in the table below, demonstrates the same kind of differences in terms of how they quantify the social impact of increased grant take-up, as discussed above. Full take-up of all grants reduces the destitution headcount by 55% (for individuals, compared to only 45% with the lower CSG payment), the median rand poverty gap by 99% (compared to only 81% with the lower CSG payment), and the total rand poverty gap by 67% (compared to 59% with the lower CSG payment). The comparisons affirm the value of the increased CSG grant payment in terms of its substantial poverty-reducing impact and underscore the importance of understanding the methodological differences distinguishing alternative poverty lines and impact indicators.

Table 2.46: All grants(1606) with full take-up: comparison of indicators

poverty measure:	% poverty headcount reduction		percentage point poverty rate reduction		% reduction in avg household rand poverty gap		% reduction in avg household % poverty gap		% aggregate poverty gap reduction
POVERTY LINE:	HH	ind	HH	ind	median	mean	median	mean	
Comm. of Inquiry expenditure	10.7%	9.0%	4.8%	5.4%	34.1%	29.0%	30.4%	28.4%	29.0%
Comm. of Inquiry expenditure (scales)	26.9%	27.9%	9.3%	12.9%	59.8%	47.5%	55.5%	44.4%	47.5%
Comm. of Inquiry income	8.4%	7.1%	3.8%	4.3%	35.8%	28.9%	32.3%	28.4%	28.9%
Comm. of Inquiry income (scales)	22.6%	23.1%	8.5%	11.4%	68.1%	47.4%	66.2%	44.7%	47.4%
Destitution expenditure (scales)	49.4%	55.2%	9.9%	16.0%	98.8%	66.6%	98.6%	61.1%	66.6%
HSL expenditure	25.2%	30.0%	9.7%	14.0%	54.0%	46.7%	51.9%	41.3%	46.7%
Relative expenditure (scales)	19.5%	19.7%	7.8%	10.3%	48.2%	40.1%	44.0%	37.8%	40.1%

Source: EPRI Micro-simulation model (with 2000 I&E data)

2.6) SUMMARY AND CONCLUSIONS

South Africa's system of social security successfully reduces poverty, regardless of which methodology is used to quantify the impact measure or identify the poverty line. Nevertheless, the quantitative measure of poverty reduction is sensitive to the methodological choices. For instance, the measured impact is consistently greatest when employing the total rand poverty gap as an indicator. The poverty headcount measure, however, consistently yields the smallest results. Likewise, the choice of poverty line heavily influences the measurement of the quantitative impact. The current social security system is most successful when measured against destitution, and the impact is smallest when poverty lines ignore economies of scale and adult equivalence issues. For instance, South Africa's social grants reduce the poverty headcount measure by 4.3%, as measured against the Committee of Inquiry's expenditure poverty line (with no scales). The social security system, however, reduces 45% of the total rand destitution gap—an impact more than ten times greater.

The table below compares the eleven social security reform scenarios (plus the additional seven variants involving the higher CSG payment), showing the differences in the seven poverty lines as measured by the reduction in the total rand poverty gap. Using the Committee of Inquiry expenditure poverty line (without scales), the table below documents the relatively small impact of improving take-up of the State Old Age Pension. A 10% increase in take-up reduces the poverty gap by only 1.2%, and full take-up by only 2.5%. The take-up rate for the SOAP is already very high, and many of the eligible elderly not already receiving the SOAP are not among the poorest South Africans. As a result, further extensions of the SOAP have limited potential in reducing poverty. Extensions of the Disability Grant offer greater promise, although at substantially greater expense. A 50% increase in DG take-up reduces the total rand poverty gap by 1.7%, and full take-up generates a 5.1% reduction. The greatest poverty reducing potential lies with the progressive extension of the Child Support Grant. Extending the eligibility age to 14 reduces the poverty gap by 16.6%, and a further extension to age 18 reduces the gap by 21.4%. Increasing the real grant payment (as the government did in 2003) generates an even greater impact. The extension to age 14 yields a 22% poverty gap reduction, while the extension to age 18 reduces the poverty gap by 28.3%. Combining the higher CSG extended to age 14 with the full take-up of the SOAP and the DG yields a reduction in the total rand poverty gap of 29%.

Table 2.47: Summary of EPRI Micro-simulation results

	Comm. of Inquiry expenditure	Comm. of Inquiry expenditure (scales)	Comm. of Inquiry income	Comm. of Inquiry income (scales)	Destitution expenditure (scales)	HSL expenditure	Relative expenditure (scales)
SOAP with 10% increase in take-up	1.2	2.3	1.3	2.3	3.2	2.2	1.9
SOAP with full take-up	2.5	4.5	2.5	4.5	6.2	4.3	3.8
DG with 50% increase in take-up	1.7	2.8	1.6	3.2	4.8	2.7	2.6
DG with full take-up	5.1	9.3	5.1	9.3	13.0	9.2	7.8
CSG to age 7 with full take-up	7.5	13.4	7.4	13.3	23.0	13.0	10.7
CSG to age 9 with full take-up	10.1	17.9	9.9	17.7	30.3	17.4	14.3
CSG to age 11 with full take-up	12.7	22.4	12.6	22.2	37.5	22.0	18.1
CSG to age 14 with full take-up	16.6	28.8	16.4	28.6	47.4	28.6	23.4
CSG to age 16 with full take-up	19.1	32.9	18.9	32.7	53.5	32.8	26.8
CSG to age 18 with full take-up	21.4	36.4	21.2	36.3	58.7	36.7	29.9
CSG(1606) to age 7 with full take-up	10.0	17.6	9.8	17.4	30.3	17.0	14.1
CSG(1606) to age 9 with full take-up	13.4	23.3	13.2	23.1	39.2	22.8	18.9
CSG(1606) to age 11 with full take-up	16.9	29.1	16.7	28.9	46.9	28.5	23.7
CSG(1606) to age 14 with full take-up	22.0	37.0	21.8	36.9	57.0	36.7	30.5
CSG(1606) to age 16 with full take-up	25.3	42.0	25.1	41.9	62.8	42.0	34.8
CSG(1606) to age 18 with full take-up	28.3	46.3	28.1	46.2	67.9	46.6	38.7
All grants with full take-up	23.8	40.0	23.6	39.9	58.6	39.4	33.5
All grants(1606) with full take-up	29.0	47.5	28.9	47.4	66.6	46.7	40.1

Source: EPRI Micro-simulation model (with 2000 I&E data)

The magnitudes of these effects, of course, depend critically on the poverty line by which the impacts of the reforms are measured. For instance, the 29% reduction in the total rand poverty gap measured using the unscaled Committee of Inquiry expenditure poverty line is less than half the magnitude of the reduction in destitution, which amounts to a 66.6% reduction. Likewise, the impacts of the scaled Committee of Inquiry income and expenditure poverty lines are substantially greater than for the unscaled poverty lines. The impact of the "all grants" package measured with the scaled Committee of Inquiry income poverty line reflects a 47.4% reduction, and with the expenditure poverty line, a comparable 47.5% reduction. As this makes apparent, the distinction between income and expenditure poverty has not generated material differences in this analysis. Likewise, the impact using the unscaled Committee of Inquiry income poverty line (a 28.9% reduction) is virtually the same as that using the unscaled Committee of Inquiry expenditure poverty line (a 29.0% reduction). For almost every simulation, the HSL poverty line generates very close results to those yielded by the scaled Committee of Inquiry income and expenditure poverty lines, in spite of the substantial methodological differences distinguishing the HSL measure. The relative poverty line yields results that are not closely comparable to any of the other poverty line measures, with the results generally falling in between the results of the Committee of Inquiry scaled and unscaled poverty line measures.

The evidence in this chapter documents the substantial impact of South Africa's social security system in reducing poverty and destitution. The magnitudes of the results are sensitive to methodological issues. It matters whether the poverty line is

relative or absolute, whether it is scaled for household composition and economies of scale or not, and to a small extent whether it measures income or expenditure. Likewise, it matters how the poverty impact is measured—using poverty headcount or variants on the poverty gap. Nevertheless, the qualitative results, and the answers to critical policy questions, are robust to different methodological approaches. South Africa's system of social security substantially reduces deprivation, and the progressive extension of the magnitude, scope and reach of social grants holds the potential to dramatically diminish the prevalence of poverty in South Africa.

CHAPTER 3)

The Household Impact of Social Assistance Programmes

3.1) INTRODUCTION

This chapter evaluates the impact of South Africa's social development grants on the well being of individuals and households, evaluating how social security affects household behaviour and access to basic needs, including education, health care, nutrition and other requirements. The previous chapter focused on aggregate household income and expenditure—some of the most common variables used in the measurement of poverty. This chapter broadens the focus, examining dis-aggregated as well as non-monetary measures of well being. The chapter focuses on the main social grants, with a particular emphasis on the State Old Age Pension (SOAP), the Child Support Grant (CSG) and the Disability Grant (DG). Targeted social programmes that provide cash transfers to the poor often have consequences for the behaviour of untargeted individuals due to income sharing within households. Because of income pooling within households, these grants have broad household impacts. This study quantifies these effects, using a linked data set of Statistic South Africa's *Income and Expenditure Survey* (IES) in October 2000 and *Labour Force Survey* (LFS) in September 2000, as well as previous *October Household Surveys*.

3.2) BACKGROUND AND LITERATURE REVIEW

Non-contributory pension programmes have been adopted in several countries in Latin America and Africa, including Brazil, Argentina, Namibia, Botswana, and South Africa. In a study that reviews research on the pension programmes in these countries, Barrientos and Lloyd-Sherlock[10] report the overall positive impacts on poverty. Extreme poverty is 16% lower in households with pension income than in those without pension income in Argentina. Headcount poverty among households with pensioners is significantly lower than those without in Brazil. In Namibia, access to a pension is associated with out-migration from rural areas, suggesting that young adults migrate to cities to look for jobs. Consistent with the finding in South Africa that pensions provided to women have greater impacts on the welfare of the household, one study in Brazil reports that there is a strong association between the presence of female pensioners and school enrolment of girls aged between 12 and 14. These international studies indicate that non-contributory pension programmes in developing countries play important roles in improving social welfare of the poor households.

The effectiveness of South Africa's SOAP in reaching poor households and improving their welfare has also been widely recognised. The non-contributory pension programme was initially intended to provide a social safety net for the aged poor, who were vulnerable in the household because of "a decline in job opportunities, increased vulnerability to health conditions, limited mobility, discrimination in access to credit and

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[10] Barrientos, and Lloyd-Sherlock (2002).

financial markets, and changes in household composition and status" (Barrientos and Lloyd-Sherlock, 5). However, the benefits of the pension are found to be distributed more broadly to all members in the household because the majority of the poor households in South Africa live in multi-generation households.

Economic research usually measures the welfare of the household using income levels, expenditure patterns, health conditions, and education access. However, there exists considerable debate about how to most accurately measure the true well being of a household or an individual. Case and Deaton[11] address the question of appropriate poverty measures for individual members in the household. They are specifically concerned with the differences in male and female individuals within the household, as standard income poverty measures regard all members of the household under a specified income level as "poor." They conclude that health and education are better measures of individual welfare (or poverty) than income and expenditures, because the survey questions in these two categories are usually targeted to individuals rather than to household heads.

Precise and useful measures of education and health, however, are difficult to obtain. For example, while subjective measures, such as years of education and literacy, can quantify some dimensions of education, there is no easily quantified measure of school quality in South Africa. Appropriate measures for health are also difficult to identify. One important methodology for children's health and nutrition employs anthropometric indicators, such as height-for-age and weight-for-height. Using the child anthropometric indicators, Duflo finds that the household with an eligible woman for SOAP increases the weight-for-height of girls significantly, while there was no effect on boys and in the household with an eligible man (Duflo, 2000). Her findings are relevant to the present study: household characteristics are similar between the household with an eligible man and with an eligible woman. This supports the comparison of the impact of the presence of female and male pensioners in the household, given Duflo's evidence suggesting that there are no significant unobservable differences in household characteristics between the two groups. She also points out that the unobserved correlation between SOAP and other public transfers, such as the CSG, may overestimate the impact of SOAP. In order to isolate the impact of the SOAP, it is important to control for other social development grants that households are receiving. In the data sets from 2000 employed by this present study, however, the take up rates for other social grants are very low. As a result, this chapter evaluates household impacts controlling for the CSG and the DG (received by 2.9% and 3.4% of all households respectively), because the other grants are received by less than 1% of the sample.

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[11] Case and Deaton (2002).

Psacharopoulos (1994) concludes that primary schooling remains 'the number one investment priority' for developing countries, with the social rate of return to investment in primary education averaging 24 percent in Sub-Saharan Africa and roughly 20 percent in Asia and Latin America."[12] For many poor children in South Africa, the prospects of education are severely hampered by conditions of poverty. Many poor households cannot afford to invest their limited income into education. In South Africa, "although the current constitution of the Republic of South Africa (adopted in 1996) guarantees education as a right, it is not free. In addition to the direct cost of school fees (tuition), students and their families must cover the indirect costs of books and supplies, school uniforms, and often transportation to school as well. Poorer families who are disproportionately represented among [blacks] (Klasen 1997), are less able to afford the costs of education."[13] The amount that a school may charge for tuition can vary immensely. The fee may be "as little as 50 rand to 6,000 rand and above, depending in part on the quality of the school."[14]

There exists a relationship between education and poverty. "Poverty, pervasive across the region [of Africa], is a barrier to expanding education access and improving learning outcomes."[15] "Of the 35 countries the *United Nations Development Programme* (UNDP) classifies as having low human development, 28 are in Sub-Saharan African (UNDP 1999). More than 40 percent of Africans live below the $1 a day poverty line, and the incidence of poverty as well as the absolute numbers of people living in poverty have increased since the late 1980s."[16] Investments in education by governments and households are hindered by the vast amounts of poverty, resulting in low educational attainment.[17]

"When households become impoverished, older children are often pulled out of school to supplement family income and pay for the school fees of younger siblings."[18] Overall enrolment rates are drastically lower for the poor at all levels. This is particularly true at the secondary level.[19] In addition, even if those who are poor remain in school, these children often spend more time contributing to the household income than those children from better off households. "As a result they are less likely to spend out-of-school hours on schoolwork, more likely to be absent from school during periods of peak labour demand, and more likely to be tired and ill-prepared for learning when they are in the classroom."[20]

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[12] Case (2001).
[13] Anderson (2001).
[14] Anderson (2001).
[15] World Bank (2001).
[16] World Bank (2001).
[17] World Bank (2001).
[18] UNICEF (2001).
[19] Catro *et al.* (1999).
[20] World Bank (2001).

While poverty reduces the ability of children to attend school, education increases the ability of people to move out of poverty. "Poverty is a key obstacle to expanding access to education and improving learning outcomes in Africa, while education is instrumental in eliminating poverty."[21] It is instrumental in reducing poverty because "education develops intellectual capacity and social skills, and children who complete at least four years of schooling- considered the minimum for achieving basic literacy and numeracy- are better equipped to move out of poverty. For example, levels of education correlate with income levels and with the ability to hold a job in the formal sector." [22]

Those children that do not attend school are almost always poor, from disadvantaged groups, and are often in remote areas. "Nearly 60 percent of out-of-school children in Africa are girls."[23] Educating children, particularly girls is key to combating poverty. "Educated girls have greater confidence to make decisions for themselves. They marry later in life and are more likely to space out their pregnancies. As a result, they tend to have fewer children and are more likely to seek medical attention for themselves and their children. They are better informed about good nutrition and childcare. Women who were educated as girls are far more likely to enrol their own children in primary school. Educating children, particularly girls, is therefore a critical part of breaking the inter-generational cycle of poverty."[24] In South Africa, the fraction of children living with a pensioner is highest among children whose household *per capita* incomes are the lowest, so that the pension not only reaches the households in which the children live, but disproportionately reaches children in poverty."[25] The money reaching impoverished children augments the pool that pays for their school fees.

Case studies the impacts of SOAP on health status, comparing households where income is pooled with those where income is not pooled (Case, 2001). She uses height-for-weight and self-reported health conditions as measures of health for children and adults respectively. Although self-reporting is often considered an inconsistent measure, Case and Deaton (2002) show that it is genuinely useful. Their result was intuitive: health status in the household with income pooling improves for all members while health status in the household without income pooling improves the most for the pensioners.

On the subject of expenditure patterns, there are two opposing studies on the impacts of SOAP, which are useful to review for this study. The study by Case and

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[21] World Bank (2001).
[22] UNICEF (2001).
[23] World Bank (2001).
[24] UNICEF(2001).
[25] Case and Deaton (1996).

Deaton (1998)[26] reports that the SOAP is well targeted to the poorest households and households with children. Their results show that the expenditure share of pension income on food is not significantly different from that of non-pension income. This finding supports the hypothesis of income pooling, represented in their words as the idea of "a rand is a rand." More recently, Maitra and Ray (2003) find social grant impacts on expenditure patterns that contradict Case and Deaton's earlier findings that the expenditure allocation of pension income is strikingly similar to that of other income. While Maitra and Ray emphasise the importance of public and private transfers in reducing poverty, they also find that poor households have a fundamentally different expenditure pattern compared to non-poor households, and that expenditure patterns significantly differ with the source of income.

Maitra and Ray's finding of the endogeneity of income flows[27] (regular income, pension income and private transfers) raises an important question for this study. They analyse the relationship between different income and expenditure shares. Their results show that the households that receive private transfers and those that receive public pensions both have higher expenditure shares on food and education, and lower expenditure shares on alcohol, tobacco and entertainment than other households do. This suggests that an increase in pension income or other social grants may have opposite effects on certain expenditure shares, compared to an increase in earned income. An increase in regular income generally decreases the expenditure share on food and increases the share spent on entertainment. They explain these different patterns of expenditures as evidence of non-income pooling: who receives the transfer within the household matters. In the case of the SOAP, it is likely that elderly pensioners allocate the resources differently compared to the household heads that are often of working age. They also find that the amount of pension is positively correlated with the number of the eligible members and negatively correlated with the number of children and adults. These findings inform this present study, which constructs a model to control for the endogeneity of income in order to evaluate the impacts of pension amounts as well as the influence of the demographic composition of the household.

The literature surveyed documents the importance of using a variety of welfare measures to evaluate the impacts of social grants. The present study employs the household school attendance rate as an education measure, the access to piped water and expenditure shares on medical care for non-aid members as health measures, and expenditure shares on food and the prevalence of adult and child hunger as measures of nutrition.

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[26] Case and Deaton (1998).
[27] Endogeneity of income flows refers to Maitra and Ray's finding that the amount of income from one source is one of the determinants of the other types of incomes.

Empirical studies demonstrate the powerful impact of the SOAP as an instrument of poverty reduction. However, most of the studies have been conducted with data collected in 1995 or earlier. As the take-up rates for social grants have increased dramatically in the past several years, more current data has the potential to illuminate a better understanding of the household impact of social development. This present study employs the *Income and Expenditure Survey* from 2000 and the *Labour Force Survey*s from 2000, 2001 and 2002, all conducted by Statistics South Africa. This is the most current nationally representative survey data available at the time of the study.

3.3) SOCIAL SECURITY AND EDUCATION

Economic theory suggests that social grants, by raising incomes, affect education in three ways. First, to the extent that there are financial barriers to school attendance – purchasing school supplies, uniforms, tuition, transportation, etc. – the boost in disposable income provided by a social grant could help pay the otherwise unaffordable costs of attending school. Second, a grant could relieve the opportunity cost of school attendance; with a cash transfer in hand, a family might be more able to forgo a child's contribution to household income (or food production in the case of subsistence farmers) in favour of making a long-term investment in education. Third, by indirectly increasing the resources available to schools, the quality of education may improve, making education a more attractive option to households. This chapter quantifies these effects using econometric models that evaluate the correlation between measures of social grants and school attendance.

METHODOLOGY

The education analysis in this study employs two methodologies—one that develops a three-stage model to control for the simultaneous interactions between social grants and income, and the second that explicitly controls for missing data through strong restrictions on the sample. The first methodology Statistics South Africa's *Income and Expenditure Survey* from October 2000 and the *Labour Force Survey*s from September 2000. The second methodology uses previous *October Household Surveys* by Statistics South Africa.

The first methodology is based on a household expenditure model similar to that of Maitra and Ray's[28] study of expenditure shares. In their study, Maitra and Ray use predicted income, pension income, and private transfers to isolate the effects of three income flows. As their findings show that sources of income affect expenditure patterns of the household, this present study categorises income into household pension income, household remittances, and other household income *per capita* to isolate the impacts of the social grants. Although the use of household total income and household income *per capita* produce significantly similar results, this present study uses household income *per capita* instead of household total income, as the number of people in the household varies from 1 to 25 in the sample. Given this variance, household income

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[28] Maitra and Ray (2003).

per capita reflects well being of the household members better than the total household income.

The model is a three-stage process. First, the model predicts household income *per capita*, based on actual income and other variables that quantify household characteristics. The specifications for the income prediction follow closely to those of Maitra and Ray's[29]. Because income is not necessarily a linear function, the model employs linear non-linear estimation techniques, including log and quadratic specifications. In the second stage, the model predicts the pension amount, using the predicted income *per capita* and other household characteristics. This second stage addresses the issue of the simultaneity of income and pension, as explained by education as well as health, and nutrition variables. For instance, the education and health status of the household may determine both the household income and pension, while income and pensions in turn determine education and health status. By using income and pension variables predicted by other household characteristics, this model corrects for the possible simultaneity and resulting measurement errors.

In the third stage, the impacts of the social grants on household welfare are measured, using predicted income *per capita*, predicted pension amount, remittances, as well as other variables that are important determinants of household welfare. The main education measure—the school attendance rate—is calculated by taking the ratio of the number of children currently enrolled in school to the number of children between seven and sixteen years of age in the household.

There are several concerns with the data. The empirical analysis is based on the merged data set of the IES and LFS, resulting in mismatching issues. For example, some households reported receiving the SOAP in the LFS nevertheless report zero income in this category in the IES. The counts of these mismatches for some variables are as high as 10% of the sample. To evaluate the impact of the possible measurement errors on the robustness of the results, the model tested alternative hierarchies for resolving data inconsistencies and found no significant impacts on the results.

In order to control for missing data, the second part of this section uses a methodology adopted by Bertrand, Miller and Mullainathan (2000) and focuses on the enrolment of children aged 6 to 18 living in three-generational households.[30] [31] By focusing on school age children living in households with both parents and grandparents, the study addresses the possibility that children who live with parents and grandparents in a single household differ systematically from their peers who live only with grandparents with respect to school attendance. Focusing on three-generational households thus reduces heterogeneity in the test sample, essentially controlling for

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[29] See Appendix for regression results for income and pension amount.

[30] Three-generational households contain children, working age adults, and adults in pensionable age.

[31] South African children begin the 1st grade at age 7 and receive their matric at the age of 17. This study expands the age range to account for the usual group of early- or late-starters present in every school system.

missing data—measures of this unobserved heterogeneity. In line with the methodology of Bertrand, Miller and Mullainathan (2000), the results reported in this section are further restricted to those households classified as African by Statistics South Africa.

Three-generational households are quite common in South Africa. Approximately a quarter of the households in the country contain three generations, and a large proportion of these three-generational households receiving some pension disbursement. These characteristics are consistent with findings by Case and Deaton in their analysis of the 1994 *Southern Africa Labour and Development Research Unit* (SALDRU) survey.

The dependent variables in the direct models are binary variables indicating full-time attendance at a school, college, technikon (technical school), or university. Three variables assess the impact of social grant transfers, that is, a level measure of monthly grant receipts, a discrete variable equal to one if households receive some pension transfer, and another discrete variable equal to one if any member of the household is eligible to receive a pension. As Bertrand *et al.* (2000) note, using discrete variables for household eligibility can help to account for potential endogeneity in take-up rates, the possibility that factors in the model (like the education of the household head) are determinants of pension take-up.

A key aspect of the analysis is the significance of poverty in the relationship between school enrolment and social grants. There is little reason to expect that the impact of pensions will be the same for upper income households as for lower income households; because it represents a greater relative increase in disposable income, an additional rand of social grant benefits is expected to have a stronger influence on the behaviour of lower income households. To investigate these effects the model is applied to consumption quartile sub-samples of the population as determined by *per capita* household expenditure. Another important aspect is the testing of differential gender effects of pension transfers on schooling. An interaction term in the specification provides insight into this question.

EDUCATION ANALYSIS USING THE INCOME & EXPENDITURE SURVEY 2000 AND THE LABOUR FORCE SURVEY SEP. 2000 (EXPENDITURE MODEL)

The first model uses the three-stage analysis of income along with other household variables to evaluate the impact of social grants on school attendance. Table 2 summarises the impacts of social grants on the school attendance rate. Using the Ordinary Least Squares (OLS) model, both the State Old Age Pension and the Child Support Grant are positively and significantly related to school attendance rates. The Three-Stage Least Squares (3SLS) model controls for the simultaneity, and yields virtually the same results. The second specification of the 3SLS separates the effect of the gender of the SOAP recipient. The number of female pensioners and the presence of a female household head are both associated with significantly higher school attendance rates. Control variables included in the regression models indicate effects

predicted by economic theory: higher income, greater remittances, and better educated adults in the household are all significantly associated with higher school attendance rates.

In quantitative terms, the effects of social grants can be expressed in terms of the increase in the school attendance rate by children, or inversely by the reduction in the school non-attendance rate. The school attendance rate for children and youth in this sample (calculated on a household basis) averages 94%, equivalent to a non-attendance gap of six percentage points. The first two models detailed in the table below evaluate the impact of the State Old Age Pension in terms of the rand value of the pension received by all eligible members of the household. Receipt of a State Old Age Pension is associated with a reduction of approximately twenty to twenty-five percent in the school non-attendance gap. Likewise, a household's receipt of a Child Support Grant is associated with a reduction of approximately twenty-five percent in the school non-attendance rate.   The impact of the Disability Grant is not significantly different from zero. The third model demonstrates that the impact of the State Old Age Pension depends importantly on the gender of the recipient. Receipt of a State Old Age Pension by a female is associated with a reduction of approximately one-third of the school non-attendance gap. Receipt by a male, however, has no statistically significant impact.

Other socio-economic variables are significantly important in explaining school attendance.   The variable measuring years of education of the household head is statistically the most significant factor in the model, and one year of education has twice the impact of the State Old Age Pension.   Likewise, household income is significantly correlated with school attendance-—he more income available to the household, the greater the likelihood children attend school.   Non-grant income, however, has significantly less of an impact on school attendance than social grant income. This is consistent with the hypothesis that recipients of social grants have different spending priorities relative to recipients of non-grant income—and that those receiving social grants place a greater emphasis on school attendance. Poverty and household income interact in a non-linear way affecting school attendance. Controlling in a linear manner for household income, poverty continues to have a significant negative impact on school attendance.

The demographics of the household also exert an important impact on school attendance. Children in households headed by women are significantly more likely to attend school. Likewise, the presence of elderly household members is associated with higher rates of school attendance, controlling for the separate effect of pension receipt. Geographic variables do not demonstrate the expected statistical significance.   For instance, the variable identifying rural versus urban households is not statistically significant.   Likewise, most of the provincial binary variables are not statistically significant.

Table 3.1: I&E2000/LFS2000 School attendance models

Variable explaining school attendance	OLS MODEL		3SLS MODEL		3SLS MODEL'	
	marginal impact	significance level	marginal impact	significance level	marginal impact	significance level
Actual SOAP amount received by household	0.00210	0.002				
Second stage predicted SOAP amount			0.00239	0.007		
Number of female pensioners					0.02219	0.013
Number of male pensioners					-0.00691	0.464
Receives Child Support Grant	0.01540	0.099	0.01578	0.090	0.01635	0.081
Receives Disability Grant	-0.00945	0.324	-0.01060	0.268	-0.01054	0.274
Actual reported per capita income	0.00030	0.007				
First stage predicted per capita income			0.00143	0.000		
Log of household income per capita					0.04353	0.000
Remittances received by household	0.00148	0.010	0.00161	0.005	-0.00022	0.850
(Remittances received by household) Squared	0.00000	0.093	0.00000	0.066	0.00000	0.130
Household head years of education	0.00487	0.000	0.00459	0.000	0.00387	0.019
(Household head years of education) Squared					-0.00014	0.348
Number of children	0.00011	0.929	0.00094	0.458	0.01180	0.000
Number of adults not eligible for SOAP	0.00250	0.071	0.00232	0.094	0.00365	0.015
Number of elderly					0.01331	0.047
Age of the household head	0.00025	0.005	0.00038	0.003	0.00127	0.000
(Age of the household head) Squared					0.00000	0.000
Female household head	0.01032	0.013	0.01262	0.003	0.02763	0.000
White	0.01081	0.286	-0.01400	0.297		
Black					0.06154	0.000
Coloured					0.01830	0.188
Indian/Asian					0.04571	0.008
Rural					0.00465	0.359
Eastern Cape					0.00000	0.182
Northern Cape					0.00000	0.137
Free State					0.00000	0.036
KwaZulu_Natal					0.00000	0.137
North West					0.00001	0.092
Gautemg					0.00000	0.996
Mpumalanga					0.00461	0.658
Northern Province					-0.00110	0.925
Remittance x Black					0.00952	0.394
Pension amount x Black					-0.01858	0.065
Predicted income x Black					-0.01049	0.327
Remittance x poverty					-0.01886	0.069
Pension amount x poverty					0.01577	0.151
Predicted income x poverty					0.03279	0.002
Poverty					-0.01504	0.205
Constant term	0.87300	0.000	0.86142	0.000	0.41215	0.000

The evidence from the statistical analysis of Statistic South Africa's *Income and Expenditure Survey 2000* and the *Labour Force Survey* documents the important impact of social grants on school attendance. Poverty and its associated consequences erode the opportunities for children and youth to attend school, fomenting a vicious cycle of destitution by undermining the household's capacity to accumulate the human capital necessary to break the poverty trap. But both the State Old Age Pension and the Child Support Grant are statistically significantly associated with improvements in school attendance, and the magnitudes of these impacts are substantial. This analysis only measures the direct and static link between social security and education. To the extent that social grants promote school attendance, they contribute to a virtuous cycle with long term dynamic benefits that are not easily measured by statistical analysis.

EDUCATION ANALYSIS USING THE OCTOBER HOUSEHOLD SURVEYS

A similar analysis of October Household Survey data yielded corroborating results. The table below provides summary statistics by *per capita* expenditure quartile for the sample used in the analysis, focusing on children in three-generation households. The table documents the significant correlation between education and poverty—the average years of schooling of the household head falls steadily as households move down the expenditure quartiles. The average schooling of the head of household in the highest quartile is 6.4 years, but only 3.4 years for the head of household in the poorest quartile. Full-time enrolment rates reach of high of 91% in the highest quartile, but fall to 84% in the poorest quartile. Likewise, the data documents the rural/urban poverty divide. Seventy-five percent of the poorest households but only forty-seven percent of those in the highest quartile live in rural areas. The table also paints a picture of household size—the average household in the highest quartile includes seven people, while the poorest households include on average ten people.

Table 3.2: Summary statistics from the October Household Survey for Black Children Living in Three-Generation Households

Variable	Total		Richest 1/4		Second 1/4		Third 1/4		Poorest 1/4	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Full-time student	86%	0.34	91%	0.29	89%	0.31	87%	0.33	84%	0.37
Household monthly pension receipt	294	324	262	310	296	329	324	347	277	306
Percent living in pensioner households	52%	0.50	47%	0.50	51%	0.50	56%	0.50	51%	0.50
Percent female	51%	0.50	52%	0.50	53%	0.50	51%	0.50	50%	0.50
Years of schooling of household head	4.2	4.2	6.4	4.9	5.4	4.3	4.2	4.2	3.4	3.8
Age	11.8	3.7	12.0	3.7	11.9	3.7	11.8	3.8	11.8	3.7
Percent rural	68%	0.47	47%	0.50	57%	0.49	70%	0.46	75%	0.43
Percent urban	32%	3.23	53%	0.50	43%	0.51	30%	0.54	25%	0.57
Household size	8.7	2.5	7.0	2.5	7.5	2.5	8.3	3.1	9.7	3.4
# observations	13794		971		2539		4275		6009	

The following analysis finds significant positive correlation between pensions and school attendance for each of the social grant variables analysed–monthly pension receipts, the household pension receipt binary variable (dummy), household pension eligibility dummy, and instrumented monthly pension receipts. Multivariate results presented in the tables below show that, controlling for education of the household head, student's gender and age, provincial effects, rural areas, household size, and the age structure of the household, both continuous pension receipts and the discrete pension variable have a positive and highly significant correlation with full-time school attendance.

In order to evaluate the gender effects of the State Old Age Pension, the effects of the social grant on school-age boys and girls were estimated separately, and by expenditure quartile. The table below shows the impact of the SOAP on boys living in the bottom quarter of each province's households as measured by expenditure per capita. The "monthly SOAP pension receipt" variable measures the rand amount of pension received by the household. This variable is significant at a 99% level. In this model, each R500 of pension is associated with a 3% higher likelihood of school attendance by boys in the household.

Table 3.3: The impact of the State Old Age Pension on school attendance by boys in the poorest households (pension amount)

OHS Education Model 1	effect (coefficient)	standard error	student t-statistic	Significance level
monthly SOAP pension receipt	0.00006	0.00002	2.74400	0.00600
Education level of household head	0.00754	0.00171	4.42200	0.00000
Age	2.69889	0.31492	8.57000	0.00000
Age 2	-0.31440	0.04268	-7.36600	0.00000
Age 3	0.01594	0.00247	6.46500	0.00000
Age 4	-0.00030	0.00005	-5.80100	0.00000
Western Cape	0.01788	0.06717	0.26600	0.79000
Eastern Cape	-0.03095	0.05594	-0.55300	0.58000
Free State	0.01660	0.05716	0.29000	0.77200
KwaZulu-Natal	-0.02514	0.05555	-0.45300	0.65100
North West	-0.10714	0.05623	-1.90500	0.05700
Gauteng	0.02884	0.05488	0.52600	0.59900
Mpumalanga	0.00290	0.05668	0.05100	0.95900
Limpopo	0.00687	0.05666	0.12100	0.90400
rural household	0.03612	0.01877	1.92500	0.05400
Household size	-0.00226	0.00199	-1.13500	0.25700
Constant	-7.56243	0.83296	-9.07900	0.00000

The findings contrast sharply with the results for the higher quartiles, which are reported in the table below. Pooling the higher three quartiles, there is no significant relationship between receipt of the State Old Age Pension and school enrolment. This demonstrates the differential impact of social grants on poor and less poor households.

Table 3.4: The impact of the State Old Age Pension on school attendance by boys in higher income households

OHS Education Model 2	effect (coefficient)	standard error	student t-statistic	significance level
monthly SOAP pension receipt	0.00001	0.00001	0.45400	0.65000
education level of household head	0.00507	0.00110	4.60000	0.00000
Age	2.61388	0.22441	11.64800	0.00000
Age 2	-0.31452	0.03038	-10.35400	0.00000
Age 3	0.01647	0.00175	9.39000	0.00000
Age 4	-0.00032	0.00004	-8.68400	0.00000
Western Cape	0.07383	0.06190	1.19300	0.23300
Eastern Cape	0.06007	0.04813	1.24800	0.21200
Free State	0.02105	0.04943	0.42600	0.67000
KwaZulu-Natal	0.02000	0.04787	0.41800	0.67600
North West	0.03524	0.04876	0.72300	0.47000
Gauteng	0.02717	0.04992	0.54400	0.58600
Mpumalanga	0.07838	0.04912	1.59600	0.11100
Limpopo	0.06164	0.04855	1.27000	0.20400
rural household	-0.02917	0.01155	-2.52500	0.01200
household size	-0.00295	0.00154	-1.91600	0.05500
Constant	-7.01423	0.59642	-11.76100	0.00000

The result from Model 1 above is corroborated with a specification that includes a binary variable for pension receipt.[32] A boy in a household receiving a pension is 3% more likely to be enrolled in school full-time. The age of the child is related in a complex non-linear manner to school attendance—polynomial terms to the fourth order are statistically significant. As with the previous analysis of the *Income and Expenditure Survey 2000*, the education level of the household head is one of the most significant determinants of school attendance of children and youth in the household. This is true for all the models estimated. As with the previous analysis, the geographic variables are not consistently statistically significant.

Table 3.5: The impact of the State Old Age Pension on school attendance by boys in the poorest households (pension receipt)

OHS Education Model 3	effect (coefficient)	standard error	student t-statistic	significance level
monthly SOAP pension receipt	0.03274	0.01322	2.47700	0.01300
Education level of household head	0.00752	0.00171	4.39900	0.00000
Age	2.70114	0.31500	8.57500	0.00000
Age 2	-0.31464	0.04269	-7.37000	0.00000
Age 3	0.01596	0.00247	6.46800	0.00000
Age 4	-0.00030	0.00005	-5.80400	0.00000
Western Cape	0.01758	0.06719	0.26200	0.79400
Eastern Cape	-0.02907	0.05597	-0.51900	0.60400
Free State	0.01855	0.05719	0.32400	0.74600
KwaZulu-Natal	-0.02463	0.05557	-0.44300	0.65800
North West	-0.10658	0.05628	-1.89400	0.05800
Gauteng	0.03168	0.05489	0.57700	0.56400
Mpumalanga	0.00397	0.05671	0.07000	0.94400
Limpopo	0.00718	0.05668	0.12700	0.89900
rural household	0.03661	0.01877	1.95100	0.05100
Household size	-0.00201	0.00198	-1.01400	0.31100
Constant	-7.57416	0.83318	-9.09100	0.00000

The results for girls in the lowest income quartile are even more striking. The table below presents the results using the model specification that includes the rand amount of pension income. Girls in households receiving R500 of government pension are six percent more likely to be enrolled in school. This effect is twice that of the effect for boys. The effect of the level of education of the household head is approximately the same for both boys and girls. Household size, however, affects boys and girls differently. The number of people in the household has no measurably significant impact on school attendance by boys. However, household size has a significantly negative impact on school attendance by girls. This is consistent with the hypothesis that households, when facing limited means, are more likely to allocate scarce resources to supporting the education of boys rather than girls. This explains why social grants have a greater impact for girls: pensions relax the resource constraints that force households to ration education, which disproportionately affects girls.

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[32] Binary variables are generally referred to as "dummy variables", and take on only two values— zero or one. In this case, the variable equals one if the household receives a pension.

Table 3.6: The impact of the State Old Age Pension on school attendance by girls in the poorest households (pension amount)

OHS Education Model 4	effect (coefficient)	standard error	student t-statistic	Significance level
monthly SOAP pension receipt	0.00012	0.00002	5.48800	0.00000
education level of household head	0.00682	0.00173	3.94000	0.00000
Age	3.73614	0.32384	11.53700	0.00000
Age 2	-0.46303	0.04369	-10.59800	0.00000
Age 3	0.02502	0.00251	9.95500	0.00000
Age 4	-0.00050	0.00005	-9.55900	0.00000
Western Cape	-0.03629	0.06695	-0.54200	0.58800
Eastern Cape	0.00583	0.05812	0.10000	0.92000
Free State	0.00822	0.05876	0.14000	0.88900
KwaZulu-Natal	-0.04651	0.05715	-0.81400	0.41600
North West	-0.14125	0.05824	-2.42500	0.01500
Gauteng	-0.03427	0.05678	-0.60400	0.54600
Mpumalanga	-0.04107	0.05887	-0.69800	0.48500
Limpopo	-0.03556	0.05877	-0.60500	0.54500
rural household	0.00785	0.01885	0.41700	0.67700
household size	-0.00410	0.00205	-2.00200	0.04500
constant	-10.09841	0.86084	-11.73100	0.00000

Again, the results from Model 4 above are corroborated with a specification that includes a binary variable for pension receipt. A girl in a household receiving a pension is 7% more likely to be enrolled in school full-time.

Table 3.7: The impact of the State Old Age Pension on school attendance by girls in the poorest households (pension receipt)

OHS Education Model 5	Effect (coefficient)	standard error	student t-statistic	significance level
monthly SOAP pension receipt	0.07341	0.01369	5.36100	0.00000
education level of household head	0.00699	0.00174	4.01700	0.00000
Age	3.71992	0.32385	11.48600	0.00000
Age 2	-0.46076	0.04369	-10.54500	0.00000
Age 3	0.02489	0.00251	9.90100	0.00000
Age 4	-0.00050	0.00005	-9.50400	0.00000
Western Cape	-0.03824	0.06698	-0.57100	0.56800
Eastern Cape	0.00842	0.05815	0.14500	0.88500
Free State	0.01347	0.05883	0.22900	0.81900
KwaZulu-Natal	-0.04304	0.05719	-0.75300	0.45200
North West	-0.13659	0.05832	-2.34200	0.01900
Gauteng	-0.02839	0.05683	-0.50000	0.61700
Mpumalanga	-0.03558	0.05894	-0.60400	0.54600
Limpopo	-0.03411	0.05879	-0.58000	0.56200
rural household	0.00863	0.01885	0.45800	0.64700
household size	-0.00353	0.00203	-1.73900	0.08200
constant	-10.06957	0.86091	-11.69600	0.00000

According to the baseline model (1) in the table below, a one hundred rand increase in monthly social grant transfers corresponds to a 3.8 percent increase in the likelihood of full-time school attendance. From model (2), children living in three-generation households with pensioners are on average 3.1 percent more likely to attend school than are their peers in non-pension households. Likewise, model (3) documents that having an age-eligible member of the household is also positively and significantly correlated with school attendance, suggesting that this result is not due to endogeneity in the specification. For ease of interpretation this discussion presents *Ordinary Least Squares* regressions, however, the probit regressions yield essentially the same results.

Table 3.8: Effects of State Old Age Pensions on Child School Attendance

	[1]	[2]	[3]
Monthly pension receipts (R000s)	0.0384	-	-
T-Statistic	4.2550		
Household pension dummy	-	0.0307	-
		5.2650	
Household eligibility dummy	-	-	0.0273
			4.5820
Household Head Level of Education	0.0062	0.0064	0.0063
	9.2630	9.5300	9.4140
Female	-0.0137	-0.0136	-0.0134
	-2.5550	-2.5270	-2.5020
Age	2.6942	2.6932	2.6962
	20.1570	20.1560	20.1740
Age^2	-0.3252	-0.3251	-0.3255
	-18.0060	-18.0060	-18.0260
Age^3	0.0171	0.0171	0.0172
	16.4710	16.4720	16.4920
Age^4	-0.0003	-0.0003	-0.0003
	-15.4360	-15.4380	-15.4570
Rural	-0.0091	-0.0091	-0.0086
	-1.2520	-1.2600	-1.1820
Household size	-0.0001	-0.0003	-0.0004
	-0.0430	-0.1260	-0.2060
R^2	0.1651	0.1657	0.1653
# observations	13794	13794	13794

An analysis of intra-quartile regressions demonstrates that the above findings are driven by the influence of pensions on the school-attendance behaviour of children living in the poorest households. There is a strong relationship between poverty as described by household expenditure brackets and school attendance (chi-squared test of independence 69.0). The table below shows that pension variables are not significant determinants of school attendance for children living in the upper three-quarters of the expenditure distribution. Whereas the baseline coefficient on household pensions was 0.038 for the entire sample, in a restricted regression considering only households in the poorest expenditure quartile, the same specification returns a highly significant coefficient of 0.079.

Table 3.9: Impact of Poverty on the Effects of State Old Age Pensions on Child School Attendance (pension amount)

	Richest 1/4 [1]	Second 1/4 [2]	Third 1/4 [3]	Poorest 1/4 [4]
Monthly pension receipts (R000s)	0.0271	0.0182	-0.0007	0.0787
T-Statistic	0.8790	0.8920	-0.0450	5.1420
Household head level of education	0.0032	0.0037	0.0056	0.0068
	1.5910	2.5580	4.6780	5.9300
Female	-0.0254	-0.0217	0.0000	-0.0203
	-1.4060	-1.8500	0.0010	-2.3810
Age	1.5680	2.1366	2.6646	3.1314
	3.4410	7.3420	11.2450	14.8540
Age^2	-0.1936	-0.2537	-0.3246	-0.3776
	-3.1530	-6.4620	-10.1420	-13.2410
Age^3	0.0105	0.0131	0.0172	0.0199
	2.9640	5.8080	9.3560	12.0970
Age^4	-0.0002	-0.0003	-0.0003	-0.0004
	-2.8510	-5.3390	-8.8270	-11.3350
Rural	-0.0272	-0.0431	-0.0053	0.0196
	-1.2060	-2.9610	-0.4130	1.5740
Household size	0.0036	0.0085	-0.0006	-0.0021
	0.4750	1.6160	-0.1460	-0.6430
R^2	0.0923	0.1330	0.1529	0.2065
# observations	971	2539	4275	6009

Similarly, the discrete pension variable model (8) in the table below documents that poor children are nearly 5 percent more likely to attend school if they live with a

pensioner. A similar probit model yields essentially the same results. Models (5), (6) and (7) for the higher income quartiles demonstrate no significant relationship between pensions and school attendance. These models underscore the importance of carefully evaluating the interaction between poverty and the impact of social grants.

Table 3.10: Impact of Poverty on the Effects of State Old Age Pensions on Child School Attendance (pension receipt by household)

	Richest 1/4 [5]	Second 1/4 [6]	Third 1/4 [7]	Poorest 1/4 [8]
Household pension dummy	0.0286	0.0086	0.0156	0.0484
	1.4840	0.6520	1.4930	5.2290
Household head level of education	0.0034	0.0036	0.0059	0.0069
	1.6990	2.4970	4.9440	6.0170
Female	-0.0267	-0.0220	0.0000	-0.0198
	-1.4780	-1.8730	0.0040	-2.3250
Age	1.5338	2.1412	2.6593	3.1274
	3.3620	7.3580	11.2270	14.8360
Age^2	-0.1893	-0.2544	-0.3239	-0.3771
	-3.0790	-6.4790	-10.1240	-13.2240
Age^3	0.0102	0.0132	0.0172	0.0199
	2.8940	5.8260	9.3380	12.0800
Age^4	-0.0002	-0.0003	-0.0003	-0.0004
	-2.7850	-5.3580	-8.8090	-11.3180
Rural	-0.0276	-0.0428	-0.0066	0.0203
	-1.2250	-2.9420	-0.5170	1.6290
Household size	0.0032	0.0091	-0.0021	-0.0012
	0.4270	1.7460	-0.5590	-0.3860
R^2	0.0937	0.1329	0.1534	0.2066
# observations	971	2539	4275	6009

State Old Age Pensions give a stronger boost to the school attendance rates of girls – who among the poor tend to have lower rates of schooling than boys. In the table below, an interaction term is introduced into the model, testing whether pensions have differential effects by gender. Results are presented for children living in the poorest quarter of the sample – where the transfer has its impact. The coefficient on the gender variable indicates that school-age girls are on average about 4 percent less likely to attend school than boys with similar demographic and household characteristics. One

hundred rand of pension receipts raises the likelihood that a boy in the poorest quarter of the population will attend school by 4 percent. The same one hundred rand, however, increases the likelihood that a girl will attend school by 11 percent. Other specifications show similar results. Girls who live in pensioner households are 7 percent more likely to attend school, compared with 2.7 percent for boys.

Table 3.11: Impact of Gender on the Effects of State Old Age Pensions on Child School Attendance

	[1]	[2]	[3]
Monthly pension receipts (R000s)	0.0421	-	-
T-Statistic	2.0140		
Household pension dummy	-	0.0268	-
		2.1320	
Household eligibility dummy	-	-	0.0293
			2.2770
Household head level of education	0.0069	0.0070	0.0070
	5.9660	6.0570	6.0150
Female	-0.0402	-0.0416	-0.0343
	-3.4940	-3.4280	-2.7350
Monthly pension (R000s) receipt by female	0.0716	-	-
	2.5730		
Household pension received by female	-	0.0429	-
		2.5200	
Female in household pension eligible	-	-	0.0263
			1.5360
Age	3.1317	3.1265	3.1175
	14.8630	14.8390	14.7790
Age2	-0.3776	-0.3769	-0.3757
	-13.2460	-13.2210	-13.1660
Age3	0.0199	0.0198	0.0198
	12.0990	12.0730	12.0220
Age4	-0.0004	-0.0004	-0.0004
	-11.3330	-11.3070	-11.2580
Rural	0.0196	0.0202	0.0223
	1.5760	1.6260	1.7940
Household size	-0.0020	-0.0011	-0.0013
	-0.6100	-0.3480	-0.4040
R^2	0.2074	0.2074	0.2059
# observations	6009	6009	6009

The statistical evidence from this research documents the extent to which poverty exerts a negative impact on school enrolment rates. Many poor children cannot attend school due to the costs associated with education, including the necessity to work to supplement family income. In addition, communities that are resource-constrained provide lower quality educational services, which negatively affects enrolment rates. Social security grants counter these negative effects by providing households with more resources to finance education. The old-age pension transfer programme is particularly effective in this regard. Findings show a positive and statistically significant effect of government pension transfers on school attendance rates of poor children. The effects for poor school-age girls are particularly strong.

For example, in poor households, defined as those falling into the lower quarter of all households in a given province ranked by expenditure per capita, school-age boys are 3 percent more likely to attend school full time if the household receives a pension benefit.   The effect is even more pronounced for girls: girls who live in pensioner households are 7 percent more likely to be enrolled full time in school than are their peers who live in households without a pension.   Quantitatively, a five hundred rand increase in official pension transfers to a poor household of five would increase the probability of attending school by an estimated 2 percent for a school-age boy and 5 percent for a girl. Likewise, a statistical model for that October Household Survey data that does not support income quartile analysis demonstrates a positive and statistically significant effect of household pension receipt on full-time school attendance.

3.4) THE HOUSEHOLD SPENDING IMPACT OF SOCIAL SECURITY

As discussed earlier in this chapter, two different studies on the impact of the State Old Age Pension (SOAP) on expenditure shares in South Africa arrived at conflicting results. In 1998, Case and Deaton reported that households do not spend pension income differently than non-pension income. Case and Deaton attributed this finding to income pooling within the household and thus concluded "a rand is a rand" no matter what the source. However, in 2003, Maitra and Ray departed from the model specification used by Case and Deaton by treating household *per capita* equivalence income and pension amount as endogenous variables. In this manner, Maitra and Ray found exactly the opposite effect – households that receive transfers (both private and public) have different patterns of expenditure than other households.   In particular, where Engel's Law states that an increase in income is associated with a decrease in the proportion of expenditure spent on food, households receiving transfers actually spend a greater proportion on food than similar households that do not receive such a transfer. A possible explanation put forth by Maitra and Ray for these findings is that "it matters who receives the transfer within the household." Under the premise that South African households are non-unitary in nature (that is, different members of the household have diverging preferences for the allocation of overall household expenditure), it is possible that pension recipients become more empowered in the household decision-making process. As a result, household expenditure has a greater likelihood to reflect their preferences. If this is true, changes in how and to whom grants are distributed would have a significant impact on household well being.

Table 3.12 shows the weighted mean of expenditure shares for households that fall between the twentieth and thirtieth percentile of total household income, the decile in which most of the State Old Age Pensions are concentrated.

Table 3.12 Households between the 20th and 30th Percentile of Total Income

. Expenditure Category	Non-Pensioners		Pensioners	
	# Obs.	Spending Share	# Obs.	Spending Share
Food	2132	41.3622%	645	43.9445%
Tobacco	693	4.8145%	209	3.1355%
Clothing	2132	5.0107%	645	4.4643%
Housing	2132	6.8624%	645	6.6656%
Fuel	2132	3.9831%	645	4.7296%
Furniture &	2132	1.3922%	645	1.4893%
Household	2132	2.7846%	645	3.0373%
Medical Care	2132	0.7253%	645	1.0513%
Transportation	2132	3.5489%	645	2.1610%
Communication	2132	0.9212%	645	0.9104%
Personal Care	2132	5.4028%	645	4.3008%
Holiday	177	0.3130%	38	0.0379%
Debt	2132	1.8140%	645	1.1600%
Debt Service	2132	0.0054%	645	0.0003%
Total income	2134	7804	645	7755
SOAP amount	2134	0	645	6421

The average total income of the two groups of households is comparable (R7804 for non-pensioner households versus R7755 for pensioner households. However, the composition of spending is significantly different. The pensioner households spend a larger proportion on food (43.9% versus 41.4%), a smaller proportion on tobacco (3.1% versus 4.8%), less on clothing (4.5% versus 5.0%), more on fuel (4.7% versus 4.0%), more on medical care (1.1% versus 0.7%), less on transportation (2.2% versus 3.5%), less on personal care (4.3% versus 5.4%), and less on holidays (less than 0.1% versus 0.3%). In addition, pensioner households have a lower debt burden and spend less on debt service.

The question arises as to whether these differences can be attributed to the existence of the pension, or whether pension receipt is just a coincidental factor. For pensioner households, the pension income constitutes 83% of total household income. For any given comparison between two variables, there remains the risk that a third factor determines both variables and hence the observed correlation is spurious. For instance, pensioner households spend a higher proportion on medical care. The existence of elderly individuals in the household might explain this relationship—the more elderly individuals, the more likely the household will receive a pension. And the

more likely the household will spend more on medical care, because medical care costs increase with age. To address these questions, this study develops a multiple regression model to control for these additional variables, as well as the endogeneity of income as discussed above.

METHODOLOGY

The model is constructed based on the methodology of Maitra and Ray, as discussed in the previous section with respect to the analysis of school attendance. As mentioned previously, Maitra and Ray specify their model by assuming that household income *per capita* adult equivalence, pension amount, and remittance amount are not exogenous variables but are rather determined through a set of three simultaneous equations. To address these issues, this study once again employs a three-stage least square estimation process. The first stage of this process involves generating a new variable, predicted income *per capita* adult equivalence, that, unlike actual income *per capita* adult equivalence, is not correlated with the error term in the expenditure share equation. This variable is then used in a second stage model to predict amounts of social grants received. Then the income and social grant instrumental variables are used in the third stage to predict expenditure shares. To test for model fragility, the study also employs an ordinary least squares estimation technique with binary (dummy) variables for social grant receipt and a third model that controls for the number of pensioners.

RESULTS ON HOUSEHOLD EXPENDITURE

A summary of the significant results is shown in table 3.13, with all coefficients and t-statistics reported in table 3.14. For instance, a family receiving R100 more in pension amount will spend 0.181 percentage points more on food than a similar family who receives that extra R100 through ordinary income. Likewise, according to the second specification, households that include a pensioner spend 2.3 percentage points of total expenditure more on food than non-pensioner households with comparable incomes do. This econometric analysis supports the earlier indicative findings in table 3.12 – households with pensioners do indeed spend more on food than non-pensioner households do. These results are consistent with those of Maitra and Ray. This is the most robust finding of the expenditure analysis—regardless of the type of social grant, or how the food share is calculated, social grants are associated with an increased allocation of spending in a manner that supports better nutrition.

The impact of social grants affects non-food expenditure as well. Households that receive social grants have significantly different spending patterns than similar households that do not receive these grants. Social grant recipients spend a greater proportion on basic necessities – food, fuel, housing and household operations. These households spend less on medical care, debt service and tobacco. Only the State Old Age Pension exerted a statistically significant impact on housing expenditure, and only in the third model. Receipt of a State Old Age Pension was associated with a 0.6 percentage point increase in housing expenditure. All three grants, however, were

significantly associated with increased allocations for expenditures associated with household operations, with the Child Support Grant exerting the greatest quantitative impact—raising the expenditure share by more than one percentage point. Both the State Old Age Pension and the Disability grant were associated with increased allocations for fuel—by approximately a quarter of one percent.

Table 3.13: The link between social grants and expenditure shares (summary)

Expenditure Share	Type of Grant	Model 1: Impact per 100 rand	Model 2: Impact of receipt	Model 3: impact of receipt
Food	SOAP	0.181 *	2.342 *	1.465 *
	CSG	0.125 **	1.161 *	1.139 *
	DG	0.047 *	2.358 *	2.338 *
Tobacco	SOAP	-	-	-
	CSG	-	-0.434 ***	-0.430 ***
	DG	-	-	-
Housing	SOAP	-	-	0.642 **
	CSG	-	-	-
	DG	-	-	-
Fuel	SOAP	0.015 **	0.273***	-
	CSG	-	-	-
	DG	0.005 **	0.262 **	0.262 **
Household Operation	SOAP	0.007 **	0.142 **	-
	CSG	0.024 *	1.287 **	1.276 **
	DG	0.003 *	0.153 *	0.151 *
Medical	SOAP	-	-0.947 *	-0.635 *
	CSG	-	-0.245 **	-0.243 **
	DG	-	-	-
Total Debt	SOAP	-0.250 *	-	-
	CSG	-0.435 ***	-	-
	DG	-	-	-
Debt Service	SOAP	-	-0.102 **	-0.077 **
	CSG	-0.012 ***	-0.075 ***	-0.075 ***
	DG	-	-	-

Notes:
Model 1: Three stage least squares (3SLS) model using predicted variables for State Old Age Pension (SOAP), Child Support Grant (CSG), and Disability Grant (DG).
Model 2: Ordinary least squares (OLS) model using binary (dummy) variables representing receipt of SOAP, CSG, and DG.
Model 3: Ordinary least squares (OLS) model using number of pensioners for the SOAP and binary (dummy) variables representing receipt of CSG and DG.
Statistics represent estimated coefficients; asterisks are coded as follows:
* significant at the 5% level
** significant at the 10% level
*** significant at the 15% level

Table 3.14: The link between social grants and expenditure shares (statistics)

Share	Grant	Model 1	Model 2	Model 3
Food	Pension	.0000181 (6.80)*	.0234189 (4.19)*	0.0146481 (3.63)*
	Child Support	.0000125 (1.73)**	.0116115 (2.43)*	0.0113926 (2.39)*
	Disability	4.71e-06 (5.54)*	.0235795 (5.59)*	0.0233758 (5.34)*
Tobacco	Pension	-2.74E-07 (-0.18)	.0009697 (0.31)	0.0003817 (0.16)
	Child Support	-1.73E-06 (-0.39)	-0.00434 (-1.48)***	-0.0042958 (-1.47)***
	Disability	-5.57E-07 (-1.21)	-0.0027 (-1.14)	-0.0027059 (-1.14)
Housing	Pension	-1.25E-06 (-0.54)	.0043363 (0.89)	0.00642 (1.82)**
	Child Support	-4.89E-06 (-0.77)	-0.00285 (-0.68)	-0.002988 (-0.72)
	Disability	-2.04E-07 (-0.27)	-0.00104 (-0.27)	-0.0011285 (-0.29)
Fuel	Pension	1.51E-06 (1.69)**	.0027325 (1.46)***	0.0013585 (1.00)
	Child Support	1.62E-06 (0.67)	0.001985 (1.24)	0.0019955 (1.25)
	Disability	5.04E-07 (1.77)**	0.002622 (1.79)**	0.0026208 (1.79)**
Household Operation	Pension	7.19e-07 (1.86)**	.0014257 (1.76)**	.0008013 (1.37)
	Child Support	2.35e-06 (2.23)*	.0012866 (1.86)**	.0012764 (1.84)**
	Disability	3.05e-07 (2.47)*	.0015263 (2.4)*	.0015144 (2.38)*
Medical	Pension	1.05E-07 (0.13)	-.0094714 (-5.74)*	-0.0063468 (-5.32)*
	Child Support	-2.91E-06 (-1.35)	-0.00245 (-1.74)**	-0.0024252 (-1.72)**
	Disability	2.12E-07 (0.84)	0.001457 (1.13)	0.0015237 (1.18)
Debt	Pension	-.000025 (-2.37)*	-.0240303 (-1.08)	.0076321 (0.48)
	Child Support	-.0000435 (-1.51)***	-.0225156 (-1.19)	-.0228754 (-1.21)
	Disability	-2.43e-06 (-0.72)	-.0117609 (-0.68)	-.0117574 (-0.68)
Debt Service	Pension	-1.76e-07 (-0.61)	-.0010222 (-1.69)**	-.0007764 (-1.78)**
	Child Support	-1.21e-06 (-1.55)***	-.0007533 (-1.46)***	-.0007549 (-1.47)***
	Disability	-9.82e-08 (-1.07)	-.0004905 (-1.04)	-.0004864 (-1.03)

(First number represents coefficient estimate, below that is the calculated t-statistic.)

3.5) SOCIAL SECURITY AND NUTRITION

The results of the expenditure model presented in the previous section provide important insights into the relationship between social security and the nutrition of household members. In addition, this study more directly assesses the links between access to nutrients and social grants by analysing specific Statistics South Africa survey questions related to adult and child hunger.

FOOD EXPENDITURE SHARES

The household food expenditure regressions are summarised in the table below, following the methodology outlined in the previous section. The first set of results show the impacts of social grants (and other explanatory variables) on the expenditure shares for all food items. The second set of results document the impacts on the expenditure shares for basic food items, which include grain products, vegetables, fruits, milk, cheese, and eggs.

Table 3.15: Household expenditure model of food shares

Explanatory variable	All Food Items Coefficient	P-value		Basic Food Items Coefficient	P-value	
ln(household income per capita)	-0.077619	0.000	*	-0.045139	0.000	*
household pension amount	1.520000	0.000	*	0.869000	0.000	*
remittance received by household	0.000276	0.995		0.011400	0.674	
(household pension amount)Sq.	-0.000178	0.000	*	0.000000	0.000	*
(remittance received by household)Sq.	-0.000001	0.000	*	0.000000	0.000	*
years of education attained by the household head	0.368630	0.000	*	0.080860	0.074	*
(years of education attained by the household head)Sq.	-0.034800	0.000	*	-0.013520	0.000	*
Child Support Grant?	1.474980	0.002	*	1.177060	0.000	*
Disability Grant?	2.495010	0.000	*	1.252380	0.000	*
Number of children	-1.131300	0.000	*	-0.531490	0.000	*
Number of adult non-eligible for pension	-0.745570	0.000	*	-0.441240	0.000	*
Number of male elderly	0.960430	0.038	*	0.458000	0.119	
Number of female elderly	-0.902540	0.008	*	-0.434370	0.043	*
Age of the household head	-0.060260	0.000	*	-0.046580	0.000	*
(Age of the household head)Sq.	0.000057	0.000	*	0.000042	0.000	*
Female household head?	-0.769440	0.001	*	-0.160630	0.259	
Black/African?	2.567240	0.000	*	1.985260	0.000	*
Coloured?	3.343110	0.000	*	-0.117260	0.720	
Indian/Asian?	0.597420	0.377		-0.653830	0.127	
Rural?	1.571730	0.000	*	1.438900	0.000	*
Remittance x black	0.000254	0.000	*	0.000125	0.000	*
Pension amount x black	-0.000303	0.001	*	-0.000145	0.012	*
Predicted income x black	-0.000200	0.000	*	-0.000159	0.000	*
Remittance x poverty	-0.000408	0.005	*	-0.000225	0.015	*
Pension amount x poverty	-0.001340	0.000	*	-0.000887	0.000	*
Predicted income x poverty	0.002130	0.000	*	0.001100	0.000	*
Poverty?	-1.680700	0.011	*	-0.826660	0.049	*
Eastern Cape	-4.640740	0.000	*	-0.777930	0.003	*
Northern Cape	-2.842830	0.000	*	-3.008320	0.000	*
Free State	-8.700380	0.000	*	-4.056780	0.000	*
KwaZulu_Natal	0.318310	0.418		1.424990	0.000	*
North West	-5.475550	0.000	*	-3.015200	0.000	*
Gautemg	-2.145050	0.000	*	-0.588320	0.017	*
Mpumalanga	-5.370670	0.000	*	-2.754130	0.000	*
Limpopo	-5.527330	0.000	*	-1.530720	0.000	*
Constant term	102.332300	0.000	*	59.111780	0.000	*

The statistical results document the positive significant impact of social security grants on food share expenditures, implying improvements in household nutrition. The

coefficient on the State Old Age Pension indicates that each thousand rand of annual pension receipt is associated with an increase of 1.5 percentage points in the share of household spending on all food items, and an increase nearly one percentage point in the share of spending on basic food items. Likewise, receipt of a Child Support Grant was associated with an increase of 1.5 percentage points in the share of household spending on all food items, and an increase of 1.2 percentage points in the share of spending on basic food items. Similarly, receipt of a Disability Grant was associated with an increase of 2.5 percentage points in the share of household spending on all food items, and an increase of 1.3 percentage points in the share of spending on basic food items. These results are all statistically significant at a 99% level.

The coefficients on household income document that expenditure shares for both all food items and basic food items tend to decline as households receive more non-grant income.   This finding is consistent with results generally obtained in household expenditure models for other countries.   The income effects may be interacting with geographic variables included in the analysis.   The provincial and rural/urban variables in the model are statistically significant in nearly every case, documenting the important variation in different parts of the country. For example, the average expenditure share on food in rural areas, where the median income is relatively low, is 1.5 percentage points higher than that in urban areas. This may reflect problems with the specification of income in the model, or alternatively a relatively lower price for food in rural areas which results in expenditure substitution.   The model was also estimated for each province, and the provincial results are presented in the table below.

Table 3.16: Food share household expenditure model by province

Province	Statistic	Income	State Old Age Pension	Child Support Grant	Disability Grant	Remittances	Education
Western Cape	Coefficient	-0.10027	0.00000	0.03743	0.03009	0.00000	0.01091
	P-value	0.00000	0.68700	0.00600	0.01100	0.37700	0.00000
Eastern Cape	Coefficient	-0.07856	0.00002	-0.00174	0.02454	0.00001	0.00856
	P-value	0.00000	0.00000	0.90700	0.02400	0.00300	0.00000
Northern Cape	Coefficient	-0.09225	0.00001	0.00560	0.03877	0.00000	0.00815
	P-value	0.00000	0.09300	0.73000	0.00200	0.08000	0.01200
Free State	Coefficient	-0.03552	0.00000	0.00783	0.02973	0.00001	0.00168
	P-value	0.00200	0.63100	0.69600	0.06700	0.00400	0.51500
KwaZulu-Natal	Coefficient	-0.05946	0.00002	0.03501	0.00305	0.00000	0.00043
	P-value	0.00000	0.00000	0.00700	0.77400	0.03000	0.78600
North West	Coefficient	-0.05482	0.00001	0.00971	0.02784	0.00000	0.00126
	P-value	0.00000	0.06000	0.57400	0.06200	0.22200	0.57700
Gauteng	Coefficient	-0.05646	0.00001	0.03489	-0.00199	0.00000	0.00305
	P-value	0.00000	0.03300	0.01400	0.90200	0.90700	0.17400
Mpumalanga	Coefficient	-0.05264	0.00002	0.00935	0.02156	0.00000	0.00113
	P-value	0.00000	0.01300	0.38000	0.14600	0.58900	0.57900
Limpopo	Coefficient	-0.05121	0.00001	0.00638	0.02662	0.00000	0.00308
	P-value	0.00000	0.05100	0.65400	0.07900	0.70600	0.15800

The statistical significance is weaker at a provincial level because the sample sizes for each regression are smaller.   Nevertheless, all the significant results corroborate the national findings.   For each province, higher non-grant income is

negatively and statistically significantly associated with lower expenditure shares on food. All statistically significant findings for social grants yield positive correlations between all the social grant variables and the expenditure share on food. Likewise, a greater amount of remittances and more years of schooling of the household head are associated with higher expenditure shares on food, controlling for the effect of income.

HUNGER

In order to test the results of the expenditure model, this study analysed adult and child hunger as direct measures correlated with nutritional status. In the household section of the September 2000 *Labour Force Survey*, Statistics South Africa captured information about how many children and adults experienced hunger in the previous year because of insufficient money to buy food. This data supports the analysis of hunger using the same methodology adopted for education. This study follows the Statistics South Africa survey question, defining adult hunger as a binary variable equal to one if the household reported an adult or older child suffering from hunger in the previous year because of insufficient money to buy food. Likewise, child hunger is measured as a binary variable equal to one if the household reported a young child (under seven years of age) suffering from hunger in the previous year because of insufficient money to buy food. The table below presents summary statistics on the prevalence of hunger in households by province. Nationally, nearly one in five households have experienced hunger over the past year. The highest income provinces—Gauteng and the Western Cape—have the lowest prevalence rates of hunger (13.58% and 10.41% respectively). The prevalence rate of hunger is highest in one of South Africa's poorest provinces—nearly one in three households in the Eastern Cape experiences hunger. However, another of the poorest provinces—Limpopo—has a hunger prevalence rate of only 14.59%, the third lowest in the country. Meanwhile, Mpumalanga—with a poverty rate below the national average—has the second highest hunger prevalence rate in the country.

	% of households experiencing hunger
National	19.36%
Western Cape	10.41%
Eastern Cape	30.54%
Northern Cape	14.31%
Free State	23.33%
KwaZulu-Natal	19.01%
North West	20.89%
Gauteng	13.58%
Mpumalanga	28.79%
Limpopo	14.59%

Table 3.17: Prevalence of hunger in households

This study estimated four models to explain these variables, using the same set of explanatory variables employed for the education household expenditure analysis. The first two models focus on adult (and older child) hunger, first across all households and second with a sample limited to low income households. The second set of models analyses young child hunger, again first with all households and second with the sample restricted to low income households. These models focus on the State Old Age Pension because of its large rand value and high rate of take-up in the sample. The pension variables included in the model are the number of female and number of male pensioners in the household, providing an assessment of gender impacts. In addition, the study focuses on the interaction between geographical variables and the other key

determinants of hunger. In particular, income and education are critical variables that explain the prevalence of hunger across households. Likewise, the study included remittances, the age structure of the household, whether or not the household head was female, and a number of other control variables. The results of the regression models are reported in the table below.

Table 3.18: Social Security and hunger

	ADULT HUNGER		CHILD HUNGER	
	All Households	Lower Income households	All Households	Lower Income households
number of female pensioners	-0.042917 *	-0.039058 *	-0.058197 *	-0.053443 *
number of male pensioners	0.007888	0.009690	0.011313	0.022590
ln(household income per capita)	-0.126760 *	-0.138360 *	-0.136768 *	-0.154544 *
remittance received by household	-0.000003 *	-0.000004	-0.000004 *	-0.000007 *
(remittance received by household)Sq.	0.000000	0.000000	0.000000 *	0.000000
years of education attained by the household head	-0.002606	-0.003358	0.002712	0.002032
(years of education attained by household head)Sq.	0.000119	0.000387	-0.000293	0.000062
Number of children	-0.014512 *	-0.013609 *	-0.011798 *	-0.013852 *
Number of adult non-eligible for pension	-0.009606 *	-0.008355 *	-0.013076 *	-0.013151 *
Number of elderly	-0.064175 *	-0.071639 *	-0.063998 *	-0.080050 *
Age of the household head	0.000018	0.000278	-0.001152 *	-0.000904
(Age of the household head)Sq.	0.000001 *	0.000000	0.000002 *	0.000002 *
Female household head?	-0.043319 *	-0.054913 *	-0.039335 *	-0.049558 *
Rural?	-0.080881 *	-0.102689 *	-0.095141 *	-0.121840 *
Eastern Cape	-0.000003	-0.000006 *	0.000001	-0.000002
Northern Cape	-0.000003 *	-0.000004	-0.000003	-0.000007 *
Free State	-0.000017	-0.000007	-0.000016	-0.000001
KwaZulu_Natal	-0.000022 *	-0.000021	-0.000020 *	-0.000023
North West	0.155931 *	0.155372 *	0.117405 *	0.116337 *
Gautemg	0.043347 *	0.065695 *	0.018440	0.013767
Mpumalanga	-0.038539 *	-0.045628 *	-0.052409 *	-0.069282 *
Northern Province	-0.007515	0.001811	-0.051953 *	-0.068339
Predicted income x poverty	-0.103096 *	-0.104753 *	-0.111112 *	-0.126930 *
Poverty?	0.070091 *	0.058626 *	0.053501 *	0.049724 *

As is the case for the expenditure shares on food, there are great disparities between urban and rural areas and in different provinces with respect to the prevalence of hunger. The median income in rural areas is less than a half the median income in urban areas and the proportion of people living in poverty[33] is higher in rural areas than that in urban areas. Controlling for income and other explanatory variables, living in an urban area is significantly and positively associated with a higher probability of experiencing hunger. In the sample of low income households (those with income less than twice of the national median income), the effect of living in an urban area is associated with a 10.3 percentage point higher probability of having an adult or older child in the household experience hunger. The effect for young children is even higher—a 12.2 percentage point higher probability of experiencing hunger. This result is consistent with the findings from the household expenditure model that documented the extent to which households in rural areas spend a greater proportion of their income on food, after controlling for other explanatory variables. These findings document the importance of moving beyond measures of income poverty in the assessment of social deprivation.

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[33] For this discussion, poverty is defined as income per capita below R300 per month. Different poverty definitions will yield quantitatively different measures, but the qualitative implications are unchanged.

All four models above indicate significantly negative coefficients for the number of female pensioners in the household. The coefficients for the number of male pensioners are not significantly different from zero. The size of the impact of female pensioners is greater for children than for adults. An additional female pensioner in the household is associated with a 5.8% lower probability of a young child in the household experiencing hunger, and a 4.3% lower probability for adults and older children. (Restricting the sample to lower income households, an additional female pensioner in the household is associated with a 5.3% lower probability of a young child in the household experiencing hunger, and a 3.9% lower probability for adults and older children.) The consistent significance of female pensioners in the face or persistent statistical insignificance of male pensioners raises the question of the gender impact of social security receipt.

A gender decomposition of the pension effect on food expenditure shares and hunger demonstrates that the number of male pensioners is significantly associated with an increased household expenditure share on food but no impact in terms of reducing hunger. The number of female pensioners has the opposite correlation—significantly lower prevalence rates of hunger but no effect on food expenditure shares. These statistical results are consistent with the theory of the non-unitary household—in this case that increases in household expenditure shares on food do not necessarily benefit the nutritional status of all members in the household. In other words, male pensioners may be spending their pension income on food for themselves, rather than for other members of the household. Female pensioners, on the other hand, may allocate more resources to other household members, particularly young children.

Remittances are another income source that significantly reduces adult and child hunger. The quantitative impact is relatively small compared to the effect of female pensioners—an extra R100 of remittance income received by the household is associated with a 0.03% reduction in the probability of an adult or older child experiencing hunger. This effect is more than twice as strong for young children in low income households.

3.6) SOCIAL SECURITY AND HEALTH

The results of the expenditure model presented in the section 3.4 also provide some insights into the relationship between social security and the health status of household members. The household medical expenditure regressions are summarised in the table below, following the methodology previously employed. Two models are estimated—one which includes among the explanatory variables the rand amount of State Old Age Pension, and the other that includes the number of pensioners in the household. In addition, the models include indicators of whether or not the households receive the Child Support Grant or the Disability Grant. The model involves a two-stage process to control for the endogeneity of income—predicting income based on the exogenous variables in the model and using the predicted income to explain the medical shares of total expenditure. In addition, the study focuses on the interaction between

geographical variables and the other important determinants of medical expenditure, including education, the age structure of the household, gender and other control variables. The results of the regression models are reported in the table below.

Table 3.19: Medical expenses as a share of total spending

	Model 1 (number of pensioners)			Model 2 (pension amount)		
	coefficient	t-statistic		coefficient	t-statistic	
SOAP	-0.006347	-5.32	*	-0.009471	-5.74	*
Predicted income	0.000001	10.67	*	0.000001	10.62	*
Predicted income (squared)	0.000000	-4.02	*	0.000000	-4.04	*
Remittances to the household	-0.004843	-4.72	*	-0.004825	-4.70	*
education of household head	0.000914	4.43	*	0.000925	4.48	*
education of household head)Sq.	-0.000055	-4.27	*	-0.000056	-4.34	*
Age of the household head	0.000094	1.47		0.000104	1.63	
(Age of the household head)Sq.	0.000001	1.86	*	0.000001	1.84	
Child Support Grant?	-0.002425	-1.72	*	-0.002453	-1.74	*
Disability Grant?	0.001524	1.18		0.001457	1.13	
Number of children	0.001046	5.09	*	0.001065	5.18	*
Number eligible for pension	0.005406	7.42	*	0.005293	7.61	*
Household in poverty?	0.004536	3.26	*	0.004601	3.31	*
Rural?	-0.002776	-5.00	*	-0.002791	-5.03	*
degree	0.005456	3.88	*	0.005408	3.84	*
Eastern Cape	0.001434	1.26		0.001524	1.34	
Northern Cape	0.001078	0.83		0.001120	0.86	
Free State	-0.000502	-0.41		-0.000412	-0.33	
KwaZulu_Natal	-0.001113	-0.98		-0.001042	-0.92	
North West	-0.000674	-0.56		-0.000611	-0.51	
Gautemg	-0.005975	-5.32	*	-0.005915	-5.26	*
Mpumalanga	0.006573	5.24	*	0.006663	5.31	*
Northern Province	-0.003518	-2.90	*	-0.003464	-2.86	*
Constant term	-0.010210	-2.68	*	-0.010073	-2.63	*
SUMMARY STATISTICS:						
Observations	25523			25521		
F-statistic	97.81			97.96		
Significance	99.9%			99.9%		
R-squared	0.12			0.12		

The results of the medical expense share of total expenditure model yields robust results—the receipt of social grants is associated with significantly lower medical expenditure shares, controlling for the other explanatory variables. In some ways, this result is surprising—receipt of social grants is associated with higher expenditure and/or better outcomes with respect to nutrition, education, fuel, housing and household operations. Why are social grants associated with lower levels of medical spending? One possibility is that social grants promote a broader set of outcomes that promote health irrespective of direct household spending on medical care. For example, social grants promote better nutrition and education outcomes—both which are related to better health outcomes. The positive direct effects on health outcomes may make greater medical care expenditure unnecessary, and in fact promote a virtuous cycle whereby better health outcomes economise on household resources, supporting further allocations into long term investments (nutrition and education), with further dividends for health. This hypothesis is supported by the evidence from the regression models.

For instance, the number of people in the household eligible for the pension is positively associated with greater medical care expenditure. This is not surprising, since medical expenses tend to increase with age. However, the number of people receiving pensions is negatively associated with medical care expenditure. This is consistent with the finding that pension income supports positive health outcomes that reduce the necessity of medical care expenditure.

One important outcome may result from improved education, and the health implications may be substantial. Not only does increasing school attendance among poor children add to human capital, improving future productivity and prospects for economic growth; it also exerts an important long-term effect by stemming the spread of HIV/AIDS. The World Bank notes that increasing education, and in particular the education of women, is one of the most effective ways to combat the spread of HIV/AIDS:

> "An increased level of education provides young girls with earning power to enhance their economic independence, which may keep them from resorting to commercial sex work for economic survival, thereby reducing their risk of HIV infection. Education also provides girls with the confidence and the basic knowledge to make sound decisions about their sexual health, again reducing their risk of contracting HIV. Increased efforts in girls' education are needed now because young girls are disproportionately infected and affected by this epidemic and by the many other reproductive health problems they face, such as female genital mutilation and unwanted pregnancy. Not only are they being infected with HIV, they are being pulled out of school to care for sick relatives or assume family responsibilities as their parents die. Efforts to increase girls' education should take these problems into account and find solutions to them."[34]

3.7) OTHER SOCIAL INDICATORS

This study has focused on the relationship between social security and the main objectives of social investment—health, education and nutrition. In addition, the results of the expenditure model presented in the section 3.4 also provide insights into other indicators of well-being. For example, receipt of the Child Support Grant is associated with a lower household expenditure share on tobacco, even controlling for the number of children in the household. Likewise, receipt of social grants is associated with a lower household spending share on tobacco, alcohol and gambling. In addition, households that receive social grants have lower household indebtedness and smaller debt service burdens, controlling for household income and other explanatory variables. The positive implications of the household expenditure models are corroborated by direct tests of the relationship between social grants and social indicators, where data is available. For instance, the September 2000 Labour Force Survey captured a number of measures of household well-being related to access to water and sanitation. One important variable is the prevalence of piped water, measured in binary form with a value of one if the household has access to piped water. The table below presents the results of a regression of this measure on explanatory variables such as receipt of social

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[34] World Bank (1999).

grants, household income, the age and gender structure of the household and other control variables.

Table 3.20: Social Security and water piped into the household

Explanatory variable	Effect (coefficient)	standard error	student t-statistic	significance level
State Old Age Pension amount received	0.009260	0.000919	10.0700	0.0000
Years of education of household head	0.021867	0.000694	31.4900	0.0000
Receipt of Child Support Grant	-0.010256	0.015447	-0.6600	0.5070
Receipt of Disability Grant	0.023467	0.014097	1.6600	0.0960
Number of children	0.014144	0.003252	4.3500	0.0000
(Number of children)squared	-0.003433	0.000481	-7.1400	0.0000
Number of adults	0.035379	0.002026	17.4600	0.0000
Gender of household head	0.052507	0.005540	9.4800	0.0000
Constant term	-0.051157	0.007974	-6.4200	0.0000

The amount of State Old Age Pension received and the receipt of a Disability Grant are both significantly and positively associated with a higher probability of access to piped water into the household. The effect of the Child Support Grant is not statistically significantly different from zero. The summary statistics from the regression are presented in the table below. The F-statistic of 1014.17 documents the overall significance of the regression at a 99.9% level.

Table 3.21:Regression summary statistics

Number of observations	25584
F-statistic (overall significance)	1014.17
Significance of F-statistic	99.9%
R-squared (variance explained)	26.3%

3.8) CONCLUSIONS

The results of this study provide evidence that the household impact of South Africa's social grants are developmental in nature. These findings are consistent with international lessons of experience, as well as with previous studies of South Africa's system of social security. Social security programmes in Brazil, Argentina, Namibia and Botswana yield positive impacts in terms of reducing poverty, promoting job search and increasing school attendance. Past studies of social security in South Africa have focused on the State Old Age Pension, identifying important positive effects in terms of broadly reducing household poverty as well as improving health and nutrition.

Poverty and its associated consequences erode the opportunities for children and youth to attend school, fomenting a vicious cycle of destitution by undermining the household's capacity to accumulate the human capital necessary to break the poverty trap. The statistical evidence from this research documents the extent to which poverty exerts a negative impact on school enrolment rates. Many poor children cannot attend school due to the costs associated with education, including the necessity to work to supplement family income. In addition, communities that are resource-constrained provide lower quality educational services, which negatively affects enrolment rates. Social security grants counter these negative effects by providing households with more

resources to finance education. New findings from this study demonstrate that children in households that receive social grants are more likely to attend school, even when controlling for the effect of income. The positive effects of social security on education are greater for girls than for boys, helping to remedy gender disparities. But both the State Old Age Pension and the Child Support Grant are statistically significantly associated with improvements in school attendance, and the magnitudes of these impacts are substantial. This analysis only measures the direct and static link between social security and education.   To the extent that social grants promote school attendance, they contribute to a virtuous cycle with long term dynamic benefits that are not easily measured by statistical analysis.

Nationally, nearly one in five households experienced hunger during the year studied (2000). The highest income provinces—Gauteng and the Western Cape—have the lowest prevalence rates of hunger. The prevalence rate of hunger is highest in one of South Africa's poorest provinces—nearly one in three households in the Eastern Cape experiences hunger. However, another of the poorest provinces—Limpopo—has the third lowest hunger prevalence rate in the country. Meanwhile, Mpumalanga—with a poverty rate below the national average—has the second highest hunger prevalence rate in the country. Social grants are effective in addressing this problem of hunger, as well as basic needs in general. Spending in households that receive social grants focuses more on basics like food, fuel, housing and household operations, and less is spent on tobacco and debt. All major social grants—the State Old Age Pension, the Child Support Grant and the Disability Grant—are significantly and positively associated with a greater share of household expenditure on food. This increased spending on food is associated with better nutritional outcomes.   Households that receive social grants have lower prevalence rates of hunger for young children as well as older children and adults, even compared to those households with comparable income levels.

Receipt of social grants is associated with lower spending on health care, perhaps because social grants are associated with other positive outcomes that reduce the need for medical care. For instance, the World Bank identifies the important link between improved education and stemming the spread of HIV/AIDS. Likewise, social grants are associated with greater household access to piped water. The evidence in this chapter underscores the importance of moving beyond measures of income poverty in the assessment of social deprivation. In case after case in this study, household outcomes conflicted with the simple implications of monetary income rankings. While many measures of well-being are correlated with aggregate income and expenditure, the exceptions affect large numbers of people and require careful policy analysis. The interaction between social security and household well-being is complex, and further research continues to explore these interactions. In particular, the broad measures of household well-being analysed in this chapter exert profound effects on labour productivity and the ability of workers to find jobs. Employment in turn provides access to resources that promote improved education, nutrition, health and other outcomes. The next chapter explores these issues in greater detail.

CHAPTER 4)
The Labour Market Impact of Social Assistance Programmes

4.1) INTRODUCTION

This chapter evaluates the impact of South Africa's social development grants on labour market activity, identifying theoretically and empirically the impact of the social security programmes in terms of labour demand and supply. This research builds on the household impact assessment in the previous chapter, quantifying those factors that affect worker productivity and consequently employer demand for labour. In addition, the study assesses the incentive effects of social grants and their impact on labour force participation. Taken together, these two dimensions of the analysis provide evidence identifying the net impact of social grants on job creation in South Africa.

This chapter consists of four major sections. The first section (4.2) examines the theoretical and empirical literature on linkages between social security and labour markets, with a specific focus on South African evidence. The second section of the chapter (4.3) analyses the labour supply effects resulting from social development grants. Section 4.4 analyses the demand side of the labour market, evaluating the impact of social grants on wages and implicitly the productivity of labour. The final section (4.5) evaluates and summarises the policy implications of the findings.

4.2) LITERATURE REVIEW

Bhorat and Leibbrandt (2001) provide an excellent analysis of the broad issues affecting poverty and the South African labour market. They examine the question of the voluntary versus involuntary nature of unemployment: are the unemployed jobless because they prefer to consume additional leisure in favour of taking a job at the market wage, or are they willing to work at the market wage but unable to find employment. Evidence documents the involuntary nature of unemployment in South Africa. Kingdon and Knight (2000) find little support for the classification of most South African unemployment as voluntary, as the unemployed are substantially worse off than even the informally employed on a broad range of indicators, including income and well-being. They hypothesise that there are barriers to entry to the informal or self-employment sector (whose participants are significantly more satisfied with the quality of their lives).

There also continues to be a debate over the appropriate definition for labour force participation (and therefore, unemployment rates). There are two competing definitions of labour force participation, broad and narrow. The narrow definition of participation excludes discouraged workers—those that would accept a job if offered but do not engage in active search.

Conventional wisdom on the labour market impact of South Africa's social grants is heavily influenced by the perceived experiences of industrialised countries. Relevant

research, however, often contradicts this "wisdom". Rees (1974) analyses the standard theory of labour supply in the context of a Negative Income Tax (guaranteed income) experiment run in the United States. The effect of a social assistance programme or a tax scheme on labour supply can be decomposed into two effects: an income effect and an incentive (or substitution) effect. The amount of hours a person works will depend on one's income from other sources. The income effect is the change in labour supply due to the change in income. Leisure, defined as any non-work activity, is generally considered a normal good, meaning that as one's income rises, fewer hours are worked, as one can now afford to "purchase" additional leisure time. The incentive effect is the change in labour supply resulting from a change in the actual wage available to a worker, that is, the marginal benefit to the worker of working an additional hour. An increase in the tax rate reduces the actual wage a worker receives, reducing the relative price of leisure, which leads to its substitution for monetary income. If the amount received from a social grant (or any other source) is reduced as one's income increases, this constitutes an effective tax on labour supply. The sum of the income and the incentive effects yields the net effect on labour supply.

However, the empirical evidence regarding the labour supply of very low-income households is ambiguous. Because intra-household transfers from social grant recipients to other household members may decrease as other household members receive more income, the effect of social assistance programmes can be evaluated in the context of negative income tax experiments, whose labour supply effects have been extensively studied. In a U.S. negative income tax experiment, Rees (1974) found the absence of any negative effect on the labour supply of black households, and a small but significant effect for other racial groups.

Other research has also shown that the labour supply of low-income households may not be negatively affected by exogenous income changes. Imbens, Rubin, and Sacerdote (1999) conducted a study of the effect of unearned income on labour supply by examining lottery players in the U.S. They found that while very large changes in unearned income (greater than $15,000 per year) reduces labour supply, there was little or no evidence that smaller amounts had a negative effect on labour supply. They also found weak evidence that those with zero earnings prior to winning a modest amount actually increased their subsequent labour force participation.

Bertrand, Miller, and Mullainathan (2000) analysed the impact of South Africa's State Old Age Pension (SOAP) programme on labour supply by examining three-generation households (households with grandparents, parents and children). They theorised that pension benefits may be redistributed within a household, reducing labour supply via an income and possibly an incentive effect. If the transfer from the pensioner to the worker(s) in the household occurs as a lump-sum transfer, there is no change in the incentives the worker faces. Given the assumption that leisure is a normal good

(whose demand increases with income), this increase in income would reduce the amount of time spent on work or job search. They also theorised that pension transfers may have an incentive effect. Pension transfers to an individual may decrease as he or she earns more, either because pensioners wish to insure other members against negative shocks or because individuals who work less can bargain more successfully with pensioners. In this case, variable pension transfers create a tax effect, as a worker would lose some amount of pension money for each additional rand earned. The magnitude of this incentive effect would vary negatively with the amount of altruism the recipient felt toward the pensioner(s), since an altruistic recipient would be motivated by one's own consumption as well as that of the pensioner. Bertrand, Miller, and Mullainathan hypothesise that the closeness of blood relation to the pensioner can serve as a proxy for the level of altruism associated with the transfer.

This study finds a drop in the labour force participation of prime-age men living in households that receive pensions. The magnitude of the effect is relatively small: they estimate that a 10 percent rise in income (equivalent to 94 rand) is associated with a 2.8 percentage point drop in labour supply. They also find weak evidence that the reduction in labour supply is a result of disincentive effects, rather than from a pure income effect: the employment of in-laws is reduced more significantly than the employment of men blood-related to the pensioners. In addition, they find that the power structure within the family has a significant effect on labour force participation outcome: while male labour supply is reduced, female labour supply is unaffected by living with pension beneficiaries.

Bhorat and Leibbrandt (2001) examine four representative studies of the South African labour market and identify in them a number of shortcomings in methodology. Bhorat and Leibbrandt sequentially model three stages of the labour market: participation probability, employment probability, and an earnings function. They use the Heckman selection model (Heckman 1979) to correct for the sample selection bias that results from having data only on a non-randomly selected sample in the employment probability and earnings function stages of their model.

Klasen and Woolard (2000) examine the effects of household formation on the labour market in South Africa. They conclude that the absence of an effective unemployment insurance system affects household formation because unemployed individuals make household affiliation decisions in order to ensure access to resources. In particular, unemployment leads young people to delay setting up independent households and causes the dissolution of existing households, with their members returning to the households of their parents, relatives, or friends. Access to state transfers, and state old age pensions in particular, increases the probability that

unemployed persons will be attracted to a household. Klasen and Woolard hold that this household formation response can provide a partial explanation for high rural unemployment: unemployed individuals move to rural areas for the economic support they can receive there, rather than for the limited labour market opportunities. A simple correlation between pension receipts and low labour force participation reflects a poverty coping mechanism, not the effect of social grants on reducing labour supply.

Klasen and Woolard investigate how the economic support a household receives affects its labour market behaviour. They estimate a three stage model predicting the share of adults in a household who are in the broad labour force, the share of those in the broad labour force who are also in the narrow labour force, and the share of those in the narrow labour force who are employed. They find that remittance income, pension, and non-wage private income in the household are correlated with lower labour force participation, search activities, and employment prospects of adult household members, with the strongest impact being on search activities.

Klasen and Woolard note that these findings have two possible interpretations: they could show either that pension, remittance, and non-wage private income raise the reservation wage, or that unemployed people attach themselves to households with these income sources. If these households are in rural areas with high search costs or lower employment prospects, search activities might be reduced. Given the documented endogeneity of household formation, they suggest the latter interpretation is more likely. Klasen and Woolard also examine the determinants of reservation wages of the unemployed, and find that self-employment income and private income raise reservation wages, while pension and remittance incomes do not.

The evidence from the international and South African literature on the relationship between social security and labour markets is inconclusive. Some research supports the conventional wisdom that social grants create adverse incentive effects, but substantial evidence contradicts this notion. In particular, many findings support the hypothesis that social grants may affect the poorest households differently, with grants potentially supporting increased access to employment opportunities. In general, however, to the extent that there are adverse consequences, these result from distortions in targeting mechanisms. For instance, targeting the poor in general through social grants for pensioners may lead to household formation responses that undermine job search. A broader-based and more comprehensive social security programme might avoid these negative effects.

4.3) SOCIAL SECURITY AND LABOUR SUPPLY

This section evaluates the impact of South Africa's social security programme on the supply of labour by individuals and households.

METHODOLOGY

Statistics South Africa data from the September 2000, 2001, and 2002 *Labour Force Survey*s and the 2000 *Income and Expenditure Survey* support the use of both cross-section and panel models. Each model has advantages and disadvantages in terms of data richness and effectiveness in controlling for statistical problems. The cross-section models follow the standard approach of setting up a sequential model of individuals in the labour market, with selection into participation, and then into employment. Because household formation is endogenous to labour force status and wages earned (individuals with low or no wages are less likely to set up independent households), the effect of household-level characteristics (such as social grant receipt) on these variables cannot be most efficiently assessed with a cross section model. Pensions, in this case, might be associated with unemployment or lower wages not because pensions have a negative effect on wages, but because individuals who make low or no wages are more likely to move to a household that receives pensions. The panel model can control to some extent for this effect, by examining households who receive social grants at a given point in time, and then modelling the evolution of labour market outcomes in those households, compared to households that are not receiving social grants.

An important explanatory variable—the household's overall income—is endogenous to labour force participation decisions. Using a household's reported income to explain labour force decisions may produce biased results, as these labour force decisions may also explain household income; household income and labour force decisions may be simultaneously determined. However, the concept of a household's "earning power" may be viewed as largely insulated from labour force participation decisions and may be used to explain these decisions. Because a household's earning power is not directly observable, however, it is necessary to predict it employing other observable characteristics, including demographic and educational characteristics. Linking the household data from the September 2000 LFS to that of the 2000 IES provides a basis for formalising this concept of "earning power", by regressing specifications of household income (including linear and log forms, and excluding social grants) against explanatory variables consisting of household characteristics. These models then can predict an income variable that controls for the simultaneity bias. (See the appendix for the regression results.) This procedure cannot be applied directly to the September 2001 and 2002 LFS samples, however, because these surveys do not include complete measures of household income. However, the models developed for 2000 can be applied against the explanatory variables in subsequent *Labour Force Survey*s to identify measures of earning power. The study employed the model from the

LFS 2000 data to predict an income value for households in the September 2001 and 2002 LFS samples.[35]

The panel model uses Labour Force Survey data to analyse the effects of social grants on labour force participation, employment and productivity (reflected by wages). The study constructs representative households for each primary sampling unit (PSUs), each comprising an average of 10 households, and creates variables for each PSU's demographic, employment, and social grant receipt characteristics in a given year. Among these variables are the percent of households in the PSU that received each social grant, the average size of a household, the average number of females per household, and the average number of children within each household. For employment the variables include the percent of people of working age, the percent not attending an educational institution, the share of the household in each employment category (employed, in the narrow labour force, in the broad labour force) for each PSU in each year. In the second formulation, the study analyses the share of people of working age, non school population in the broad labour force ("share in the broad labour force"), the share of people in the broad labour force who are also in the narrow labour force ("share of broad in narrow"), and the share of the narrow labour force that is employed ("share of narrow employed"). This latter formulation has the advantage of being able to determine at what stage pensions have an effect on individuals.

The cross-sectional model employed a probit regression to predict an individual's probability of participation in the broad labour force. The use of the probit model is preferred to Ordinary Least Squares because the dependent variables are dichotomous, not continuous variables: a given individual either participates in the narrow labour force by meeting the qualifications for that status or does not meet those qualifications and is therefore considered not participating in the narrow labour force. The probit model guarantees that the probabilities it estimates are between zero and one, which are the boundaries for a well-defined probability measure. For ease of interpretation, the OLS coefficients are also reported, noting where they significantly differ from the coefficients estimated by the probit model.

In the second stage of the cross-sectional model, the analysis predicts an individual's probability of participation in the narrow labour force, given his or her participation in the broad labour force, using a maximum-likelihood probit estimation with sample selection correction (Heckman 1979; Van de Ven and Van Pragg 1981)[36].

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[15] This study estimated a regression against linear as well as logarithmic income for a sample of low-income households (yearly income under R17840) and used its results to predict an alternative income amount. Differences in specifications had no significant effect on the results.

[16] The MLE probit estimation with sample selection is significantly more computationally intensive than the Heckman two stage sample correction procedure, but is also more theoretically appropriate for this type of estimation.

Finally, using the same MLE probit method, the model predicts an individual's probability of employment, given participation in the narrow labour force.

This sample selection correction procedure is useful to more accurately assess a particular variable's effects on the given stage of participation or employment. Because the stages are sequential, if no sample selection correction were used, the estimated coefficient on a variable for a given stage might be contaminated by its effects on all previous stages. For a hypothetical example, consider wealth: extremely high levels of wealth may reduce an individual's probability of participation in the labour market while increasing the probability of getting a job if he or she sought one. Without the sample selection correction procedure, one could (hypothetically) estimate wealth having a negative effect on employment solely because of its negative effect on participation.

The household cross-sectional model follows in part the methodology of Klasen and Woolard, predicting the share of adults in a household who report to be in the broad labour force, the share of those in the broad labour force who are also in the narrow labour force, and the share of those in the narrow labour force who are employed. In each step, excluding the first, the study uses the same MLE probit with sample selection used in the individual cross sectional framework, including dummies for receipt of pension and receipt of remittance income[37] as explanatory variables, and (unlike Klasen and Woolard) also controlling for the household's pension age eligibility in the regression.

PANEL DATA ESTIMATES
NARROW LABOUR FORCE PARTICIPATION

The first set of panel data estimates addressed the question of narrow labour force participation, using the official Statistics South Africa definition that excludes discouraged workers. The model incorporates explanatory variables for both the State Old Age Pension (SOAP) and the Disability Grant (DG). The Child Support Grant (CSG) did not enter significantly into the participation regressions, perhaps due to the relatively small size of the grant during the sample period, and its low take-up rate in September 2001. In addition, to control for the impact of demographic characteristics, age and gender related variables were included, including the number of age-eligible pensioners (both those receiving and not receiving the SOAP). In addition, changes in household composition were incorporated into the model through variables reflecting the change in the number of children, the change in the number of women and the change in

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[17] Klasen and Woolard use the existence of an absent household member as an instrument for remittance income, as both remittance receipt and labour market behaviour are simultaneously determined. However, the choice of a household member to migrate is also endogenous to these choices.

household size overall. Provincial binary (dummy) variables and a variable to capture the rural effect were also included. Table 4.1 below presents the results of a two-stage least squares regression, with predicted income estimated in the first stage.

Table 4.1: LFS participation model 1

	effect (coefficient)	standard error	student t-statistic	significance level	
Exogenous estimated income	-0.00002	0.00001	-2.79000	0.00500	***
receipt of old age pension	0.12775	0.03664	3.49000	0.00000	***
Eligibility for old age pension	-0.03780	0.02635	-1.43000	0.15100	
receipt of disability grant	0.22290	0.04831	4.61000	0.00000	***
change in number of children	-0.03601	0.00511	-7.05000	0.00000	***
change in number of adult women	-0.08237	0.01202	-6.85000	0.00000	***
change in household size	0.03116	0.00926	3.37000	0.00100	***
Household members aged 26 to 35	-0.01394	0.01357	-1.03000	0.30400	
Eastern Cape	-0.08675	0.02824	-3.07000	0.00200	***
Northern Cape	-0.07013	0.02868	-2.45000	0.01500	**
Free State	-0.06832	0.02708	-2.52000	0.01200	**
KwaZulu-Natal	-0.01100	0.02120	-0.52000	0.60400	
Northwest	-0.04813	0.02299	-2.09000	0.03600	**
Gauteng	-0.03878	0.01727	-2.25000	0.02500	**
Mpumalanga	-0.05085	0.01911	-2.66000	0.00800	***
Limpopo	-0.09660	0.02464	-3.92000	0.00000	***
Rural	-0.02129	0.01008	-2.11000	0.03500	**
Constant term	0.14774	0.05730	2.58000	0.01000	**

Both the State Old Age Pension and the Disability Grant have a significantly positive impact on narrowly defined labour force participation. Increases in the share of the household made up by women or children significantly reduce narrow labour force participation, consistent with the hypothesis that childcare responsibilities compete with remunerative work in a manner that disproportionately affects women. The geographical variables were significant in nearly all cases, reflecting the significant provincial disparities in labour markets. Likewise, labour force participation was significantly lower in rural areas compared to urban areas. Table 4.2 below summarises key statistics from the regression model. The F-statistic of 16.94 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.2: LFS participation model 1 summary statistics

Number of observations	2922
F-statistic for overall model	16.94
Significance of model	99.9%
R-squared	0.0902
Adjusted R-squared	0.0849

An alternative specification of the two-stage least squares model was tested which incorporated an explanatory variable reflecting the gender composition of the household. The results of this specification are reported in table 4.3 below.

Table 4.3: LFS participation model 2

	effect (coefficient)	Standard error	student t-statistic	significance level	
Exogenous estimated income	-0.00002	0.00001	-2.96000	0.00300	***
receipt of old age pension	0.13834	0.03735	3.70000	0.00000	***
Eligibility for old age pension	-0.05809	0.02687	-2.16000	0.03100	**
receipt of disability grant	0.22124	0.04870	4.54000	0.00000	***
change in number of children	-0.03614	0.00517	-6.98000	0.00000	***
change in number of adult women	-0.07523	0.01315	-5.72000	0.00000	***
change in household size	0.02959	0.00963	3.07000	0.00200	***
Household members aged 26 to 35	-0.01621	0.01382	-1.17000	0.24100	
Eastern Cape	-0.09532	0.02903	-3.28000	0.00100	***
Northern Cape	-0.07684	0.02938	-2.62000	0.00900	***
Free State	-0.07451	0.02779	-2.68000	0.00700	***
KwaZulu-Natal	-0.01746	0.02169	-0.81000	0.42100	
Northwest	-0.05060	0.02353	-2.15000	0.03200	**
Gauteng	-0.03859	0.01757	-2.20000	0.02800	**
Mpumalanga	-0.05363	0.01942	-2.76000	0.00600	***
Limpopo	-0.10916	0.02530	-4.31000	0.00000	***
Rural	-0.02095	0.01033	-2.03000	0.04300	**
Constant term	0.17256	0.05979	2.89000	0.00400	***
male-to-female ratio	-0.00607	0.00455	-1.33000	0.18200	

The impact of the ratio of male to female household members, reflecting gender composition, was not significantly different from zero.   The impact of the other explanatory variables was robust to the change in model specification. The summary statistics from this regression are reported in table 4.4 below. The F-statistic of 14.66 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.4: LFS participation model 2 summary statistics

Number of observations	2829
F-statistic for overall model	14.66
Significance of model	99.9%
R-squared	0.0858
Adjusted R-squared	0.0800

In order to further test the robustness of the results, a third specification was tested using Ordinary Least Squares estimation for the set of explanatory variables employed in the original regression (model 1). In order to test this specification, the instrumental variable for income was omitted from the regression.   The results are presented below in table 4.5.

Table 4.5: LFS participation model 3

	effect (coefficient)	standard error	student t-statistic	significance level	
receipt of old age pension	0.14765	0.03576	4.13000	0.00000	***
Eligibility for old age pension	-0.03636	0.02641	-1.38000	0.16900	
receipt of disability grant	0.22103	0.04840	4.57000	0.00000	***
change in number of children	-0.03283	0.00548	-6.00000	0.00000	***
change in number of adult women	-0.08119	0.01204	-6.75000	0.00000	***
change in household size	0.03171	0.00928	3.42000	0.00100	***
Household members aged 26 to 35	-0.02780	0.01382	-2.01000	0.04400	**
Eastern Cape	-0.02260	0.01548	-1.46000	0.14400	
Northern Cape	-0.01234	0.01990	-0.62000	0.53500	
Free State	-0.00756	0.01672	-0.45000	0.65100	
KwaZulu-Natal	0.03018	0.01492	2.02000	0.04300	**
Northwest	-0.00228	0.01641	-0.14000	0.88900	
Gauteng	-0.01330	0.01489	-0.89000	0.37200	
Mpumalanga	-0.02715	0.01694	-1.60000	0.10900	
Limpopo	-0.04645	0.01641	-2.83000	0.00500	***
Rural	-0.00932	0.00881	-1.06000	0.29000	
Constant term	-0.00332	0.01819	-0.18000	0.85500	
children under 7 years of age	0.01663	0.01217	1.37000	0.17200	

The results are not significantly different than from the previous two specifications. Receipt of both the State Old Age Pension and the Disability Grant has a positive effect on the increase in narrow labour force participation. The magnitude of the impact is not significantly different from the magnitudes in the previously estimated two-stage least square models. Likewise, the other explanatory variables have similar effects in both versions of the model. Not surprising, the share of household members aged 26 to 35 is significantly negative in the ordinary least squares model but not in the two-stage least squares model. This counter-theoretical result likely reflects the simultaneity bias that the two-stage least squares model corrects. The key summary statistics for the regression are reported in table 4.6 below. The F-statistic of 16.55 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.6: LFS participation model 3 summary statistics

Number of observations	2922
F-statistic for overall model	16.55
Significance of model	99.9%
R-squared	0.0883
Adjusted R-squared	0.0830

A final test of robustness involved a fourth specification, tested using Ordinary Least Squares estimation for the set of explanatory variables employed in the second regression (model 2). Like in model 3 above, the instrumental variable for income was omitted from the regression. This alternative specification of the Ordinary Least Squares

model incorporated an explanatory variable reflecting the gender composition of the household.   The results are presented below in table 4.7.

Table 4.7: LFS participation model 4

	effect (coefficient)	Standard error	student t-statistic	significance level	
receipt of old age pension	0.16714	0.03611	4.63000	0.00000	***
Eligibility for old age pension	-0.05714	0.02690	-2.12000	0.03400	**
receipt of disability grant	0.22330	0.04876	4.58000	0.00000	***
change in number of children	-0.03562	0.00518	-6.88000	0.00000	***
change in number of adult women	-0.07593	0.01317	-5.77000	0.00000	***
change in household size	0.03200	0.00961	3.33000	0.00100	***
Household members aged 26 to 35	-0.02457	0.01355	-1.81000	0.07000	*
Eastern Cape	-0.02275	0.01554	-1.46000	0.14300	
Northern Cape	-0.01392	0.02029	-0.69000	0.49300	
Free State	-0.00980	0.01715	-0.57000	0.56800	
KwaZulu-Natal	0.02871	0.01507	1.90000	0.05700	*
Northwest	-0.00164	0.01674	-0.10000	0.92200	
Gauteng	-0.01252	0.01522	-0.82000	0.41100	
Mpumalanga	-0.02671	0.01718	-1.55000	0.12000	
Limpopo	-0.05265	0.01660	-3.17000	0.00200	***
Rural	-0.00409	0.00863	-0.47000	0.63600	
Constant term	0.00501	0.01914	0.26000	0.79400	
male-to-female ratio	-0.00566	0.00455	-1.24000	0.21400	

Like in the second regression (model 2), the impact of the ratio of male to female household members, reflecting gender composition, was not significantly different from zero. The impact of the other explanatory variables was robust to the change in model specification. Again, receipt of the State Old Age Pension and the Disability Grant have a significantly positive impact on narrow labour force participation.   The summary statistics from this regression are reported in table 4.8 below. The F-statistic of 14.96 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.8: LFS participation model 4 summary statistics

Number of observations	2829
F-statistic for overall model	14.96
Significance of model	99.9%
R-squared	0.0830
Adjusted R-squared	0.0774

The results of all four narrow labour participation regression models are summarised in table 4.9 below. Regardless of estimation technique (ordinary least squares or two-stage least squares) and model specification, the two key effects tested by this model are corroborated by all four models: both receipt of the State Old Age Pension and the Disability Grant have a significant positive impact on narrow labour force participation. Depending on the model, households receiving the State Old Age Pension have narrow labour force participation rates 13 to 17 percentage points higher than households that do not receive the grant. Likewise, households receiving the

Disability Grant have participation rates 22 percentage points higher. Households receiving both grants have participation rates 35 to 39 percentage points higher. The results are not significantly different across models.

Other explanatory variables have reasonable effects consistent with economic theory. Estimated exogenous income has a negative impact on narrow labour force participation—workers in households with sufficiently high incomes tend to withdraw from the labour force. Eligibility for the State Old Age Pension (in the absence of actual receipt of the grant) has a negative effect on household labour force participation. This effect, however, is only statistically significant when controlling for the gender composition of the household. Age composition of the household is consistently statistically significant. The rural/urban distinction is statistically significant only with the two-stage model that corrects for the simultaneity bias. Likewise, the geographical variables are more significant in these corrected models.

Summary Table 4.9: LFS participation models 1 – 4

LFS status 1 participation rates	two-stage models				Ordinary least squares			
	LFS participation model 1		LFS participation model 2		LFS participation model 3		LFS participation model 4	
Exogenous estimated income	-0.00002	***	-0.00002	***				
receipt of old age pension	0.12775	***	0.13834	***	0.14765	***	0.16714	***
Eligibility for old age pension	-0.03780		-0.05809	**	-0.03636		-0.05714	**
receipt of disability grant	0.22290	***	0.22124	***	0.22103	***	0.22330	***
change in number of children	-0.03601	***	-0.03614	***	-0.03283	***	-0.03562	***
change in number of adult women	-0.08237	***	-0.07523	***	-0.08119	***	-0.07593	***
change in household size	0.03116	***	0.02959	***	0.03171	***	0.03200	***
Household members aged 26 to 35	-0.01394		-0.01621		-0.02780	**	-0.02457	*
Eastern Cape	-0.08675	***	-0.09532	***	-0.02260		-0.02275	
Northern Cape	-0.07013	**	-0.07684	***	-0.01234		-0.01392	
Free State	-0.06832	**	-0.07451	***	-0.00756		-0.00980	
KwaZulu-Natal	-0.01100		-0.01746		0.03018	**	0.02871	*
Northwest	-0.04813	**	-0.05060	**	-0.00228		-0.00164	
Gauteng	-0.03878	**	-0.03859	**	-0.01330		-0.01252	
Mpumalanga	-0.05085	***	-0.05363	***	-0.02715		-0.02671	
Limpopo	-0.09660	***	-0.10916	***	-0.04645	***	-0.05265	***
Rural	-0.02129	**	-0.02095	**	-0.00932		-0.00409	
Constant term	0.14774	**	0.17256	***	-0.00332		0.00501	
male-to-female ratio			-0.00607				-0.00566	
F-statistic (overall significance)	16.94000	***	14.66000	***	16.55000	***	14.96000	***

BROAD LABOUR FORCE PARTICIPATION

The second set of panel data estimates addressed the question of broad labour force participation, using the expanded Statistics South Africa definition that includes discouraged workers. As with the previous analysis, the models incorporate explanatory variables for both the State Old Age Pension (SOAP) and the Disability Grant (DG). Again, the Child Support Grant (CSG) did not enter significantly into the

participation regressions. In addition, the same demographic control variables used in the narrow participation models are employed in these regressions. Similarly, provincial binary (dummy) variables and a variable to capture the rural effect are also included. Table 4.10 below presents the results of a two-stage least squares regression, with predicted income estimated in the first stage.

Table 4.10: LFS participation model 5

	effect (coefficient)	standard error	student t-statistic	Significance level	
Exogenous estimated income	0.00000	0.00000	1.00000	0.31600	
receipt of old age pension	0.11512	0.02784	4.14000	0.00000	***
Eligibility for old age pension	-0.02994	0.02002	-1.50000	0.13500	
receipt of disability grant	0.25240	0.03670	6.88000	0.00000	***
change in number of children	-0.00848	0.00388	-2.19000	0.02900	**
change in number of adult women	-0.04046	0.00913	-4.43000	0.00000	***
change in household size	0.02274	0.00703	3.23000	0.00100	***
Household members aged 26 to 35	-0.04043	0.01031	-3.92000	0.00000	***
Eastern Cape	0.00926	0.02145	0.43000	0.66600	
Northern Cape	0.01543	0.02178	0.71000	0.47900	
Free State	0.02353	0.02057	1.14000	0.25300	
KwaZulu-Natal	0.04327	0.01610	2.69000	0.00700	***
Northwest	0.00548	0.01747	0.31000	0.75400	
Gauteng	0.02831	0.01312	2.16000	0.03100	**
Mpumalanga	0.01488	0.01452	1.03000	0.30500	
Limpopo	0.02926	0.01872	1.56000	0.11800	
Rural	0.00535	0.00766	0.70000	0.48500	
Constant term	-0.06310	0.04353	-1.45000	0.14700	

Both the State Old Age Pension and the Disability Grant have a significantly positive impact on broadly defined labour force participation. Increases in the share of the household made up by women or children significantly reduce broad labour force participation. Again, this is consistent with the hypothesis that childcare responsibilities compete with remunerative work in a manner that disproportionately affects women. The household composition variables are all statistically significant. Table 4.11 below summarises key statistics from the regression model. The F-statistic of 9.27 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.11: LFS participation model 5 summary statistics

Number of observations	2922
F-statistic for overall model	9.27
Significance of model	99.9%
R-squared	0.0515
Adjusted R-squared	0.0459

Like with the analysis of narrow participation, an alternative specification of the two-stage least squares model was tested which incorporated an explanatory variable

reflecting the gender composition of the household. The results of this specification are reported in table 4.12 below.

Table 4.12: LFS participation model 6

	effect (coefficient)	standard error	student t-statistic	significance level	
Exogenous estimated income	0.00000	0.00000	0.70000	0.48400	
receipt of old age pension	0.12397	0.02829	4.38000	0.00000	***
Eligibility for old age pension	-0.04721	0.02035	-2.32000	0.02000	**
receipt of disability grant	0.25326	0.03689	6.86000	0.00000	***
change in number of children	-0.00824	0.00392	-2.10000	0.03600	**
change in number of adult women	-0.03480	0.00996	-3.49000	0.00000	***
change in household size	0.02196	0.00729	3.01000	0.00300	***
Household members aged 26 to 35	-0.04130	0.01047	-3.94000	0.00000	***
Eastern Cape	0.00275	0.02199	0.13000	0.90000	
Northern Cape	0.00896	0.02226	0.40000	0.68700	
Free State	0.01766	0.02105	0.84000	0.40100	
KwaZulu-Natal	0.03796	0.01643	2.31000	0.02100	**
Northwest	0.00174	0.01782	0.10000	0.92200	
Gauteng	0.02917	0.01331	2.19000	0.02800	**
Mpumalanga	0.01259	0.01471	0.86000	0.39200	
Limpopo	0.02005	0.01916	1.05000	0.29600	
Rural	0.00617	0.00783	0.79000	0.43100	
Constant term	-0.04749	0.04529	-1.05000	0.29400	
male-to-female ratio	-0.00173	0.00344	-0.50000	0.61500	

The impact of the ratio of male to female household members, reflecting gender composition, was again not significantly different from zero. The impact of the other explanatory variables was robust to the change in model specification. The summary statistics from this regression are reported in table 4.13 below. The F-statistic of 7.99 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.13: LFS participation model 6 summary statistics

Number of observations	2829
F-statistic for overall model	7.99
Significance of model	99.9%
R-squared	0.0487
Adjusted R-squared	0.0426

In order to further test the robustness of the results, a third specification was tested using Ordinary Least Squares estimation for the set of explanatory variables employed in the original regression (model 5). In order to test this specification, the instrumental variable for income was omitted from the regression. The results are presented below in table 4.14.

Table 4.14: LFS participation model 7

	effect (coefficient)	standard error	student t-statistic	significance level	
receipt of old age pension	0.10580	0.02714	3.90000	0.00000	***
Eligibility for old age pension	-0.02925	0.02004	-1.46000	0.14500	
receipt of disability grant	0.25120	0.03674	6.84000	0.00000	***
change in number of children	-0.00767	0.00416	-1.85000	0.06500	*
change in number of adult women	-0.04049	0.00913	-4.43000	0.00000	***
change in household size	0.02189	0.00705	3.11000	0.00200	***
Household members aged 26 to 35	-0.04002	0.01049	-3.81000	0.00000	***
Eastern Cape	-0.00947	0.01175	-0.81000	0.42100	
Northern Cape	-0.00029	0.01511	-0.02000	0.98500	
Free State	0.00769	0.01269	0.61000	0.54400	
KwaZulu-Natal	0.03143	0.01132	2.78000	0.00600	***
Northwest	-0.00655	0.01245	-0.53000	0.59900	
Gauteng	0.02192	0.01130	1.94000	0.05300	*
Mpumalanga	0.00767	0.01286	0.60000	0.55100	
Limpopo	0.01477	0.01245	1.19000	0.23600	
Rural	-0.00017	0.00668	-0.03000	0.97900	
Constant term	-0.02143	0.01380	-1.55000	0.12100	
children under 7 years of age	0.00581	0.00924	0.63000	0.52900	

The results are not significantly different than from the previous two specifications. Receipt of both the State Old Age Pension and the Disability Grant has a positive effect on the increase in broad labour force participation, just as in the case of narrow labour force participation. The magnitude of the impact is not significantly different from the magnitudes in the previously estimated two-stage least square models. Likewise, the other explanatory variables have similar effects in both versions of the model. The key summary statistics for the regression are reported in table 4.15 below. The F-statistic of 9.23 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.15: LFS participation model 7 summary statistics

Number of observations	2922
F-statistic for overall model	9.23
Significance of model	99.9%
R-squared	0.0513
Adjusted R-squared	0.0457

A final test of robustness involved a fourth specification, tested using Ordinary Least Squares estimation for the set of explanatory variables employed in the second broad labour force participation regression (model 6). Like in model 7 above, the instrumental variable for income was omitted from the regression. This alternative specification of the Ordinary Least Squares model incorporated an explanatory variable reflecting the gender composition of the household. The results are presented below in table 4.16.

Table 4.16: LFS participation model 8

	effect (coefficient)	Standard error	student t-statistic	Significance level	
receipt of old age pension	0.11881	0.02731	4.35000	0.00000	***
Eligibility for old age pension	-0.04738	0.02035	-2.33000	0.02000	**
receipt of disability grant	0.25289	0.03688	6.86000	0.00000	***
change in number of children	-0.00833	0.00392	-2.13000	0.03300	**
change in number of adult women	-0.03468	0.00996	-3.48000	0.00100	***
change in household size	0.02153	0.00727	2.96000	0.00300	***
Household members aged 26 to 35	-0.03981	0.01025	-3.88000	0.00000	***
Eastern Cape	-0.01025	0.01175	-0.87000	0.38300	
Northern Cape	-0.00231	0.01535	-0.15000	0.88000	
Free State	0.00607	0.01297	0.47000	0.64000	
KwaZulu-Natal	0.02968	0.01140	2.60000	0.00900	***
Northwest	-0.00703	0.01267	-0.56000	0.57900	
Gauteng	0.02450	0.01151	2.13000	0.03300	**
Mpumalanga	0.00777	0.01299	0.60000	0.55000	
Limpopo	0.00992	0.01256	0.79000	0.43000	
Rural	0.00315	0.00653	0.48000	0.62900	
Constant term	-0.01747	0.01448	-1.21000	0.22800	
male-to-female ratio	-0.00181	0.00344	-0.52000	0.60000	

Like in the second regression (model 6), the impact of the ratio of male to female household members, reflecting gender composition, was not significantly different from zero. The impact of the other explanatory variables was robust to the change in model specification. Again, receipt of the State Old Age Pension and/or the Disability Grant has a significantly positive impact on narrow labour force participation. The summary statistics from this regression are reported in table 4.17 below. The F-statistic of 8.44 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.17: LFS participation model 8 summary statistics

Number of observations	2829
F-statistic for overall model	8.44
Significance of model	99.9%
R-squared	0.0485
Adjusted R-squared	0.0428

The results of all four broad labour participation regression models are summarised in table 4.18 below. Regardless of estimation technique (ordinary least squares or two-stage least squares) and model specification, the two key effects tested by this model are corroborated by all four models: both receipt of the State Old Age Pension and the Disability Grant have a significant positive impact on broad labour force participation. Depending on the model, households receiving the State Old Age Pension have narrow labour force participation rates 11 to 12 percentage points higher than households that do not receive the grant. Likewise, households receiving the

Disability Grant have participation rates 25 percentage points higher. Households receiving both grants have participation rates 36 to 37 percentage points higher. The results are not significantly different across models.

Estimated exogenous income has an insignificant impact on broad labour force participation. However, as with narrow labour force participation, eligibility for the State Old Age Pension (in the absence of actual receipt of the grant) has a negative effect on household labour force participation. Again, this effect is only statistically significant when controlling for the gender composition of the household.

Summary Table 4.18: LFS participation models 5 – 8

LFS status 2 participation rates	two-stage models				ordinary least squares			
	LFS participation model 5		LFS participation model 6		LFS participation model 7		LFS participation model 8	
Exogenous estimated income	0.00000		0.00000					
receipt of old age pension	0.11512	***	0.12397	***	0.10580	***	0.11881	***
Eligibility for old age pension	-0.02994		-0.04721	**	-0.02925		-0.04738	**
receipt of disability grant	0.25240	***	0.25326	***	0.25120	***	0.25289	***
change in number of children	-0.00848	**	-0.00824	**	-0.00767	*	-0.00833	**
change in number of adult women	-0.04046	***	-0.03480	***	-0.04049	***	-0.03468	***
change in household size	0.02274	***	0.02196	***	0.02189	***	0.02153	***
Household members aged 26 to 35	-0.04043	***	-0.04130	***	-0.04002	***	-0.03981	***
Eastern Cape	0.00926		0.00275		-0.00947		-0.01025	
Northern Cape	0.01543		0.00896		-0.00029		-0.00231	
Free State	0.02353		0.01766		0.00769		0.00607	
KwaZulu-Natal	0.04327	***	0.03796	**	0.03143	***	0.02968	***
Northwest	0.00548		0.00174		-0.00655		-0.00703	
Gauteng	0.02831	**	0.02917	**	0.02192	*	0.02450	**
Mpumalanga	0.01488		0.01259		0.00767		0.00777	
Limpopo	0.02926		0.02005		0.01477		0.00992	
Rural	0.00535		0.00617		-0.00017		0.00315	
Constant term	-0.06310		-0.04749		-0.02143		-0.01747	
male-to-female ratio			-0.00173				-0.00181	
F-statistic (overall significance)	9.27000	***	7.99000	***	9.23000	***	8.44000	***

OFFICIAL EMPLOYMENT AND THE CHILD SUPPORT GRANT

The third set of estimates addressed the question of employment using the official definition of the labour force, and the results of four models that evaluate the impact of the Child Support Grant are discussed below. The model incorporates explanatory variables for the three major social grants—the State Old Age Pension (SOAP), the Child Support Grant (CSG) and the Disability Grant (DG). As with the labour force participation models, provincial binary (dummy) variables and a variable to capture the rural effect were also included. Table 4.19 below presents the results of a two-stage least squares regression, with predicted income estimated in the first stage.

Table 4.19: LFS employment model 1

LFS employment model 1	effect (coefficient)	Standard error	student t-statistic	Significance level	
Exogenous estimated income	-0.00001	0.00001	-2.07000	0.03900	**
receipt of old age pension	0.12684	0.02632	4.82000	0.00000	***
receipt of child support grant	0.08467	0.04979	1.70000	0.08900	*
receipt of disability grant	0.27316	0.05461	5.00000	0.00000	***
Eastern Cape	-0.06978	0.03131	-2.23000	0.02600	**
Northern Cape	-0.06283	0.03195	-1.97000	0.04900	**
Free State	-0.05354	0.03017	-1.77000	0.07600	*
KwaZulu-Natal	-0.01857	0.02355	-0.79000	0.43000	
Northwest	-0.05292	0.02561	-2.07000	0.03900	**
Gauteng	-0.01182	0.01935	-0.61000	0.54100	
Mpumalanga	-0.02992	0.02152	-1.39000	0.16500	
Limpopo	-0.07067	0.02745	-2.57000	0.01000	**
Rural	-0.00095	0.01139	-0.08000	0.93400	
Constant term	0.06217	0.06358	0.98000	0.32800	

All three social grants—the State Old Age Pension, the Child Support Grant and the Disability Grant have a significantly positive impact on measured official employment rates. (Although the coefficient on the Child Support Grant is only significant at a 90% level.) Consistent with economic theory, estimated exogenous income had a significantly negative impact on changes in the household employment rate. Table 4.20 below summarises key statistics from the regression model. The F-statistic of 7.78 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.20: LFS employment model 1 summary statistics

Number of observations	2922
F-statistic for overall model	7.78
Significance of model	99.9%
R-squared	0.0336
Adjusted R-squared	0.0293

An alternative specification of the two-stage least squares model was tested which excluded the Disability Grant variable. The results of this specification are reported in table 4.21 below.

Table 4.21: LFS employment model 2

LFS employment model 2	Effect (coefficient)	standard error	student t-statistic	significance level	
Exogenous estimated income	-0.00001	0.00001	-1.95000	0.05200	*
receipt of old age pension	0.15039	0.02601	5.78000	0.00000	***
receipt of child support grant	0.10507	0.04983	2.11000	0.03500	**
Eastern Cape	-0.06662	0.03143	-2.12000	0.03400	**
Northern Cape	-0.05725	0.03206	-1.79000	0.07400	*
Free State	-0.05714	0.03029	-1.89000	0.05900	*
KwaZulu-Natal	-0.02310	0.02363	-0.98000	0.32800	
Northwest	-0.05818	0.02570	-2.26000	0.02400	**
Gauteng	-0.02128	0.01934	-1.10000	0.27100	
Mpumalanga	-0.03853	0.02154	-1.79000	0.07400	*
Limpopo	-0.07674	0.02754	-2.79000	0.00500	***
Rural	-0.00397	0.01142	-0.35000	0.72800	
Constant term	0.07254	0.06380	1.14000	0.25600	

The exclusion of the Disability Grant variable improves the explanatory power of the Child Support Grant variable, which is now significant at the 95% level. The State Old Age Pension variable remains significant at the 99.9% level. The impacts of the other explanatory variables were robust to the change in model specification. The summary statistics from this regression are reported in table 4.22 below. The F-statistic of 6.29 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.22: LFS employment model 2 summary statistics

Number of observations	2922
F-statistic for overall model	6.29
Significance of model	99.9%
R-squared	0.0253
Adjusted R-squared	0.0213

In order to further test the robustness of the results, a third specification was tested excluding the State Old Age Pension variable. The results are presented below in table 4.23.

Table 4.23: LFS employment model 3

LFS employment model 3	effect (coefficient)	standard error	student t-statistic	Significance level	
Exogenous estimated income	-0.00003	0.00001	-4.75000	0.00000	***
receipt of child support grant	0.13747	0.04959	2.77000	0.00600	***
Eastern Cape	-0.10242	0.02820	-3.63000	0.00000	***
Northern Cape	-0.09101	0.02928	-3.11000	0.00200	***
Free State	-0.09902	0.02684	-3.69000	0.00000	***
KwaZulu-Natal	-0.04670	0.02207	-2.12000	0.03400	**
Northwest	-0.08726	0.02409	-3.62000	0.00000	***
Gauteng	-0.03713	0.01779	-2.09000	0.03700	**
Mpumalanga	-0.05227	0.02120	-2.46000	0.01400	**
Limpopo	-0.10650	0.02595	-4.10000	0.00000	***
Constant term	0.17905	0.04244	4.22000	0.00000	***

The exclusion of the State Old Age Pension variable further improves the explanatory power of the Child Support Grant variable, which is now significant at the 99% level. The changes in significance across these three models reflect the multi-collinearity among the social grant explanatory variables. The key summary statistics for the regression are reported in table 4.24 below. The F-statistic of 4.08 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.24: LFS employment model 3 summary statistics

Number of observations	2922
F-statistic for overall model	4.08
Significance of model	99.9%
R-squared	0.0138
Adjusted R-squared	0.0104

A final test of robustness involved a fourth specification, which included a variable distinguishing rural from urban households. The results are presented below in table 4.25.

Table 4.25: LFS employment model 4

LFS employment model 4	effect (coefficient)	Standard error	Student t-statistic	Significance level	
Exogenous estimated income	-0.00003	0.00001	-4.41000	0.00000	***
receipt of child support grant	0.14050	0.04972	2.83000	0.00500	***
Eastern Cape	-0.11235	0.03059	-3.67000	0.00000	***
Northern Cape	-0.10039	0.03136	-3.20000	0.00100	***
Free State	-0.10847	0.02912	-3.73000	0.00000	***
KwaZulu-Natal	-0.05268	0.02319	-2.27000	0.02300	**
Northwest	-0.09319	0.02511	-3.71000	0.00000	***
Gauteng	-0.04290	0.01908	-2.25000	0.02500	**
Mpumalanga	-0.05506	0.02147	-2.57000	0.01000	**
Limpopo	-0.11268	0.02698	-4.18000	0.00000	***
Rural	-0.00958	0.01144	-0.84000	0.40200	
Constant term	0.21372	0.05928	3.61000	0.00000	***

The rural/urban variable was not statistically significant and did not significantly change any of the other coefficients. The key summary statistics for the regression are reported in table 4.26 below. The F-statistic of 3.77 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.26: LFS employment model 4 summary statistics

Number of observations	2922
F-statistic for overall model	3.77
Significance of model	99.9%
R-squared	0.0141
Adjusted R-squared	0.0103

The results of all official employment rate regression models involving the Child Support Grant variable are summarised in table 4.27 below. In all cases, the variables representing receipt of social grants have a significant positive impact on measured official employment rates. The estimated impact of receipt of the Child Support Grant varies depending on how other social grants are included in the model, reflecting a set of interaction effects that call for further research.

Other explanatory variables have reasonable effects consistent with economic theory. Estimated exogenous income has a negative impact on measured official employment rates—again the analysis documents that workers in households with sufficiently high non-employment incomes are less likely to be employed. Geographical variables reflect significant labour market differences across provinces.

Summary Table 4.27: LFS employment models 1 - 4

	LFS employment model 1		LFS Employment model 2		LFS employment model 3		LFS Employment model 4	
exogenous estimated income	-0.00001	**	-0.00001	*	-0.00003	***	-0.00003	***
receipt of old age pension	0.12684	***	0.15039	***				
receipt of child support grant	0.08467	*	0.10507	**	0.13747	***	0.14050	***
receipt of disability grant	0.27316	***						
Eastern Cape	-0.06978	**	-0.06662	**	-0.10242	***	-0.11235	***
Northern Cape	-0.06283	**	-0.05725	*	-0.09101	***	-0.10039	***
Free State	-0.05354	*	-0.05714	*	-0.09902	***	-0.10847	***
KwaZulu-Natal	-0.01857		-0.02310		-0.04670	**	-0.05268	**
Northwest	-0.05292	**	-0.05818	**	-0.08726	***	-0.09319	***
Gauteng	-0.01182		-0.02128		-0.03713	**	-0.04290	**
Mpumalanga	-0.02992		-0.03853	*	-0.05227	**	-0.05506	**
Limpopo	-0.07067	**	-0.07674	***	-0.10650	***	-0.11268	***
Rural	-0.00095		-0.00397				-0.00958	
Constant term	0.06217		0.07254		0.17905	***	0.21372	***
F-statistic (overall significance)	7.78000	***	6.29000	***	4.08000	***	3.77000	***

OFFICIAL EMPLOYMENT AND THE STATE OLD AGE PENSION AND DISABILITY GRANT

The fourth set of regression models address the linkages between employment and the State Old Age Pension and the Disability Grant. The same demographic control variables used in the participation models are employed in these regressions. Similarly, provincial binary (dummy) variables and a variable to capture the rural effect are also included. Table 4.28 below presents the results of a two-stage least squares regression, with predicted income estimated in the first stage.

Table 4.28: LFS employment model 5

	effect (coefficient)	standard error	student t-statistic	significance level	
Exogenous estimated income	-0.00004	0.00001	-5.87000	0.00000	***
receipt of old age pension	0.07946	0.03916	2.03000	0.04300	**
eligibility for old age pension	-0.00829	0.02815	-0.29000	0.76800	
receipt of disability grant	0.20110	0.05163	3.90000	0.00000	***
change in number of children	-0.04517	0.00546	-8.28000	0.00000	***
change in number of adult women	-0.07630	0.01285	-5.94000	0.00000	***
change in household size	-0.02903	0.00989	-2.94000	0.00300	***
Household members aged 26 to 35	0.02216	0.01450	1.53000	0.12600	
Eastern Cape	-0.16665	0.03018	-5.52000	0.00000	***
Northern Cape	-0.14113	0.03064	-4.61000	0.00000	***
Free State	-0.12470	0.02893	-4.31000	0.00000	***
KwaZulu-Natal	-0.07296	0.02265	-3.22000	0.00100	***
Northwest	-0.11520	0.02457	-4.69000	0.00000	***
Gauteng	-0.05245	0.01845	-2.84000	0.00500	***
Mpumalanga	-0.06978	0.02042	-3.42000	0.00100	***
Limpopo	-0.14086	0.02633	-5.35000	0.00000	***
Rural	-0.02191	0.01077	-2.04000	0.04200	**
Constant term	0.28061	0.06123	4.58000	0.00000	***

Both the State Old Age Pension and the Disability Grant have a significantly positive impact on household employment rates. Increases in the share of the household made up by women or children significantly reduce measured employment rates. Again, this is consistent with the hypothesis that childcare responsibilities compete with remunerative work in a manner that disproportionately affects women. The geographical variables (provinces and rural/urban) are all statistically significant. Table 4.29 below summarises key statistics from the regression model. The F-statistic of 29.16 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.29: LFS employment model 5 summary statistics

Number of observations	2922
F-statistic for overall model	29.16
Significance of model	99.9%
R-squared	0.1458
Adjusted R-squared	0.1408

Like with the analysis of participation rates, an alternative specification of the two-stage least squares employment model was tested which incorporated an explanatory variable reflecting the gender composition of the household. The results of this specification are reported in table 4.30 below.

Table 4.30: LFS employment model 6

	Effect (coefficient)	standard error	student t-statistic	significance level	
Exogenous estimated income	-0.00004	0.00001	-5.88000	0.00000	***
receipt of old age pension	0.08562	0.03954	2.17000	0.03000	**
Eligibility for old age pension	-0.02763	0.02844	-0.97000	0.33100	
receipt of disability grant	0.20512	0.05155	3.98000	0.00000	***
change in number of children	-0.04536	0.00548	-8.28000	0.00000	***
change in number of adult women	-0.07060	0.01392	-5.07000	0.00000	***
change in household size	-0.02864	0.01019	-2.81000	0.00500	***
Household members aged 26 to 35	0.01757	0.01463	1.20000	0.23000	
Eastern Cape	-0.17206	0.03073	-5.60000	0.00000	***
Northern Cape	-0.14731	0.03110	-4.74000	0.00000	***
Free State	-0.12773	0.02941	-4.34000	0.00000	***
KwaZulu-Natal	-0.07662	0.02296	-3.34000	0.00100	***
Northwest	-0.11680	0.02491	-4.69000	0.00000	***
Gauteng	-0.05019	0.01859	-2.70000	0.00700	***
Mpumalanga	-0.07152	0.02056	-3.48000	0.00100	***
Limpopo	-0.15154	0.02678	-5.66000	0.00000	***
Rural	-0.01979	0.01094	-1.81000	0.07000	*
Constant term	0.29496	0.06329	4.66000	0.00000	***
male-to-female ratio	-0.00141	0.00481	-0.29000	0.76900	

The impact of the ratio of male to female household members, reflecting gender composition, was again not significantly different from zero. The impact of the other explanatory variables was robust to the change in model specification. The summary statistics from this regression are reported in table 4.31 below. The F-statistic of 24.5 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.31: LFS employment model 6 summary statistics

Number of observations	2829
F-statistic for overall model	24.5
Significance of model	99.9%
R-squared	0.1356
Adjusted R-squared	0.1301

In order to further test the robustness of the results, a third specification was tested using Ordinary Least Squares estimation for the set of explanatory variables employed in the original regression (model 5). In order to test this specification, the instrumental variable for income was omitted from the regression. The results are presented below in table 4.32.

Table 4.32: LFS employment model 7

	Effect (coefficient)	standard error	student t-statistic	significance level	
receipt of old age pension	0.13758	0.03839	3.58000	0.00000	***
eligibility for old age pension	-0.00879	0.02835	-0.31000	0.75700	
receipt of disability grant	0.20281	0.05198	3.90000	0.00000	***
change in number of children	-0.04378	0.00588	-7.45000	0.00000	***
change in number of adult women	-0.07465	0.01292	-5.78000	0.00000	***
change in household size	-0.02538	0.00997	-2.55000	0.01100	**
Household members aged 26 to 35	0.00260	0.01484	0.18000	0.86100	
Eastern Cape	-0.01828	0.01662	-1.10000	0.27100	
Northern Cape	-0.01144	0.02137	-0.54000	0.59300	
Free State	0.00930	0.01795	0.52000	0.60400	
KwaZulu-Natal	0.02167	0.01602	1.35000	0.17600	
Northwest	-0.01383	0.01762	-0.79000	0.43200	
Gauteng	0.00288	0.01599	0.18000	0.85700	
Mpumalanga	-0.01397	0.01819	-0.77000	0.44300	
Limpopo	-0.02541	0.01762	-1.44000	0.14900	
Rural	0.01272	0.00946	1.35000	0.17900	
Constant term	-0.06040	0.01953	-3.09000	0.00200	***
children under 7 years of age	0.00175	0.01307	0.13000	0.89400	

The results are not significantly different than from the previous two specifications. Receipt of both the State Old Age Pension and the Disability Grant has a positive effect on the increase in measure employment rates. The magnitude of the impact is significantly greater than the magnitudes in the previously estimated two-stage least square models. The child and female household composition variables have similar effects in both versions of the model. The geographic variables are not significant in the Ordinary Least Squares model. The key summary statistics for the regression are reported in table 4.33 below. The F-statistic of 26.81 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.33: LFS employment model 7 summary statistics

Number of observations	2922
F-statistic for overall model	26.81
Significance of model	0.0000
R-squared	0.1357
Adjusted R-squared	0.1306

A final test of robustness involved a fourth specification, tested using Ordinary Least Squares estimation for the set of explanatory variables employed in the second employment regression above (model 6). Like in model 7 above, the instrumental variable for income was omitted from the regression. This alternative specification of the Ordinary Least Squares model incorporated an explanatory variable reflecting the gender composition of the household. The results are presented below is table 4.34 below.

Table 4.34: LFS employment model 8

	effect (coefficient)	standard error	student t-statistic	Significance level	
receipt of old age pension	0.14625	0.03840	3.81000	0.00000	***
Eligibility for old age pension	-0.02563	0.02861	-0.90000	0.37000	
receipt of disability grant	0.20945	0.05185	4.04000	0.00000	***
change in number of children	-0.04426	0.00551	-8.04000	0.00000	***
change in number of adult women	-0.07207	0.01400	-5.15000	0.00000	***
change in household size	-0.02357	0.01022	-2.31000	0.02100	**
Household members aged 26 to 35	-0.00003	0.01441	0.00000	0.99800	
Eastern Cape	-0.01931	0.01652	-1.17000	0.24300	
Northern Cape	-0.01485	0.02158	-0.69000	0.49100	
Free State	0.00848	0.01824	0.47000	0.64200	
KwaZulu-Natal	0.02058	0.01603	1.28000	0.19900	
Northwest	-0.01373	0.01780	-0.77000	0.44100	
Gauteng	0.00469	0.01618	0.29000	0.77200	
Mpumalanga	-0.01486	0.01827	-0.81000	0.41600	
Limpopo	-0.03258	0.01766	-1.85000	0.06500	*
Rural	0.01570	0.00918	1.71000	0.08700	*
Constant term	-0.05774	0.02035	-2.84000	0.00500	***
male-to-female ratio	-0.00056	0.00484	-0.12000	0.90800	

Like in the second regression (model 6), the impact of the ratio of male to female household members, reflecting gender composition, was not significantly different from zero. The impacts of the other significant explanatory variables were robust to the change in model specification. Again, receipt of the State Old Age Pension and/or the Disability Grant has a significantly positive impact on measured employment rates. The summary statistics from this regression are reported in table 4.35 below. The F-statistic of 23.62 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.35: LFS employment model 8 summary statistics

Number of observations	2829
F-statistic for overall model	23.62
Significance of model	99.9%
R-squared	0.1250
Adjusted R-squared	0.1197

The results of all four employment regression models involving the State Old Age Pension and the Disability Grant are summarised in table 4.36 below. Regardless of estimation technique (ordinary least squares or two-stage least squares) and model specification, the two key effects tested by this model are corroborated by all four regressions: both receipt of the State Old Age Pension and the Disability Grant have a significant positive impact on measured household employment rates. Depending on the model, households receiving the State Old Age Pension have employment rates 8 to 15 percentage points higher than households that do not receive the grant. Likewise, households receiving the Disability Grant have employment rates 20 to 21 percentage points higher. Households receiving both grants have employment rates 28 to 36 percentage points higher. The two-stage least squares results are quantitatively significantly different from the Ordinary Least Squares results (although the results are not qualitatively different).

Estimated exogenous income has a negative impact on employment rates—workers in households with sufficiently high non-labour incomes are less likely to be employed. However, as with narrow labour force participation, eligibility for the State Old Age Pension (in the absence of actual receipt of the grant) has a negative effect on employment, but this effect is not statistically significant for any of these models. The provincial variables are statistically significant for the two-stage least squares models, reflecting significant labour market differences across provinces.

Summary Table 4.36: LFS employment models 5 – 8

LFS employment models	two-stage models				Ordinary least squares			
	LFS Employment model 5		LFS employment model 6		LFS Employment model 7		LFS employment model 8	
Exogenous estimated income	-0.00004	***	-0.00004	***				
receipt of old age pension	0.07946	**	0.08562	**	0.13758	***	0.14625	***
eligibility for old age pension	-0.00829		-0.02763		-0.00879		-0.02563	
receipt of disability grant	0.20110	***	0.20512	***	0.20281	***	0.20945	***
change in number of children	-0.04517	***	-0.04536	***	-0.04378	***	-0.04426	***
change in number of adult women	-0.07630	***	-0.07060	***	-0.07465	***	-0.07207	***
change in household size	-0.02903	***	-0.02864	***	-0.02538	**	-0.02357	**
Household members aged 26 to 35	0.02216		0.01757		0.00260		-0.00003	
Eastern Cape	-0.16665	***	-0.17206	***	-0.01828		-0.01931	
Northern Cape	-0.14113	***	-0.14731	***	-0.01144		-0.01485	
Free State	-0.12470	***	-0.12773	***	0.00930		0.00848	
KwaZulu-Natal	-0.07296	***	-0.07662	***	0.02167		0.02058	
Northwest	-0.11520	***	-0.11680	***	-0.01383		-0.01373	
Gauteng	-0.05245	***	-0.05019	***	0.00288		0.00469	
Mpumalanga	-0.06978	***	-0.07152	***	-0.01397		-0.01486	
Limpopo	-0.14086	***	-0.15154	***	-0.02541		-0.03258	*
Rural	-0.02191	**	-0.01979	*	0.01272		0.01570	*
Constant term	0.28061	***	0.29496	***	-0.06040	***	-0.05774	***
male-to-female ratio			-0.00141				-0.00056	
children under 7 years of age					0.00175			
F-statistic (overall significance)	29.16000	***	24.50000	***	26.81000	***	23.62000	***

CROSS-SECTION ESTIMATES

The individual labour force participation and employment regressions are reported in the appendix below. In general, because of sample selection problems and data issues, the results are not robust and most of the social grant variables are not statistically significant. Following the example of Bhorat and Leibbrandt, the econometric analysis estimates separate regressions for males and females broken down into rural and urban sub-samples. The appendix reports both employment and labour force participation regressions, including the sample selection equations in each case.

With respect to labour force participation rates, the effects of the State Old Age Pension and the Disability Grant are statistically significantly positive for rural females. However, for rural males and urban males and females, all the social grants have effects that are not statistically different from zero. Other economically important variables have fragile relationships to labour force participation, or yield theoretically inconsistent signs.

The results from the employment equations yield somewhat more significant results. For both rural males and females, the effects of the State Old Age Pension and the Disability Grant are statistically significantly positive. Workers in households receiving either a State Old Age Pension or a Disability Grant are about ten percent more likely to be employed. Workers in households receiving both grants are approximately twenty percent more likely to be employed. However, the effect of the State Old Age Pension for urban males is significantly negative by the same magnitude. The differential effects for urban and rural workers is a persistent theme in the literature on social security's impact on labour markets. The results identified by the cross-sectional analysis may be spurious because the sample selection methodology is relatively weak in its capacity to control for unobserved heterogeneity in the sample.

Overall, the cross-sectional analysis provides some weak evidence that social grants have positive effects on both labour market participation and employment. However, the results are not unambiguous and certainly not conclusive. However, they tend to corroborate the stronger results identified by the panel analysis, supporting the findings that social grants have positive labour market effects.

4.4) LABOUR DEMAND

This section builds on the household impact study as well as the evidence from the previous section in order to identify specific transmission mechanisms between social security programmes and worker productivity effects. Social assistance that increases labour productivity has the potential to increase the demand by employers for workers, which is generally measured as the marginal productivity of labour. Directly, social grants support the accumulation of human capital by a worker, and it supports the worker's productivity-bolstering consumption. Better nutrition, health care, housing and transportation can all support the increased productivity of the worker. Indirectly, social assistance supports higher worker productivity by reducing the drain on a worker's

consumption created by informal remittance-oriented private safety nets. The International Labour Organisation's 1996 report documents how the tendency for large family remittances to flow from urban to rural areas places South African firms at a structural disadvantage, resulting in reduced employment.

The analysis estimates the effects of social grant receipt on wages using this panel data, by computing the average wage per week per worker for which data is available[38] in each PSU and regressing the percent change in this average wage against the percent of household receiving social grants, along with a number of other demographic variables.

The first set of results are reported in table 4.37 below. Like in the participation and employment equations, both the State Old Age Pension and the Disability Grant have a significantly positive impact on wages. Again, the effect of the Child Support Grant is not significant. The household composition variables are all significant, and some of the geographical variables are significant. An alternate specification was estimated incorporating the male-to-female ratio, as a test for wage discrimination in the workplace. The social grant effects were the same as described above, but the male-to-female ratio was not statistically significant.

Table 4.37: Wages and social grants

Explanatory variable	Baseline model			Discrimination test		
	Estimated impact	t-statistic		Estimated impact	t-statistic	
% receiving SOAP	0.379	2.060	*	0.445	2.370	*
% age-eligible for SOAP	0.079	0.590		-0.089	-0.640	
% receiving CSG	0.019	0.080		0.042	0.180	
% receivng DG	0.557	2.210	*	0.627	2.470	*
change in # of children	-0.287	-10.720	*	-0.290	-10.690	*
change in # of women	-0.288	-4.580	*	-0.283	-4.130	*
change in household size	0.288	6.040	*	0.292	5.890	*
% of household aged 26-35	-0.001	-0.010		0.019	0.260	
Eastern Cape	-0.048	-0.590		-0.037	-0.460	
Northern Cape	-0.097	-0.930		-0.088	-0.830	
Free State	-0.279	-3.210	*	-0.268	-3.000	*
KwaZulu-Natal	-0.154	-1.980		-0.150	-1.910	
North West	-0.125	-1.450		-0.117	-1.330	
Gauteng	-0.218	-2.810	*	-0.224	-2.820	*
Mpumalanga	-0.283	-3.200	*	-0.302	-3.360	*
Limpopo	-0.160	-1.870		-0.175	-2.020	*
Rural effect	-0.045	-1.030		-0.021	-0.460	
Male-to-female ratio				-0.012	-0.510	
Constant term	0.003	0.030		-0.009	-0.090	

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[38] Average wage per week per worker with data equals the sum of wage values divided by the number of workers reporting a nonzero, non-missing weekly wage value.

Given the insignificance of the Child Support Grant variable in the above equations, this explanatory variable was dropped and three alternative specifications were tested. The first specification is presented in table 4.38 below.

Table 4.38: LFS wage model 1

	effect (coefficient)	standard error	Student t-statistic	significance level	
receipt of old age pension	0.38019	0.18290	2.08000	0.03800	**
eligibility for old age pension	0.07841	0.13310	0.59000	0.55600	
receipt of disability grant	0.55872	0.25136	2.22000	0.02600	**
change in number of children	-0.28738	0.02667	-10.78000	0.00000	***
change in number of adult women	-0.28779	0.06273	-4.59000	0.00000	***
change in household size	0.28869	0.04771	6.05000	0.00000	***
Household members aged 26 to 35	-0.00006	0.06880	0.00000	0.99900	
Eastern Cape	-0.04718	0.08025	-0.59000	0.55700	
Northern Cape	-0.09617	0.10358	-0.93000	0.35300	
Free State	-0.27900	0.08687	-3.21000	0.00100	***
KwaZulu-Natal	-0.15355	0.07760	-1.98000	0.04800	**
Northwest	-0.12382	0.08530	-1.45000	0.14700	
Gauteng	-0.21729	0.07725	-2.81000	0.00500	***
Mpumalanga	-0.28204	0.08791	-3.21000	0.00100	***
Limpopo	-0.15994	0.08545	-1.87000	0.06100	*
Rural	-0.04472	0.04371	-1.02000	0.30600	
Constant term	0.00251	0.09453	0.03000	0.97900	

Like in the wage equations above, the variables representing receipt of the State Old Age Pension and the Disability Grant have statistically significant positive effects on wages. Demographic and provincial variables are also statistically significant. The summary statistics from this regression are reported in table 4.39 below. The F-statistic of 16.06 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.39: LFS wage model 1 summary statistics

Number of observations	2916
F-statistic for overall model	16.06
Significance of model	99.9%
R-squared	0.0814
Adjusted R-squared	0.0764

To test robustness, an alternative specification was tested which included the ratio of males to females in the household. The results of this specification are presented in table 4.40 below.

Table 4.40: LFS wage model 2

	effect (coefficient)	Standard error	student t-statistic	Significance level	
receipt of old age pension	0.44730	0.18700	2.39000	0.01700	**
eligibility for old age pension	-0.08945	0.13927	-0.64000	0.52100	
receipt of disability grant	0.62976	0.25277	2.49000	0.01300	**
change in number of children	-0.29017	0.02697	-10.76000	0.00000	***
change in number of adult women	-0.28316	0.06846	-4.14000	0.00000	***
change in household size	0.29236	0.04956	5.90000	0.00000	***
household members aged 26 to 35	0.01992	0.07033	0.28000	0.77700	
Eastern Cape	-0.03613	0.08089	-0.45000	0.65500	
Northern Cape	-0.08627	0.10540	-0.82000	0.41300	
Free State	-0.26703	0.08917	-2.99000	0.00300	***
KwaZulu-Natal	-0.14915	0.07844	-1.90000	0.05700	*
Northwest	-0.11489	0.08701	-1.32000	0.18700	
Gauteng	-0.22296	0.07907	-2.82000	0.00500	***
Mpumalanga	-0.30040	0.08937	-3.36000	0.00100	***
Limpopo	-0.17408	0.08654	-2.01000	0.04400	**
Rural	-0.01968	0.04485	-0.44000	0.66100	
Constant term	-0.00996	0.09955	-0.10000	0.92000	
male-to-female ratio	-0.01247	0.02366	-0.53000	0.59800	

Again, as in the wage equations above, the addition of this gender impact variable did not significantly change the results, and the variable is not statistically significant. As in all the wage equations above, the variables representing receipt of the State Old Age Pension and the Disability Grant have statistically significant positive effects on wages. Demographic and provincial variables are also statistically significant. The summary statistics from this regression are reported in table 4.41 below. The F-statistic of 13.96 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.41: LFS wage model 2 summary statistics

Number of observations	2816
F-statistic for overall model	13.96
Significance of model	99.9%
R-squared	0.0782
Adjusted R-squared	0.0726

As a final test of robustness, an alternative specification was tested which included number of children under the age of 7 in the household. The results of this specification are presented in table 4.42 below.

Table 4.42: LFS wage model 3

	effect (coefficient)	standard error	student t-statistic	significance level	
receipt of old age pension	0.39639	0.18451	2.15000	0.03200	**
eligibility for old age pension	0.07327	0.13334	0.55000	0.58300	
receipt of disability grant	0.56601	0.25162	2.25000	0.02500	**
change in number of children	-0.29428	0.02860	-10.29000	0.00000	***
change in number of adult women	-0.28887	0.06276	-4.60000	0.00000	***
change in household size	0.29140	0.04789	6.09000	0.00000	***
household members aged 26 to 35	0.01380	0.07186	0.19000	0.84800	
Eastern Cape	-0.04217	0.08060	-0.52000	0.60100	
Northern Cape	-0.09646	0.10359	-0.93000	0.35200	
Free State	-0.28213	0.08700	-3.24000	0.00100	***
KwaZulu-Natal	-0.15112	0.07769	-1.95000	0.05200	*
Northwest	-0.12590	0.08537	-1.47000	0.14000	
Gauteng	-0.21960	0.07733	-2.84000	0.00500	***
Mpumalanga	-0.27918	0.08802	-3.17000	0.00200	***
Limpopo	-0.15673	0.08559	-1.83000	0.06700	*
Rural	-0.03551	0.04583	-0.77000	0.43900	
Constant term	0.00101	0.09457	0.01000	0.99200	
children under 7 years of age	-0.04251	0.06353	-0.67000	0.50300	

The addition of this young children variable did not significantly change the results, and the variable is not statistically significant. As in all the wage equations above, the variables representing receipt of the State Old Age Pension and the Disability Grant have statistically significant positive effects on wages. Demographic and provincial variables are also statistically significant. The summary statistics from this regression are reported in table 4.43 below. The F-statistic of 15.14 demonstrates the overall significance of the regression at a level of 99.9%.

Table 4.43: LFS wage model 3 summary statistics

Number of observations	2916
F-statistic for overall model	15.14
Significance of model	99.9%
R-squared	0.0816
Adjusted R-squared	0.0762

The results of all three of these wage regression models involving the State Old Age Pension and the Disability Grant are summarised in table 4.44 below. Regardless of model specification, the two key effects tested by this model are corroborated by all three regressions: both receipt of the State Old Age Pension and the Disability Grant have a significant positive impact on measured wages.

Eligibility for the State Old Age Pension (in the absence of actual receipt of the grant) has no consistent impact on wages, and this variable is not statistically significant for any of these models. The provincial variables are statistically significant for several provinces, reflecting significant labour market differences across provinces. Increases in the number of children and women as a share of total household size have a significant negative impact on wage growth.

Summary Table 4.44: LFS wage models 1 – 3

	LFS wage model 1		LFS wage model 2		LFS wage model 3	
receipt of old age pension	0.38019	**	0.44730	**	0.39639	**
Eligibility for old age pension	0.07841		-0.08945		0.07327	
receipt of disability grant	0.55872	**	0.62976	**	0.56601	**
change in number of children	-0.28738	***	-0.29017	***	-0.29428	***
change in number of adult women	-0.28779	***	-0.28316	***	-0.28887	***
change in household size	0.28869	***	0.29236	***	0.29140	***
Household members aged 26 to 35	-0.00006		0.01992		0.01380	
Eastern Cape	-0.04718		-0.03613		-0.04217	
Northern Cape	-0.09617		-0.08627		-0.09646	
Free State	-0.27900	***	-0.26703	***	-0.28213	***
KwaZulu-Natal	-0.15355	**	-0.14915	*	-0.15112	*
Northwest	-0.12382		-0.11489		-0.12590	
Gauteng	-0.21729	***	-0.22296	***	-0.21960	***
Mpumalanga	-0.28204	***	-0.30040	***	-0.27918	***
Limpopo	-0.15994	*	-0.17408	**	-0.15673	*
Rural	-0.04472		-0.01968		-0.03551	
Constant term	0.00251		-0.00996		0.00101	
male-to-female ratio			-0.01247			
Children under 7 years of age					-0.04251	
F-statistic (overall significance)	16.06000	***	13.96000	***	15.14000	***

4.5) POLICY IMPLICATIONS

Conventional economic theory suggests that social grants may undermine labour force participation by reducing the opportunity cost of not working. Models developed for industrialised countries and applied broadly to South African data sometimes corroborate this hypothesis. However, when models are developed that reflect the labour market behaviour of South Africans who receive social grants, the results contradict this hypothesis. The response of very low income South Africans to a marginal increase in their income is significantly different from the response of median income South Africans.

To the extent that social grants create adverse labour market effects, the adverse consequences stem from distortions in social security targeting mechanisms. For instance, to the extent that the State Old Age Pensions are employed to target the non-pensioner poor, then the grants may encourage a household formation response that impedes job search. These types of problems can be addressed by broadening the base of the social security programmes. The more comprehensive the system of social security, the fewer distortions are generated by the incentive effects created by the social grants.

This study explicitly examines the impact of social grants on the labour market participation, employment success and realised wages of South Africans in households

receiving social grants. While statistical analysis cannot prove causation, the empirical results are consistent with the hypotheses that:

(4) Social grants provide potential labour market participants with the resources and economic security necessary to invest in high-risk/high-reward job search.

(5) Living in a household receiving social grants is correlated with a higher success rate in finding employment.

(6) Workers in households receiving social grants are better able to improve their productivity and as a result earn higher wage increases.

The empirical evidence discussed in this chapter demonstrates that people in households receiving social grants have increased both their labour force participation and employment rates faster than those who live in households that do not receive social grants.   In addition, workers in households receiving social grants have realised more rapid wage increases. These findings are consistent with the hypothesis that South Africa's social grants increase both the supply and demand for labour. This suggests that South Africa's system of social grants promotes employment creation.

CHAPTER 5)
The Macro-economic Impact of Social Assistance Programmes

5.1) INTRODUCTION

Chapter 5 empirically assesses the macro-economic impact of South Africa's social security programmes in terms of changes in the overall level and composition of aggregate demand, with a particular focus on capacity utilisation, savings and investment, the trade balance and the domestic labour content of consumption. Social security programmes redistribute spending power within the economy, and this has important effects on several macro-economic variables. According to the government's ten-year review, public spending on social grants has increased from ten billion rand in 1994 to over thirty-five billion rand in 2003.[39] The evidence identified in this chapter supports the position that social grants have macro-economic effects that promote investment, economic growth and job creation, with positive consequences for the balance of payments and little if any adverse effect on inflation.

5.2) COMPOSITION OF SPENDING

Social assistance programmes redistribute income among groups with significantly varying expenditure patterns, leading to substantial changes in the demand facing different economic sectors. Table 5.1 presents the average share of expenditure spent by different income groups (deciles) on important categories of spending.

Table 5.1: Expenditure Shares by Income Deciles

Spending category	Lowest income decile	2nd lowest income decile	3rd lowest income decile	…	3rd highest income decile	2nd highest income decile	highest income decile
Food	0.4185	0.4401	0.4196	…	0.2345	0.1820	0.1098
Tobacco	0.0648	0.0465	0.0441	…	0.0400	0.0298	0.0190
Clothing	0.0382	0.0419	0.0488	…	0.0581	0.0466	0.0289
Housing	0.0718	0.0642	0.0682	…	0.1406	0.1726	0.1797
Fuel	0.0540	0.0457	0.0416	…	0.0091	0.0044	0.0024
Furniture	0.0062	0.0093	0.0141	…	0.0319	0.0282	0.0219
Medical	0.0063	0.0085	0.0080	…	0.0240	0.0415	0.0506
Transport	0.0279	0.0276	0.0323	…	0.0685	0.0890	0.1205
Communication	0.0060	0.0077	0.0092	…	0.0225	0.0286	0.0330
Education	0.0191	0.0122	0.0166	…	0.0313	0.0345	0.0334
Personal Care	0.0600	0.0505	0.0515	…	0.0418	0.0368	0.0253
Holiday	0.0030	0.0004	0.0027	…	0.0055	0.0133	0.0149
Total income	3022	6058	7793	…	39091	69268	200949
Total spending	6029	8292	9767	…	39875	67820	189048

Source: **Statistics South Africa 2000** *Income and Expenditure Survey*

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[39] Towards a ten year review, page 17.

The composition of spending across the income distribution is important because South Africa's system of social security effectively redistributes spending power from upper income groups to those in the lowest income categories. The shares of expenditure of each group provide an indication of how consumers increase or reduce spending in different sectors of the economy as their incomes change. The analysis of the table above demonstrates three particularly significant categories of expenditure affected by the redistribution resulting from South Africa's social grants. Food is the largest category of spending for the poor, but significantly less important for upper income groups. Transport demonstrates the opposite pattern—a relatively low share of spending for lower income groups, increasing to one of the most important categories for upper income groups. The table with all the deciles is reported in Appendix A5.1.

Contrary to typical spending patterns in most countries; the households in the lowest decile allocate a smaller proportion of their expenditure to food than do the households in the next higher decile. Graph 5.1 below depicts the evolution of expenditure shares on food across the income distribution. Initially, the expenditure share rises from 41.9% for the lowest income decline of the population to 44.0% for the next higher decile. Then the expenditure share on food declines steadily, reflecting Engel's Law (discussed in Chapter 3), falling as low as 11.0% of total expenditure for the population's highest income decile.

Figure 5.1: Food expenditure share of household spending by income group
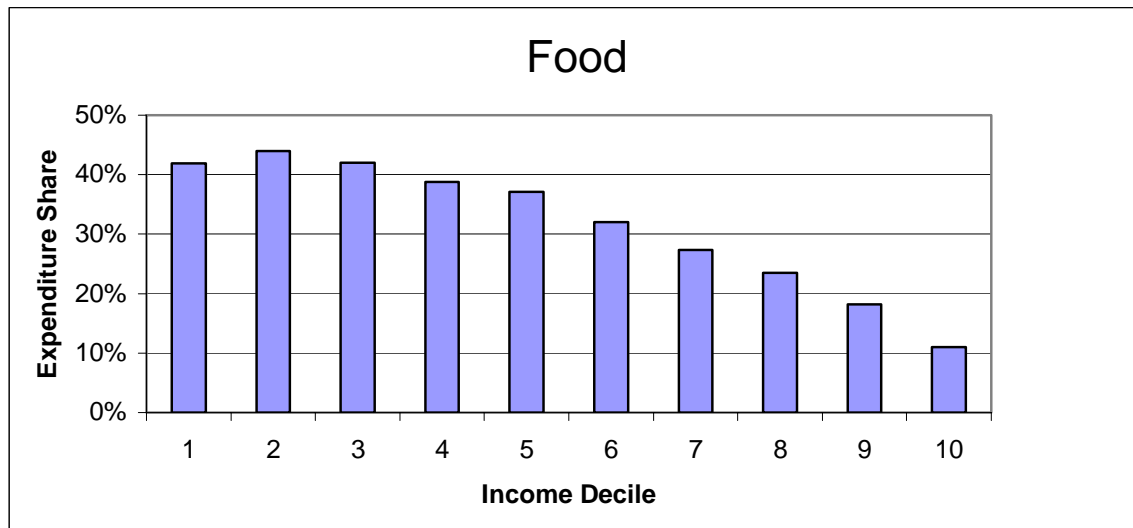
Source: **Statistics South Africa 2000** *Income and Expenditure Survey*

The upper income groups spend a greater percentage of their expenditure on transport, communication, and holidays while the lower income households concentrate their spending on basic goods such as food, clothing, and items for personal care.

Graph 5.2 below depicts the evolution of transportation expenditure shares across the income distribution, showing a monotonic rise.

Figure 5.2: Transportation share of household spending by income group

Transport
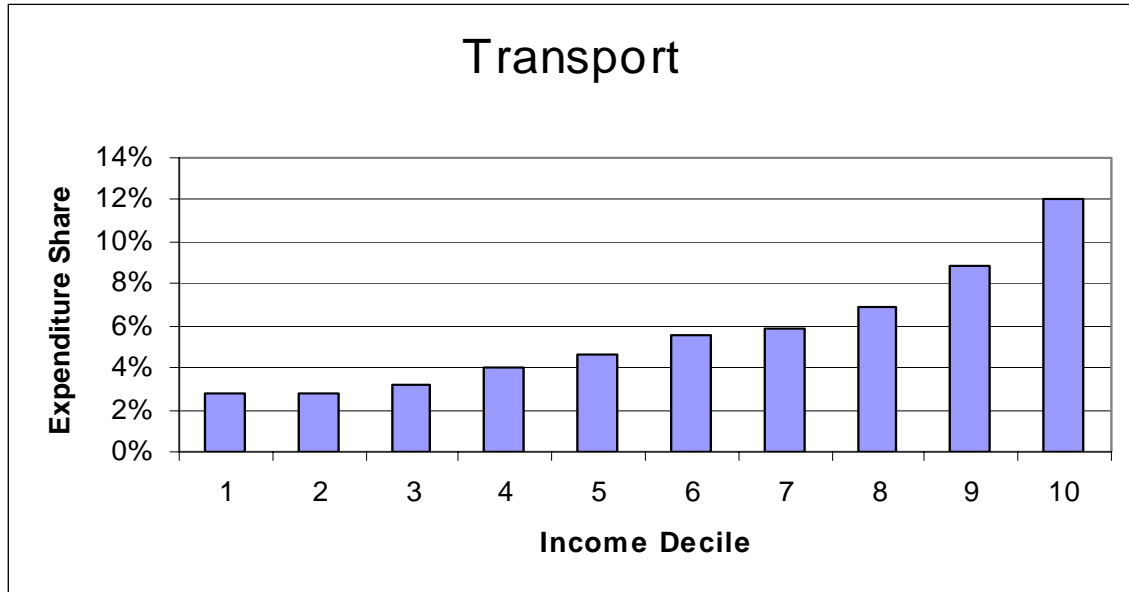
Clothing is most important (relative to income) for middle income groups—the relative share of spending is lower for both the lowest and highest income groups. The distribution across deciles is presented in the graph below.

Figure 5.3: Clothing share of household spending by income group

Clothing

Assuming the expenditure shares accurately reflect the different propensities to consume across the income groups, these graphs provide evidence of how the composition of spending changes as social grants redistribute income. As spending power changes, lower income groups—with sector-specific consumption propensities—receive more income, and spending tendencies evolve towards those of marginally higher income groups. Likewise, the highest income groups have less disposable income—so their priority sectors experience less demand, and spending tendencies may evolve to become more like those of lower income groups. The resulting change in the composition of overall spending reflects two effects: (1) people's consumption behaviour changes as their income changes, and (2) the relatively importance of lower income households increases as their share of overall spending rises.

The changing composition of demand resulting from social security programmes affects the level and composition of employment in South Africa. Table 5.2 summarises the analysis of production and employment in relevant manufacturing sectors in South Africa.

Table 5.2: Analysis of spending categories (based on 1ˢᵗ Quarter 2002 data)

Spending Category	Value of South African Production (R000)	Value of Domestic Consumption (R000)	Domestic Consumption % produced in South Africa	Number of Employed Workers	Employment to Output Ratio (per Rmillion)
Food	16,163,901	15,681,455	90.66%	149,514	9.25
Personal Care	7,191,136	9,658,732	58.88%	73,226	10.18
Fuel	8,334,649	7,112,692	92.84%	13,114	1.57
Clothing	2,632,215	2,800,938	76.79%	128,858	48.95
Furniture, Equip.	1,701,599	1,033,469	77.24%	47,397	27.85
Transport	14,719,448	18,554,275	53.69%	76,580	5.20
Communications	807,058	4,060,117	6.76%	12,495	15.48

Source: **dti database and EPRI calculations**

The transportation industry tends to be adversely affected by spending composition changes resulting from the redistribution impact of social grants. This industry has a relatively low domestic production content, and is very capital intensive. As a result, the reduced spending on transportation has a relatively small impact on national income and an even smaller impact on employment. Likewise, the communications industry tends to be adversely affected by spending composition changes, and while this industry is labour intensive, it has a very low domestic production content. As a result, the reduced spending on communications has a very small negative impact on both national income and employment.

The food, clothing and personal care sectors are positively affected by the redistribution impact of social grants. These industries have relatively high domestic production contents, and are also all relatively labour intensive. As a result, the increased spending in these categories has a relatively large impact on national income and employment. The net impact of the positive and negative changes in the composition of spending tends to increase national income and employment.

5.3) SAVINGS, INVESTMENT, AND THE BALANCE OF TRADE

Social grants affect national savings through two channels. First, private domestic savings are affected because social grants redistribute income among groups with different savings rates. In South Africa, as in most countries, this effect tends to reduce private domestic savings as the upper income groups from which taxes are levied to pay for grants have higher savings rates than the lower income households to whom the grants are distributed.

Graph 5.4 below depicts the evolution of savings rates across the income distribution. All deciles in the lower half of the distribution have savings rates less than one percent—from 0.2% for the poorest decile, rising to 0.9% for the fifth decile. The decile right above the median—the sixth decile—breaks the one- percent barrier with an average savings rate of 1.5%. The savings rate rises steadily up to 3.7% for the ninth decile. The rate then rises to 5.5% for the highest income decile.

Figure 5.4: Savings rates by income group
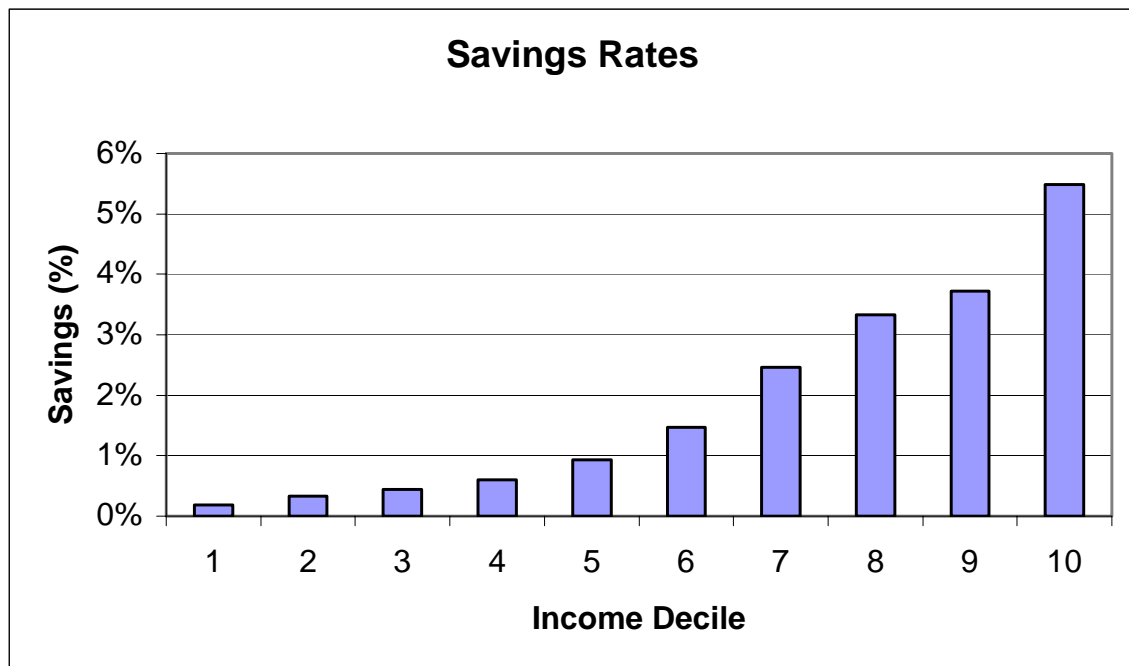
Source: **Statistics South Africa 2000** *Income and Expenditure Survey*

These savings rates reflect reported savings by households in the 2000 *Income and Expenditure Survey*, across a spectrum of financial instruments listed on the questionnaire. As a result, this measure does not reflect national savings, and is subject to potentially significant measurement bias, particularly with respect to offshore savings. Reported offshore savings by the top decile are fourteen times the reported offshore savings of the next lower decile.

Further offsetting the greater savings rates of the higher income groups is the increased propensity of upper income groups to incur debt. Average indebtedness (relative to household income) of the highest income groups (the top quintile) is nine times that of the lowest income groups (the bottom quintile).

Figure 5.5: Debt as a percentage of total household income, by income group
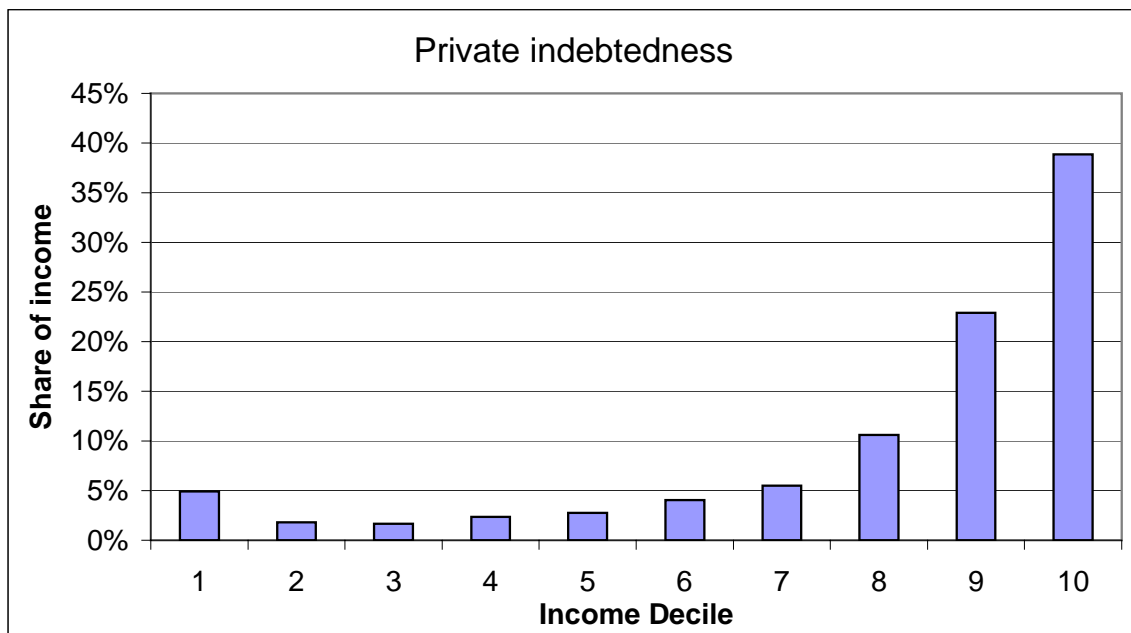
Source: **Statistics South Africa 2000** *Income and Expenditure Survey*

It is likely, however, that the net contribution to national savings from the highest income groups is higher than that of the lower income groups. The second savings channel, however, tends to have the opposite effect. Analysis of the changing composition of spending demonstrates that the redistribution impact of social grants reduces the demand for imported goods, tending to reduce the need for capital inflows to finance the trade deficit and thus increasing overall savings.

Table 5.3 Balance of Trade Analysis

Industry	Exports	Imports	Net Exports	Percentage (%) of Domestic consumption produced in South Africa
Food	1,947,350	1,464,904	482,446	90.66%
Personal Care	1,504,124	3,971,720	-2,467,596	58.88%
Fuel	1,731,223	509,266	1,221,957	92.84%
Cloth	481,401	650,124	-168,723	76.79%
Furniture	903,382	235,252	668,130	77.24%
Transport	4,758,579	8,593,406	-3,834,827	53.69%
Communications	532,593	3,785,652	-3,253,059	6.76%

Source: **dti database and EPRI calculations**

The two industries most negatively affected by the redistribution impact (transport and communications) are net importers. Most of the sectors positively affected are net exporters and all have very high domestic production contents. The first order impact of the redistribution impact of social grants tends to improve the balance of trade but has an ambiguous impact on national savings.

5.4) IMPACT OF SOCIAL GRANTS ON INFLATION

Similar to the impact on savings and the trade balance, an increase in transfer payments by the South African government to the poor has two effects on inflation. First, as this analysis has established thus far, an increase in social grants would result in an increase in aggregate demand as domestic content of consumption and an increase in domestic labour. Consequently, there would be an increase in total aggregate demand thereby making the economy susceptible to demand-pull inflation.

However, if there is a corresponding increase in production, then there might not be an increase in the price level and the only effect of the policy will be an increase in income. The data suggests that aggregate supply may indeed increase given an increase in aggregate demand. According to Statistics South Africa, in May 2003, the manufacturing industry as a whole was only utilising 78.8% of its existing production capacity. The table below shows the evolution of capacity utilisation in South Africa over the past three decades. It is apparent that capacity utilisation for the past several years has been significantly lower than the average for the past decades. As a result, there is a substantial stock of unutilised fixed capital that could be brought into productive use if sufficient demand were available.

Figure 5.6: Manufacturing capacity utilisation: durable versus non-durable
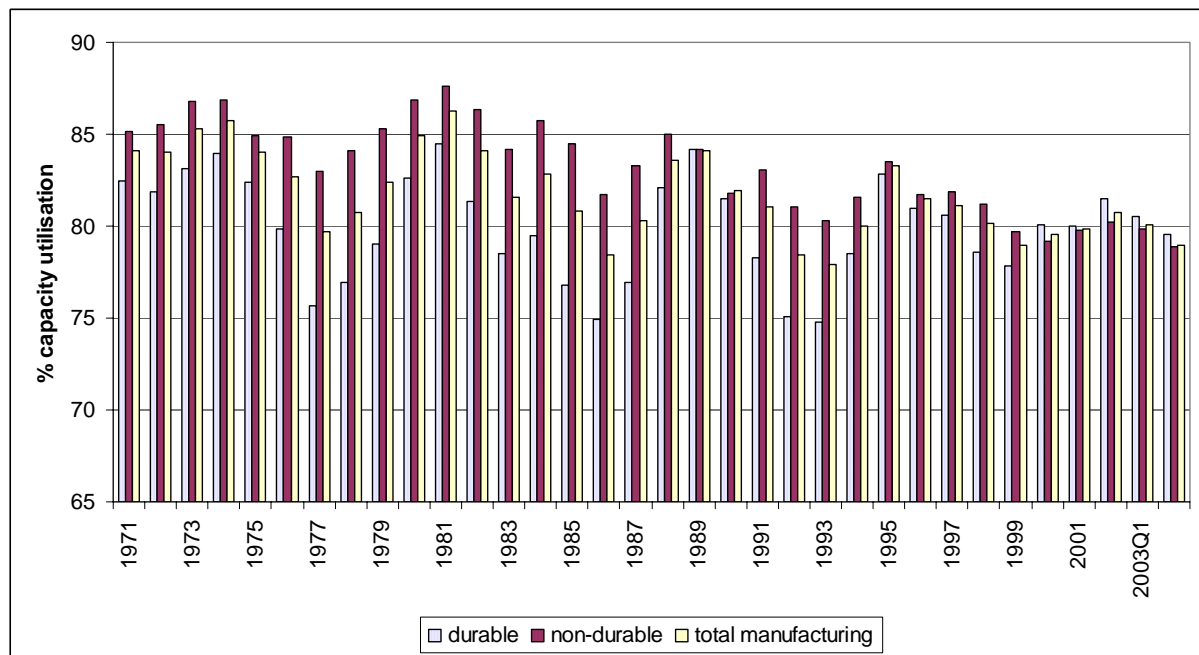
 In a countrywide survey, managers of private and public businesses attributed 14.9% of the 21.2% total under-utilisation to insufficient demand alone. Thus, South African firms have the existing capacity to supply more goods and services but do not do so because there is not enough demand in the market. Table 5.4 presents dis-aggregated data on capacity utilisation.

Table 5.4: Capacity Utilisation by Sector

Spending category	Capacity Utilisation %	Under-Utilisation %	% Due to Insufficient Demand
Food	75.2	24.8	12.4
Personal Care	77.9	22.1	16.2
Fuel	83.2	16.8	11.9
Cloth	82.5	17.5	12.4
Furniture	79.3	20.7	14.6
Transport	75.7	24.3	17.1
Communication	60.2	39.8	35.1
Total	78.8	21.2	14.9

Source: **dti database and EPRI calculations**

While the economy may be susceptible to increased inflation, it appears likely that some of this will be tempered by the increase in aggregate supply, as producers will begin to

use under-utilised capacity in response to the higher aggregate demand. This is especially true in the food and personal care industries. The net effect is that this spending tends to provide a demand-side stimulus that increases the demand for labour, promoting increased employment. The government's human resource development strategy recognises that without such a demand-side stimulus, poverty and inequality will continue to undermine the generation of "increased aggregate demand for goods and services, therefore limiting economic growth."[40]

The second channel influencing inflation through the falling trade deficit's impact on the exchange rate. As the trade deficit falls, the rand tends to appreciate, and an appreciating rand tends to reduce inflation.

5.5) MACRO-ECONOMIC IMPACT OF SOCIAL GRANTS FROM INEQUALITY REDUCTION

Persistent and extreme inequality is one of the most serious problems facing South Africa. The 1996 World Development Report found that only Brazil had a more unequal society than South Africa, as measured by the Gini coefficient. This inequality has substantial macroeconomic consequences. The World Bank argues that poverty and inequality retard economic growth: "the foregone cost of not accounting for the poor may compromise economic growth in the long-run. In order to survive, the poor may... resort to criminal or marginalised activities.... Moreover, denying the poor access to economic and educational opportunities accentuates inequality - an outcome likely to retard economic growth."[41] There is an extensive literature that documents the relationship between severe inequality (like that found in South Africa) and low rates of economic growth. Over the past decade, numerous cross-country econometric studies have found a negative effect of inequality on economic growth.[42] Several methodological studies have corroborated these results.[43] Theoretical and empirical cross-country evidence demonstrates that effective social security programmes yield social benefits that increase private investment and stimulate economic growth.[44] However, while the theoretical and empirical links between severe inequality and low rates of growth are well-documented, there still in no consensus among economists about the relationship between inequality and growth under less extreme circumstances.

This study examines some empirical data to quantify the link between reduced inequality and higher rates of economic growth. To determine the impact of continued

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[40] Human Resource Development Strategy for South Africa, 2001, op.cit.

[41] Subbarao, Bonnerjee, and Braithwaite (1997).

[42] For two particularly important studies, see Alesina and Rodrik (1994); Persson and Tabellini (1994).

[43] Perotti (1994) and (1996); Lipton and Ravallion (1995).

[44] Cashin (1995).

inequality on the macro-economy, this study analyses growth rates and inequality measures (Gini coefficients) "for those countries for which reliable data are available."[45] The analysis shows that high Gini coefficients are significantly correlated with low rates of economic growth, as depicted in the graph below.

Figure 5.7: Initial inequality and subsequent economic growth
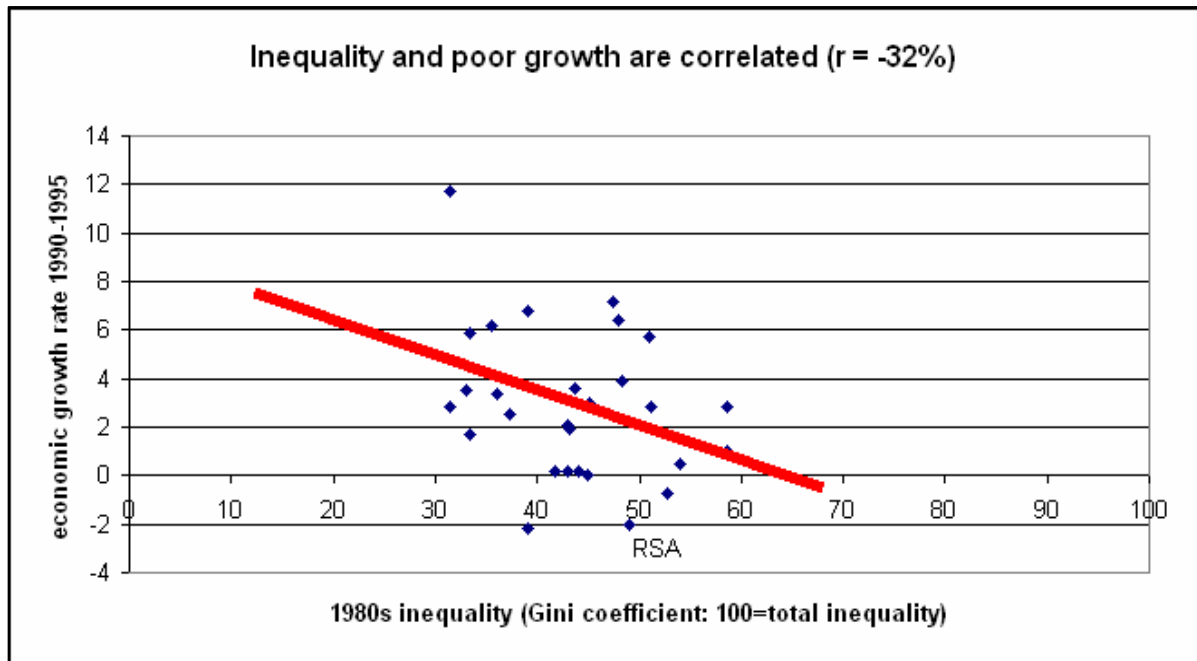
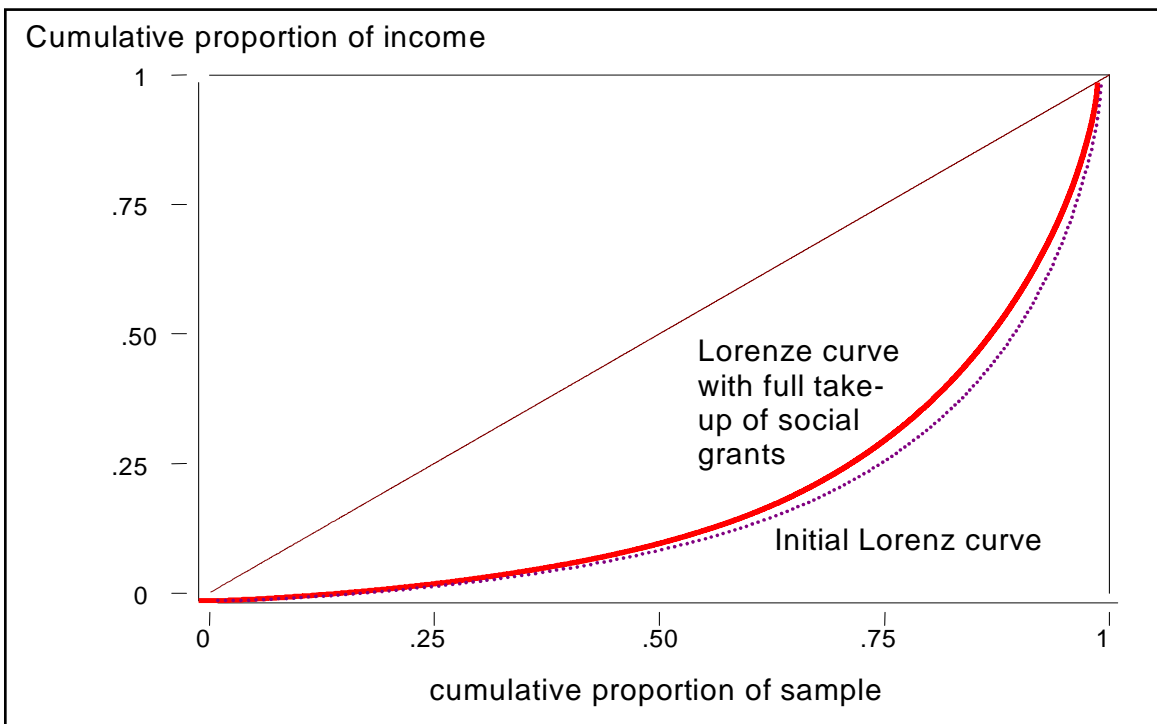*Source*: **Hoeven (2001) and EPRI calculations**

A simple linear regression of cross-country Gini coefficients against growth rates estimates that a 1% decrease in the Gini is associated with a 0.12% increase in growth. (This result was statistically significant at the 90% level. The data for this regression are reported in Appendix A5.2.) These findings are corroborated by a multitude of papers that identify similar results. Studies "run over a variety of data sets and periods with many different measures of income distribution, deliver a consistent message: initial inequality is detrimental to long-run growth" (Benabou 2003). For additional studies that document a significant negative relationship between inequality and growth, see Alesina-Rodrick (1994), Clarke (1992), Perotti (1992, 1994, 1996), Persoson-Tabellini (1992, 1994), and Venieris-Gupta (1986).

An increased take-up in social grants, then, would have the effect of reducing South Africa's Gini coefficient as the income differentials across the income distribution would be reduced. A redistribution programme that pays for these grants with increased taxes would have an even more pronounced effect because the disposable income of

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[45] van der Hoeven (2001).

the upper income households would be reduced. Using the data provided in the 2000 *Income and Expenditure Survey*, this study developed a simulation which determined how the Gini coefficient would change under a scenario of full take-up State Old Age Pensions, Disability Grants, and Child Support Grant, as discussed in chapter 2. The simulation quantifies a reduction in the Gini coefficient of 3 percentage points, from 63% to 60%. The figure below depicts the Lorenz curve for total household income both before and after the simulations. The straight 45-degree line is the distribution of income in a perfectly equal society. The curve on the right represents the income distribution before full take-up and the curve on the left represents the distribution after the increased take-up. The shifting up of the Lorenz curve represents the significant improvement in income distribution resulting from South Africa's social security system, under the assumption of full take-up.

Figure 5.8: The impact of social grants on South Africa's distribution of income

Source: **Hoeven (2001) and EPRI calculations**

Given the marginal impact of improved equality on growth estimated above (which is conservative by the standards of the international literature), this increase in equality is associated with a 0.36% increase in the growth rate.

5.6) MACRO-ECONOMIC IMPACT OF SOCIAL GRANTS THROUGH EDUCATION

Improvements in the income distribution promote economic growth through diverse transmission channels. Social security grants improve distribution directly—by redistributing income from wealthier groups to poorer groups. But social grants also exert important indirect effects, by changing household behaviour, as discussed in chapter 3 of this report. Improvements in nutrition, health and education increase productivity and support higher wages, with important consequences for the distribution of income. The positive link between improved household incomes and improved educational attainment by children is rigorously documented.[46] The strong impact of social grants on schooling for girls in South Africa's case is particularly important. A study by Ranis and Stewart found that the most consistent predictor of successful human development was improved female education, particularly through the consequent improvements in infant survival and child nutrition.[47] Education also improves economic performance; not only through improved labour productivity, but also through improved capital productivity. A more educated workforce is more likely to innovate, raising capital productivity.[48]

One important macroeconomic effect of social grants is the economic growth resulting indirectly through improved education. Numerous academic studies have underscored the link between improved access to education and higher rates of economic growth.[49] This economic growth increases the resources society has available to fund the social security programme, as well as other public priorities. Economic growth directly supports the expansion of fiscal resources.

Barro (1999) analyses the relationship between economic growth and its fundamental determinants, including years of schooling as a measure of education-based human capital. Two versions of his model are presented in the table below, which evaluated cross-country data from 1965 to 1995. The results strongly support the link between schooling and economic growth—in both the full sample (model 1) and restricted sample (model 2), years of schooling was one of the most significant and substantively important explanatory variables. (The estimated effects of education were statistically significant at the 99.9% level in both cases.)

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[46] Alderman (1996); Behrman and Wolf (1987a); Behrman and Wolf (1987b); Birdsall (1985); Deolalikar, (1993); and King and Lillard (1987).
[47] Ranis and Stewart, (2000)
[48] Lucas Jr. (1988).
[49] In particular, see Barro (1999), Becker and Tomes (1986), Lucas (1988), and Azariadis and Drazen (1990).

Table 5.5: The Barro model of economic growth

Explanatory variable	MODEL 1 Coefficient	MODEL 1 t-statistic	MODEL 2 Coefficient	MODEL 2 t-statistic
log(per capita GDP)	0.1240	4.59	0.1030	3.43
log(per capita GDP) squared	-0.0095	-5.28	-0.0082	-4.32
govt. consumption/GDP	-0.1490	-6.48	-0.1530	-5.67
rule-of-law index	0.0172	3.25	0.0102	1.57
democracy index	0.0540	1.86	0.0430	1.30
democracy index squared	-0.0480	-1.85	-0.0380	-1.36
inflation rate	-0.0370	-3.70	-0.0140	-1.56
years of schooling	**0.0072**	4.24	**0.0066**	3.88
log(total fertility rate)	-0.0251	-5.34	-0.0306	-5.67
investment/GDP	0.0590	2.68	0.0620	2.95
growth rate of terms of trade	0.1650	5.89	0.1240	3.54

SOURCE: **Barro (1999)**

Likewise, Gylfason (2000, 2001a) has quantified the link between improvements in educational outcomes and economic growth. Recognising that secondary school enrolment rates are imperfect yet common measures of human capital accumulation, Gylfason tests and confirms that primary and tertiary enrolment rates, years of school and education expenditure indicators yield similar results. His model explains economic growth with a simpler set of explanatory variables than those employed by Barro— Gylfason focuses on education, natural capital, human capital (education), physical capital and initial levels of income. The model is presented in the table below. All the explanatory variables are statistically significant at the 99.9% level. Initial income and natural capital are associated with lower growth rates, while investment and enrolment rates are associated with higher investment rates. The second model excludes education from the specification in order to test its incremental impact—enrolment rates explain fifteen percent of the variability in growth rates.

Table 5.6:The Gylfason model of economic growth

Explanatory variable	MODEL 1 Coefficient	MODEL 1 t-statistic	MODEL 2 Coefficient	MODEL 2 t-statistic
Constant	9.35	6.00	3.87	2.50
Natural capital	-0.06	4.30	-0.09	5.70
Enrolment rate	0.04	5.90		
Investment	0.07	3.10	0.13	4.50
Initial income	-1.40	7.00	-0.51	3.20
R-squared	0.64		0.49	

The graph below depicts the positive relationship between adjusted growth rates (excluding the effect of initial income levels) and the secondary school enrolment rates. The simple correlation is also statistically significant, and illustrates South Africa's position in the cross-country analysis. The data underlying this graph are reported in Appendix A5.3.

Figure 5.9: The relationship between education and growth
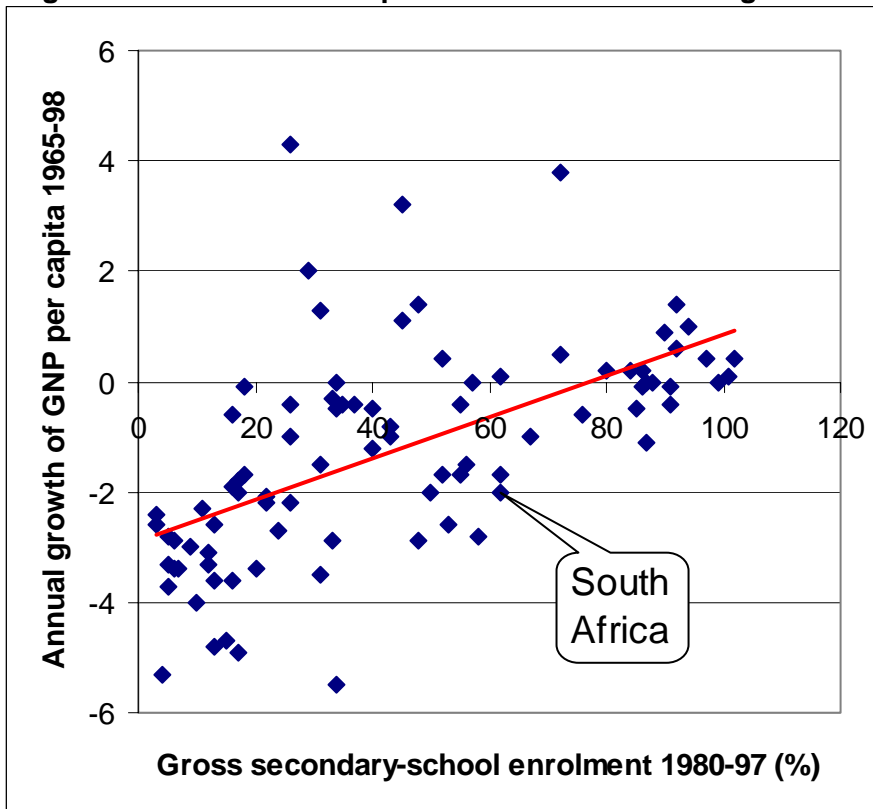
SOURCE: Gylfason (2001)

5.7) CONCLUSION

At the macro-economic level, South Africa's system of social development grants tends to increase domestic employment while promoting a more equal distribution of income. The effects of grants on national savings and the trade balance are ambiguous, since grants have two competing effects on the national savings—one through private domestic savings, and the other through the trade deficit. Depending on the magnitude of the effects, grants could improve or worsen national savings and the trade balance. Initial analysis suggests that the impact on savings may be negative, while that on the trade balance may be positive. However, since much of the savings of upper income groups are offshore, the negative impact is unlikely to be significant, particularly given the small share of private savings in the national savings rate. The impact on inflation may also be ambiguous. The increase in overall demand in the economy may generate some inflationary pressure. However, the relatively low rate of capacity utilisation may enable the economy to meet this demand without significant increases in inflation. Likewise, the positive trade balance effects may lead to an appreciation of the rand, tending to dampen imported inflation. On balance, the macro-economic impact of South Africa's social security system is largely positive. These positive macroeconomic effects support higher rates of economic growth, which are re-inforced by the social security system's positive effects on income distribution and education.

CHAPTER 6)
Summary, Conclusions and Policy Implications

This study documents how South Africa's social assistance grants play a vital role in reducing poverty and promoting social development. The key findings are summarised and discussed below.

6.1) THE IMPACT ON POVERTY

South Africa's social grants successfully reduce poverty, regardless of which methodology is used to quantify the impact measure or identify the poverty line. Nevertheless, the quantitative measure of poverty reduction is sensitive to the methodological choices. For instance, the measured impact is consistently greatest when employing the total rand poverty gap as an indicator. The poverty headcount measure, however, consistently yields the smallest results. Likewise, the choice of poverty line heavily influences the measurement of the quantitative impact. The current social security system is most successful when measured against destitution, and the impact is smallest when poverty lines ignore economies of scale and adult equivalence issues. For instance, South Africa's social grants reduce the poverty headcount measure by 4.3%, as measured against the Committee of Inquiry's expenditure poverty line (with no scales). The social security system, however, reduces 45% of the total rand destitution gap—an impact more than ten times greater.

Using the Committee of Inquiry expenditure poverty line (without scales), a 10% increase in take-up of the SOAP reduces the poverty gap by only 1.2%, and full take-up by only 2.5%. The take-up rate for the SOAP is already very high, and many of the eligible elderly not already receiving the SOAP are not among the poorest South Africans. As a result, further extensions of the SOAP have limited potential in reducing poverty. Extensions of the Disability Grant offer greater promise, although at substantially greater expense. A 50% increase in DG take-up reduces the total rand poverty gap by 1.7%, and full take-up generates a 5.1% reduction. The greatest poverty reducing potential lies with the progressive extension of the Child Support Grant. Extending the eligibility age to 14 reduces the poverty gap by 16.6%, and a further extension to age 18 reduces the gap by 21.4%. Increasing the real grant payment (as the government did in 2003) generates an even greater impact. The extension to age 14 yields a 22% poverty gap reduction, while the extension to age 18 reduces the poverty gap by 28.3%. Combining the higher CSG extended to age 14 with the full take-up of the SOAP and the DG yields a reduction in the total rand poverty gap of 29%.

The evidence in this report documents the substantial impact of South Africa's social security system in reducing poverty and destitution. The magnitudes of the results are sensitive to methodological issues. It matters whether the poverty line is relative or absolute, whether it is scaled for household composition and economies of scale or not, and to a small extent whether it measures income or expenditure. Likewise, it matters how the poverty impact is measured—using poverty headcount or variants on the poverty gap. Nevertheless, the qualitative results, and the answers to critical policy questions, are robust to different methodological approaches. South Africa's system of social security substantially reduces deprivation, and the progressive extension of the magnitude, scope and reach of social grants holds the potential to dramatically diminish the prevalence of poverty in South Africa.

6.2) THE IMPACT ON HOUSEHOLD WELL-BEING

The results of this study provide evidence that the household impacts of South Africa's social grants are developmental in nature. These findings are consistent with international lessons of experience, as well as with previous studies of South Africa's system of social security.

Poverty and its associated consequences erode the opportunities for children and youth to attend school, fomenting a vicious cycle of destitution by undermining the household's capacity to accumulate the human capital necessary to break the poverty trap. Children in households that receive social grants, however, are more likely to attend school. Spending in these households focuses more strongly on basic needs, like food, fuel, housing and household operations, and less is spent on tobacco and debt. In case after case in this study, household outcomes conflicted with the simple implications of monetary income rankings. While many measures of well-being are correlated with aggregate income and expenditure, the exceptions affect large numbers of people and require careful policy analysis. The evidence in this report underscores the importance of moving beyond measures of income poverty in the assessment of social deprivation.

6.3) THE LABOUR MARKET IMPACT

This study explicitly examines the impact of social grants on the labour market participation, employment success and realised wages of South Africans in households receiving social grants. While statistical analysis cannot prove causation, the empirical results are consistent with the hypotheses that:
(1) Social grants provide potential labour market participants with the resources and economic security necessary to invest in high-risk/high-reward job search.
(2) Living in a household receiving social grants is correlated with a higher success rate in finding employment.
(3) Workers in households receiving social grants are better able to improve their productivity and as a result earn higher wage increases.

The empirical evidence discussed in this chapter demonstrates that people in households receiving social grants have increased both their labour force participation and employment rates faster than those who live in households that do not receive social grants. In addition, workers in households receiving social grants have realised more rapid wage increases. These findings are consistent with the hypothesis that South Africa's social grants increase both the supply and demand for labour. This evidence does not support the hypothesis that South Africa's system of social grants negatively affects employment creation.

6.4) THE MACRO-ECONOMIC IMPACT

At the macro-economic level, South Africa's system of social development grants tends to increase domestic employment while promoting a more equal distribution of income. The effects of grants on national savings and the trade balance are ambiguous, since grants have two competing effects on the national savings—one through private domestic savings, and the other through the trade deficit. Depending on the magnitude of the effects, grants could improve or worsen national savings and the trade balance. Initial analysis suggests that the impact on savings may be negative, while that on the trade balance may be positive. However, since much of the savings of upper income groups are offshore, the negative impact is unlikely to be significant, particularly given the small share of private savings in the national savings rate. The impact on inflation may also be ambiguous. The increase in overall demand in the economy may generate some inflationary pressure. However, the relatively low rate of capacity utilisation may

enable the economy to meet this demand without significant increases in inflation. Likewise, the positive trade balance effects may lead to an appreciation of the rand, tending to dampen imported inflation. On balance, the macro-economic impact of South Africa's social security system is largely positive. These positive macroeconomic effects support higher rates of economic growth, which are re-inforced by the social security system's positive effects on income distribution and education.

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