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ABSTRACT

Despite South Africa's transition from apartheid in 1994, the social landscape is still fragmented along racial lines. However, South Africa has an impressive social grants system by international standards, with social assistance spending as a percentage of GDP comparing to Western European countries during the 1980s (the height of the welfare state). This paper investigates the impact of social grants poverty and inequality in South African. Using the Income and Expenditure Survey of 2005 (IES2005) the normalized Foster-Greer-Thorbecke (FGT) measure and the General Entropy (GE) measure (to assess the impact of social grants on poverty and inequality, respectively), it is found that social grants have a considerable impact on poverty, and that this impact increases as the poverty measure being used becomes more sensitive to the severity of poverty. In terms of inequality, it is found that social grants have a negligible impact. The reason for this is that inequality is largely driven by the upper end of the income distribution – a group who do not receive social grants.

Keywords: Welfare and Poverty, Government Policy, Provision and Effects of Welfare Programmes, Measurement and Analysis of Poverty, Inequality
JEL codes: I3, I38, I32, D63

1. INTRODUCTION

1994 saw the end of Apartheid in South Africa. Despite the political and constitutional changes characterizing South Africa's transition from apartheid, the distribution of income and poverty within society remained largely similar to that which prevailed during the era of discrimination under apartheid. The political transition from Apartheid to an era underpinned by the ideology of equal rights was not mirrored in the economic well-being of the citizens of South Africa: inequality in poverty levels still characterize the economic landscape.

South Africa's social security system has its origins in the apartheid era with efforts being made to create a welfare state for white South Africans. Although the first pension fund was established as early as 1882 by the Transvaal Republic, this pension fund was not prescribed by legislation and as such did not constitute social insurance. The Pension Funds Act of 1956 played a substantial role in the regulation of the financial responsibilities of pension funds, although less skilled workers continued to be excluded from pension coverage. In the context of apartheid, this implies the exclusion of African workers. It was only in the 1960s and 1970s that rapid industrialization saw a large number of African workers being drawn into industry, resulting in an expansion of occupational retirement funds to some African workers. Indeed, the total membership of private and occupational retirement funds increased from 923 000 to 9 309 000 between 1958 and 1993 (although this figure does reflect a substantial amount of duplication, with a large number of South Africans belonging to more than one fund) (Smith Committee, 1995). However, despite this rapid extension in coverage, the majority of the African labour force remained outside the formal sector and therefore outside the coverage of the social insurance net, either because they were unemployed or because they were employed in industries in which social retirement insurance was not available (Van der Berg, Lekezwa and Siebrits, 2008).

Although various racially differentiated social assistance grants were introduced by the South African government in the early 1900s (namely military pensions (1919), social pensions (1928), pensions for war veterans (1941), family allowances for large, poor families (1947)), it was only in the 1980s as part of the apartheid government's attempt to legitimize the tricameral parliament and homeland system that the full commitment to the elimination of racial differences in all social programmes in the social security system began. Fiscal constraints faced by the government at the time necessitated a simultaneous decrease in the benefits received by white South Africans and increase in the benefits received by African South Africans, and this was most effectively achieved in areas in which resistance to such a reduction in benefits would be smallest i.e. amongst politically weak and marginal white groups. For example, the benefit received by poor elderly white people receiving the means-tested social old-age pension was reduced and by 1993, the pension gap had been eliminated (Van der Berg, Lekezwa and Siebrits, 2008).

The late 1980s onwards was therefore characterized by substantial increases in government social assistance spending. The combination of equalization of benefits, the rapid increase in the up-take of foster-care and disability grants and the introduction of the child support grant in 1998 were the main drivers of the sizeable increase. Indeed, the apartheid-era origins of South Africa's social security system resulted in the extension of a system that was created with the objective of protecting a small section of society resulting in a social assistance system that may be considered unusually comprehensive by middle-income developing country standards (Van der Berg, Lekezwa and Siebrits, 2008).

South Africa can be said to have a well-developed social security system, largely on par with the social security systems of developed countries and unlike those in place in other developing countries (Booysen, 2004: 46). The expansion of the social grants by R22 billion between 2005 and 2007 translates into grant expansions in excess of R1000 per person. Given that poverty may be defined as people surviving on incomes less than R3000 per person per year, this expansion is considerable (Van der Berg, Louw and Yu, 2007). Indeed, the income of South Africa's poor was collectively R27 billion, and so an increase in social grants of R22 billion, if well-targeted, would impact substantially on poverty in South Africa. Indeed, even if social grants were not well-targeted, an increase of this magnitude may be expected to contribute considerably to poverty alleviation (Van der Berg, Louw and Yu, 2007).

Government spending on social grants in South Africa is well-targeted. Woolard (2003) explains that in 2000, 66.8% of the total income of the poorest 20% of the South African population was social grants, while less than 1% of the income of the richest 20% of the population was grant income. Van der Berg, Lekezwa and Siebrits (2008) report that 76% of government spending on social grants is received by the poorest 40% of the population (some 50% of the population as a whole), and that grants increase the share of total income of these households from 4.7% to 7.8% of total income.

The coverage of social grants has also increased remarkably in recent years, with the number of recipients increasing from 2.4 million in April 1998 to approximately 12.4 million in 2008. It appears that increased coverage of the child support grant has driven this increase, with a projected 66.6% of all grants paid in April 2008 being child support grants. Other grants with high coverage are social old-age pensions (17.9%) and the disability grants (11.3%). However, although the child support grant has the widest reach, it is not the largest grant available. Table 1 presents the values of social grants in 2008.

TABLE 1: MONTHLY VALUES OF SOCIAL GRANTS (AS OF SEPTEMBER 2008)

Old-Age Pension	R960
War Veterans Grant	R960
Disability Grant	R940
Care Dependency Grant	R940
Foster-Care Grant	R650
Grant-In-Aid	R210
Child Support Grant	R210*

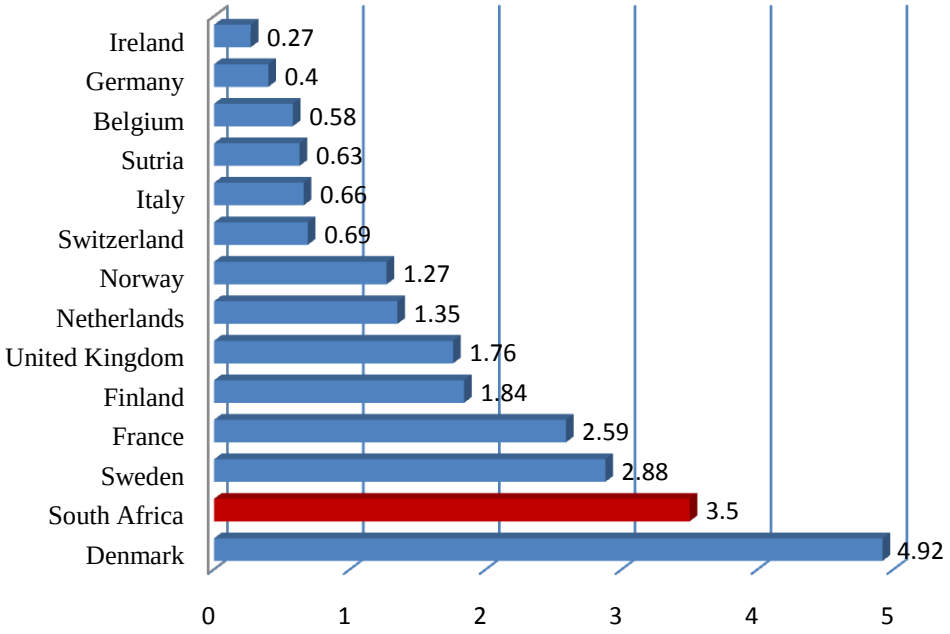
Source: Lekezwa and Siebrits, 2008

*Increased to R220 in October 2008

The level of social assistance spending in South Africa at present is extremely high. In 2006, social assistance spending in South Africa amounted to 3.5% of GDP – an extremely large proportion, even when compared to that of Western European countries in the 1980s. Indeed, as figure 1 below illustrates, it is only Denmark in which social spending as a proportion of GDP exceeds that of South Africa (Van der Berg, Lekezwa and Siebrits, 2008). Important to remember is that the 1980s was the "height of the welfare state" in Western Europe, and so the fact the level of social assistance

spending was higher than that of 1980s Western Europe illustrates the extent of social assistance spending in South Africa in recent years.

FIGURE 1: Social Assistance Spending as % of GDP (Western Europe 1980; South Africa 2006)



Source: Van der Berg, Lekezwa and Siebrits, 2008: 7

It is therefore clear that social grants in South Africa are sizeable and indeed impressive in comparison to both developed and developing countries. In addition to the impressive coverage of South Africa's social assistance system, the impact of social grants on household formation implies that the impact of social grants extends further than simply to those who qualify to receive them. Indeed, the phenomenon of people moving into households in which grants are received (particularly in the case of social old age pensions) has for example resulted in the increased effectiveness of grants in alleviating poverty for a greater network of people (Klasen and Woolard, 2002). Furthermore, this formation of households around social grant income has kept old people in the community, empowered them and contributed to the reduction in their dependence on their children (Van der Berg, Lekezwa and Siebrits, 2008). Social grants in South Africa are therefore an important instrument of poverty alleviation.

Previous Findings

A study focusing on African rural households in the former homelands of South Africa, conducted by Leibbrandt, Woolard and Woolard (1996) investigated the relative importance of various income sources in terms of their contribution to inequality in South Africa. This was done by investigating how a change in one of the components in income would contribute to a change in the Gini coefficient, using a decomposition that takes account of the share of a particular source of income in total group income, the Gini coefficient that the measures the extent of inequality in the distribution of that source of income, and the *Gini correlation* between the income from the particular source

and total income[1] (Leibrrandt, Woolard and Woolard, 1996). The study made use of data obtained in the *Project for Statistics on Living Standards and Development* conducted in 1993.

Leibbrandt et al (1996) found that the income sources in which a change exerted the biggest influence on the overall Gini coefficient were state transfers, remittances and wages. In the case of wages, an increase resulted in an increase in the Gini coefficient (reflecting an increase in inequality), and in the case of remittances and state transfers, an increase in these income sources resulted in a decrease in the Gini coefficient (reflecting a decrease in inequality). They also found that the income sources that tended to increase inequality were highly correlated with the overall rankings of income, implying that an increase in these sectors predominantly benefited those at the top of the income distribution and therefore increased the Gini.

Leibbrandt et al (1996) also considered the impact of a change in income components on welfare. They explained that a change in income components influenced welfare through two channels, namely that an increase in mean income generally increased welfare, and that the income distribution was altered within the sample (indicated by the Gini coefficient) which either enhanced or diminished welfare, depending on the impact that an increase in a given income component had on inequality.

The authors found that for African rural households in the former homeland areas of South Africa, state welfare transfers increased overall welfare. However, for the poorest amongst these households (defined by the authors as households below the subsistence level[2]), the distribution effect discussed above was negative, indicating that state welfare transfers "worsened" the distribution of income (i.e. rendered it less equal). However, this negative distribution effect was outweighed by the positive income effect, rendering the overall welfare effect positive. For households above the household subsistence level, both the income and distribution effect were positive, indicating that state welfare transfers both increased the income received by households and contributed to a more equal distribution of income amongst these households. The combined positive effects mentioned above therefore resulted in an overall positive welfare effect on state welfare transfers (Leibbrandt et al, 1996).

A later paper by Leibbrandt, Woolard and Woolard (2008) investigated the role played by social assistance grants in poverty reduction. They emphasised the centrality of social grants to poverty alleviation in South Africa, and pointed out that the system by which social grants were allocated and distributed was well-developed for a middle income country. Indeed, by 2007, social assistance constituted 3.3% of GDP, compared to 1.9% of GDP in 2000/01, and by 2007 some 12 million people benefitted from social grants (Leibbrandt et al, 2008).

An analysis by Van der Berg, Louw and du Toit (2007) indicated that in 1995 and 2000, the concentration coefficient for social grants took a value of -0.434 and -0.431, respectively. These

[1] $G = \sum_{k=1}^{k} R_k \, G_k S_k$, where S_k is the share of income source k in total income, G_k is the Gini coefficient that the measures the inequality of the distribution of income source k, and R_k is the *Gini correlation* between income from source k and total income. See Leibbrandt et al (1996) for a full discussion of the method.

[2] Subsistence levels are defined according to poverty lines that were published by the Institute for Planning Research. According to Deaton (1994), these poverty lines could be converted to adult equivalence scales: $E = (A + 0.5K)^{0.9}$, where E = number of adult equivalents, A = number of adults, and K = number of children (Leibbrandt et al, 1996).

negative values indicated that the lower end of the income distribution received more than their share of social grants and was therefore an indication that social grants were well-targeted in South Africa.

This paper contributes to the literature on social grants and their role in poverty alleviation and the reduction of inequality by making use of decomposition techniques that allow one to observe the contribution that each income source makes to poverty alleviation and to income inequality. The paper makes use of the 2005 Income and Expenditure Survey to conduct the analysis.

Section 2 of the paper discusses the data used in the paper, while section 3 presents the poverty analysis. This section includes an explanation of the decomposition technique, as well as snapshot of poverty (using the Foster-Greer-Thorbecke index) by race and educational attainment of the household head. The decomposition technique by which the contribution of various income sources to poverty alleviation is measured is explained in that section, and the results from this decomposition are discussed, with emphasis on the role of social grants. Section 4 of the paper presents the inequality analysis. The section includes an explanation of the General Entropy measure used to analyse inequality, followed by the results obtained using this measure. Results are presented for inequality by race, gender, province, area and level of education. Inequality is then decomposed according to income source and the results presented, again with emphasis on the role of social grants in the reduction of inequality. Section 5 concludes.

2. Data

This paper makes use of the 2005 Income and Expenditure Survey (IES). This survey was conducted by Statistics South Africa between September 2005 and August 2006. Although the IES is primarily aimed at identifying the bundle of goods to be used in constructing the Consumer Price Indexto, it does provide enough information to perform poverty and inequality analysis.

The dataset contains information on income and consumption at a household level. Both income and consumption were converted to a per capita level. Consumption data were used in the analysis of poverty, and income was used in the analysis of inequality.

The 2005/2006 IES differs somewhat from the previous two IES's (1995 and 2000). The most prominent difference is the adoption of a diary method which is a method by which household members record spending on a daily basis over a period of a month. Although this method, combined with the sample design and the restructuring of the questions, is likely to deliver better results than the previous models, it does have the disadvantage of making this survey less comparable with its predecessors (Yu, 2008). This paper therefore refrains from making any cross survey comparisons and rather considers this survey in isolation.

3. Poverty

3.1 FGT Indices

The normalized Foster-Greer-Thorbecke (FGT) index, proposed by Foster, Greer and Thorbecke in 1984, is used throughout the poverty analysis in this paper. The index's monotonicity, flexibility and its distributional sensitivity axioms render it by far the most frequently used poverty index. In addition to the aforementioned characteristics, the FGT measure is also additively sub-group

decomposable. This attribute will be applied in the next section in which poverty is decomposed across various subgroups of the South African population.

The FGT measure is formally formulated as

$$p(\alpha) = \frac{1}{n}\sum_{i=1}^{q}\left[\frac{z - y_i}{z}\right]^{\alpha}$$

In this model, *n* is the population size, *z* is the poverty line, *q* is the number of people falling below this poverty line, y_i is the income of the i^{th} person and α is the poverty parameter. By allowing the poverty parameter α to vary, it is possible to investigate different aspect of poverty. For the purpose of this paper, α takes the values of 0, 1 and 2.

Setting G_i equal to the income shortfall ($z - y_i$) of the i^{th} person (j = 1,2,…,q), the 3 FGT-indices (for α=0, 1 and 2 respectively) are

$$p(0) = \frac{1}{n}\sum_{i=1}^{q}\left[\frac{G_i}{z}\right]^{0} = \frac{q}{n} \qquad \text{(headcount measure)}$$

$$p(1) = \frac{1}{n}\sum_{i=1}^{q}\left[\frac{G_i}{z}\right]^{1} = \frac{q}{n}\frac{\bar{G}_i}{z} \qquad \text{(poverty gap measure)}$$

$$p(2) = \frac{1}{n}\sum_{i=1}^{q}\left[\frac{G_i}{z}\right]^{2} \qquad \text{(squared poverty measure)}$$

Table 2 presents the results obtained from an application of the FGT measures just described at the three official poverty lines currently in use in South Africa[3] (R2532, R3864 and R7116) to the 2005 IES data.

TABLE 2: Poverty by FGT indices and poverty line

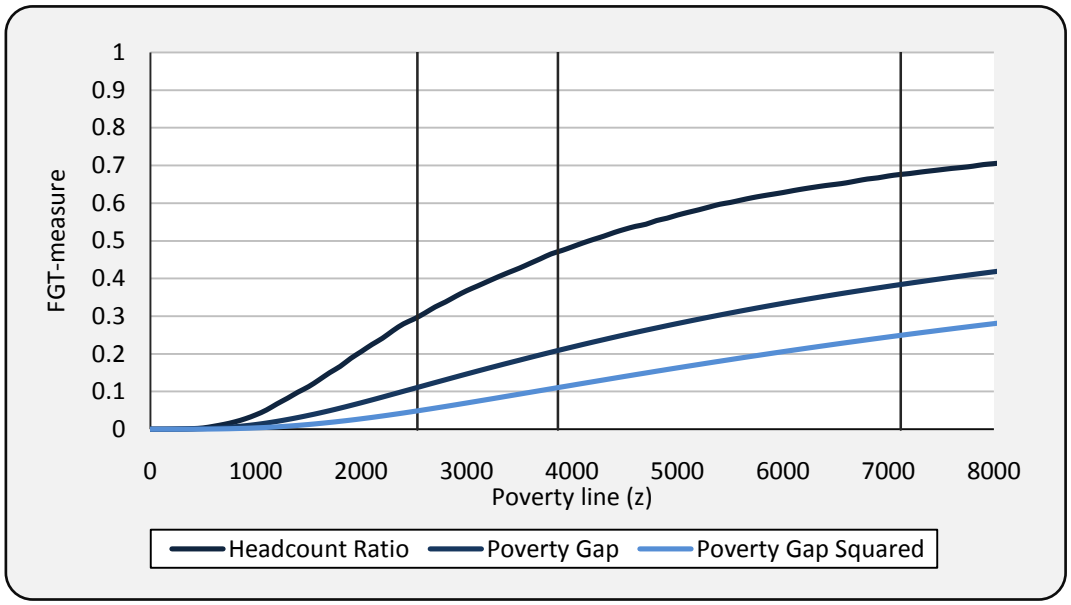
	$z = 2532$		$z = 3864$		$z = 7116$	
$\alpha = 0$	0.297	*(0.005)*	0.471	*(0.006)*	0.676	*(0.005)*
$\alpha = 1$	0.103	*(0.002)*	0.202	*(0.003)*	0.380	*(0.004)*
$\alpha = 2$	0.049	*(0.001)*	0.110	*(0.002)*	0.249	*(0.003)*

Source: Own calculations using IES2005

The results are represented graphically in figure 2. The figure illustrates the magnitude of the poverty measures at any possible poverty line, and how poverty varies according to the poverty line in use.

[3] all prices are annual per capita income and at constant 2000 prices

FIGURE 2: FGT curves with *α = 0, 1, 2*.



Source: Own calculations using IES2005

3.2 Decomposition by Group

In this subsection poverty is decomposed by race and educational attainment[4].

a) Race

Table 3 presents the results obtained when poverty was decomposed according to race.

TABLE 3: Decomposition of FGT measures by Race

	Population	Subgroup FGT			Poverty Shares		
	Share	$\propto = 0$	$\propto = 1$	$\propto = 2$	$\propto = 0$	$\propto = 1$	$\propto = 2$
African	79%	0.552	0.239	0.068	93%	94%	95%
	(0.005)	*(0.018)*	*(0.008)*	*(0.002)*	*(0.004)*	*(0.004)*	*(0.005)*
Coloured	9%	0.346	0.132	0.013	6%	6%	5%
	(0.003)	*(0.023)*	*(0.011)*	*(0.005)*	*(0.001)*	*(0.001)*	*(0.005)*
Indian	2%	0.078	0.022	0.000	0%	0%	0%
	(0.002)	*(0.002)*	*(0.000)*	*(0.009)*	*(0.000)*	*(0.000)*	*(0.002)*
White	9%	0.004	0.001	0.084	0%	0%	0%
	(0.003)	*(0.007)*	*(0.004)*	*(0.000)*	*(0.008)*	*(0.009)*	*(0.000)*

Source: Own calculations using IES2005

A simple headcount ratio (FGT measure with α = 0) indicates that poverty differs substantially across different race groups. The table indicates that roughly 55% of African South Africans fall below the poverty line of R3 864 per capita per year (2000 prices), while roughly 35%, 8% and less than 1% of coloured, Indian and white South Africans respectively fell below that poverty line.

A similar pattern is evident when the poverty gap (FGT with α=1) measure is used. Poverty was highest amongst African South Africans, followed by coloured, Indian and white South Africans respectively. The poverty gap ratios for African, coloured, Indian and white South Africans are 0.239,

[4] The data was also decomposed by gender of household head, province and type of area. However, it did not add much insight and was so it was omitted.

0.132, 0.022 and 0.001, respectively. From the algebraic notation above, it can be shown that the poverty gap measure is an expansion of the simpler headcount ratio. All individuals who fall below the poverty line were allocated equal weight for the headcount measure. However, in the case of the poverty gap measure, each individual was allocated a weight equal to the magnitude of the shortfall (G_i). Consequently, the measure is more sensitive to the severity of poverty and therefore provides a more nuanced indication of the extent of poverty within race groups.

The third index is more sensitive to the severity of poverty than the poverty gap measure just explained. By squaring the shortfall of each individual, individuals living in more severe poverty are weighted more heavily than those who lie closer to the poverty line. This index therefore places greater emphasis on the severity of poverty than the poverty gap measure. However, despite its algebraic appeal, this measure has the drawback of not being as interpretable as the previous two measures. The results attained for this measure confirm the general pattern indicated by the headcount ratio and the poverty gap ratio: that poverty is most severe amongst African South Africans, followed in turn by coloured, Indian and white South Africans.

The last 3 columns present a breakdown of total poverty among the four race groups. If poverty was equally distributed among the different race groups (so that the same proportion of people in each race group lived below the poverty line) we would have expected the poverty shares of each race group to be similar to the population shares of each race group. However, this was not the case. While Africans accounted for 79% of the South African population,they constitute 93% of the poor. Interestingly, the poverty share Africans increased to 94% if the poverty gap measure was used, and to 95% if poverty gap squared measure was used. Therefore, as the poverty measure became increasingly sensitive to the severity of poverty, the poverty share of the African group became larger, indicating that Africans experience greater poverty relative to other race groups both in terms of incidence and severity. Decomposing poverty by race group therefore illustrates that poverty was not only more common among Africans, but also more severe.

In contrast, the poverty share of coloureds decreased as the sensitivity to the severity of poverty increased across the poverty measures. Neither the Indian nor the white population feature amongst South Africa's poor. South African poverty is therefore largely an African and coloured phenomenon.

b) Educational Attainment (of household head)

In a similar manner as above, poverty was decomposed by the level of education attained by the household head.

TABLE 4: Decomposition of FGT measures by Educational Attainment of the Respondent

	Population	Subgroup FGT			Poverty Shares		
	Share	$\propto = 0$	$\propto = 1$	$\propto = 2$	$\propto = 0$	$\propto = 1$	$\propto = 2$
No Schooling	0.188	0.763	0.370	0.157	30%	34%	41%
	(0.004)	*(0.011)*	*(0.006)*	*(0.005)*	*(0.008)*	*(0.009)*	*(0.010)*
Incomplete Primary	0.221	0.647	0.284	0.084	30%	31%	32%
	(0.005)	*(0.010)*	*(0.004)*	*(0.005)*	*(0.008)*	*(0.009)*	*(0.010)*
Incomplete Secondary	0.371	0.430	0.165	0.025	34%	30%	25%
	(0.005)	*(0.011)*	*(0.004)*	*(0.003)*	*(0.003)*	*(0.003)*	*(0.010)*
Matric	0.131	0.162	0.053	0.005	4%	3%	2%
	(0.004)	*(0.008)*	*(0.004)*	*(0.002)*	*(0.001)*	*(0.001)*	*(0.003)*

Matric + Diploma	0.052	0.032	0.011	0.000	0%	0%	0%
	(0.002)	*(0.002)*	*(0.000)*	*(0.002)*	*(0.000)*	*(0.000)*	*(0.001*
Degree	0.033	0.003	0.000	0.000	0%	0%	0%
	(0.002)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*

Source: Own calculations using IES2005

The headcount ratio indicates that poverty was highest amongst the portion of the population where the household head had no schooling (approximately 76% of this group fall below the poverty line), becoming smaller for groups with progressively higher level of educational attainment (roughly 64% amongst the groups with incomplete primary schooling, 43% for the groups with incomplete secondary schooling, 16% for those who have completed Matric, 3% of those with post-secondary schooling and less than 1% for graduates). A similar trend was observed when the poverty gap and poverty gap squared measures were used.

Although it is unlikely that educational attainment alone is responsible for the large disparity in poverty levels between the different levels of education, it is interesting that (ignoring everything else) an increase in educational attainment of the household head decreased a household's likelihood of being impoverished.

The relative difference among the three poverty measures is most easily observed by comparing the poverty shares they produce. The poverty share of people living in households where the household head has no schooling increases for measures which use higher values of α (measures more sensitive to the severity of poverty), indicating that poverty is more severe in this group relative to the other groups. In the case of those with incomplete secondary schooling, the poverty share decreases for higher values of α in the FGT poverty measure, indicating that poverty is less severe for this group. The change in the poverty shares of these two groups therefore indicates that if the poverty line had been drawn at a lower level of income, the poverty shares of the groups would shift from those with incomplete secondary education to those with no schooling.

3.3 Decomposition by Income Source

This subsection investigates the relative importance of each different income source in poverty alleviation. The IES data allow for the disaggregation of income data into different income sources (or components). There were 23 **c**omponents in total. These 23 components were aggregated into 8 groups[5] considered important for this analysis. These are presented in table 5 below.

TABLE 5: Income Components

	Income Share
Wages	71%
Self-Employment	11%
Rent & Royalties	1%
Social Grants	7%
Allowances	3%
Remittances	2%
Other	5%
Total	100%

Source: IES2005

[5] See appendix for complete explanation.

It may be assumed that, on average, the components that account for a larger portion of total income would play a larger role in pushing households closer to or over the poverty line. Although this assumption seems to make sense, the relationship is more complex. Simply taking the mean of each component as a crude measure of its relative impact on poverty alleviation is insufficient, since it fails to incorporate the different distributional effects among the components. In other words, the income share of each component in the income of different individuals is not identical for all individuals, or income components are not distributed in the same way for different individuals.

Duclos & Araar (2006) developed an algorithm that overcomes this problem. Rather than attempting to gauge the direct impact of each income component on poverty alleviation, they investigate the level of poverty that would have existed in the absence of this income source in overall income.

They propose the testing of the marginal effect that each component has on poverty alleviation by comparing the FGT indices against what they would have been in the absence of a specific source of income. Although this method appears straightforward – simply calculating the drop in the poverty index that is due to the inclusion of an additional income source – it is not. The fact that the marginal effect of each component is largely dependent on the order in which different income components are included in the model is potentially problematic. Duclos and Araar (2006) circumvent this path-dependency problem by making use of a Shapley-value. Instead of calculating the effect of a specific income component on a predetermined subset of income components, the Shapley-value calculates the average marginal effect of that component over all possible income subsets (including the empty subset). The results of applying this method are presented in table 5 below.

TABLE 5: Decomposing Poverty by Income Source

		Absolute Contribution to Poverty			Relative Contribution to Poverty			Elasticity of Poverty to a 1% change in income components		
	Income Share	α=0	α=1	α=2	α=0	α=1	α=2	α=0	α=1	α=2
Wages	71%	-0.354	-0.414	-0.424	71%	55%	50%	1.00	0.77	0.70
Self-Employed	11%	-0.041	-0.056	-0.062	8%	7%	7%	0.76	0.69	0.67
Rent & Royalties	1%	-0.004	-0.006	-0.006	1%	1%	1%	0.63	0.58	0.58
Social Grants	7%	-0.047	-0.176	-0.231	9%	23%	27%	1.42	3.51	4.09
Allowances	3%	-0.017	-0.021	-0.023	3%	3%	3%	1.12	0.93	0.88
Remittances	2%	-0.012	-0.037	-0.047	3%	5%	5%	1.41	2.74	3.09
Other	5%	-0.021	-0.046	-0.060	4%	6%	7%	0.82	1.18	1.36
Total	100%				100%	100%	100%	1.00	1.00	1.00

Source: Own calculations using IES2005

Because income alleviates poverty, the marginal effect of each income component on each of the poverty measures is expected to be negative – a finding confirmed by the results presented in table 5. On average, wages had the greatest absolute effect on poverty. At the mean, wages decreased the poverty headcount ratio by approximately 35%, by far the largest of any income component. Self-employment income decreased the headcount poverty ratio by 4.1% and social grants by 4.7%.

The relative contribution of each component to poverty is also reported in table 5. Although these proportions appear similar to the total income share, some noticeable dissimilarities exist. These dissimilarities highlight the different distributional compositions among the components, highlighting the reason why a simple income share comparison would not suffice.

The relative contributions to the poverty headcount ratio and the relative income shares are identical for wages, both lying at 71%. Other income sources differ somewhat, but never by more than 3 percentage points. However, in the case of social grants the share of the impact on the headcount ratio is higher than its income share.

As the "sensitivity" of the poverty measure increases (i.e. as the poverty measure takes greater account of the severity of poverty), the gap between the income share of the component and the impact that it has on the headcount ratio becomes larger. The relative contribution that social grants make to poverty alleviation increases substantially as the sensitivity of the poverty measure to the severity of poverty increases. Using the poverty squared gap ratio, social grants account for 27% of the contribution, despite the fact that they constitute just 7% of overall income. By comparison, the relative role played by wages in decreasing the poverty gap squared ratio is 50%. Wages constitute 71% of overall income. These two sources therefore differ by a factor of 10 in their contribution to overall income, only the contribution of wages to poverty alleviation (taking the severity of poverty into account) is twice as big as that of social grants.

Therefore, although larger income components still have a larger overall influence on poverty alleviation, smaller components are often more effective in pushing lower-earning individuals towards or closer to the poverty relative to their share in overall income, particularly in the case of social grants.

To illustrate this, an "elasticity" measure is constructed, which measures the relative size of each component in monetary terms to the relative contribution each component has on poverty alleviation. The measure is calculated as

$$E_i = \frac{relative\ effect\ on\ poverty\ of\ income\ source\ i}{relative\ size\ of\ income\ source\ i}$$

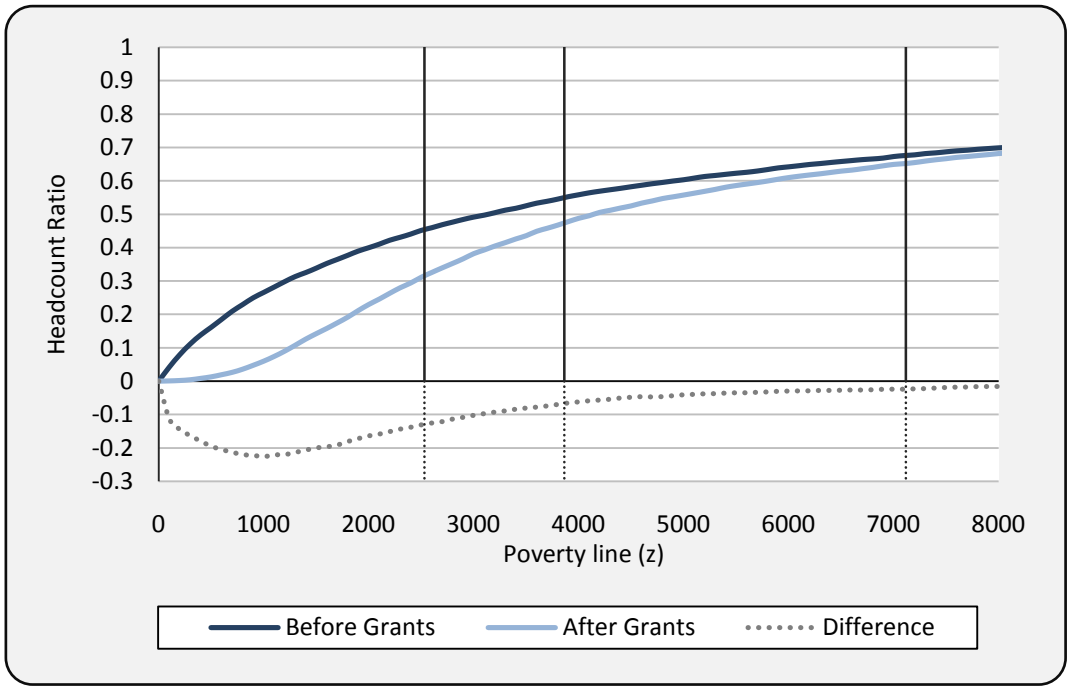
These elasticity-measures (added to the final column of table 5) differ greatly across income components. Not surprisingly, the social-grants-component is the most efficiently targeted, with an elasticity measure of 1.42 for the headcount ratio, followed closely by remittances, with a value of 1.41. This value increases dramatically for poverty measures which control for the severity of poverty, illustrating the value of social grants in improving the situation of the most impoverished. For the poverty gap measure social-grants has an elasticity-value of 3.51 - much larger than that for wages (0.77). For the poverty gap squared measure, the gap between the contribution of social grants and wages to poverty alleviation increases to a factor of 6. This implies that in terms of impact on poverty alleviation, each R1 government spends on poverty alleviation through social grants is 6 times more effective than the average R1 earned through the conventional labor-market in terms of poverty, which we know to be heavily skewed and exclusive.

Despite the fact that this a-theoretical decomposition method used above provides a fair way of comparing a range of income components, it is unclear as to whether this method is ideal for the analysis of the effect of any one specific income source, particularly if we have some knowledge of the ordering of these income components. Indeed, this seems to be the case with social grants. Social grants are means-tested, rendering it is reasonable to assume that they are only allocated after individual is unsuccessful in attaining a sufficient income without receiving grants. This section

assumes that this is true and that social grants are therefore the last possible source of income obtained by individuals. This simplifying assumption makes it possible to investigate the effect of social grants by comparing only total income to what total income would have been in the absence of social grants. The assumption that social grants to now result in any behavioral change was made, although it is acknowledged that this is not entirely accurate.

Figures 3, 4 and 5 present the FGT curves before and after controlling for social grants. The dotted line below the x-axis indicates the impact of social grants on poverty alleviation.

FIGURE 3: Poverty Headcount Ratio (α=0) for different poverty levels



Source: Own calculations using IES2005

TABLE 6: Effect of Social Grants on Poverty (α = 0)

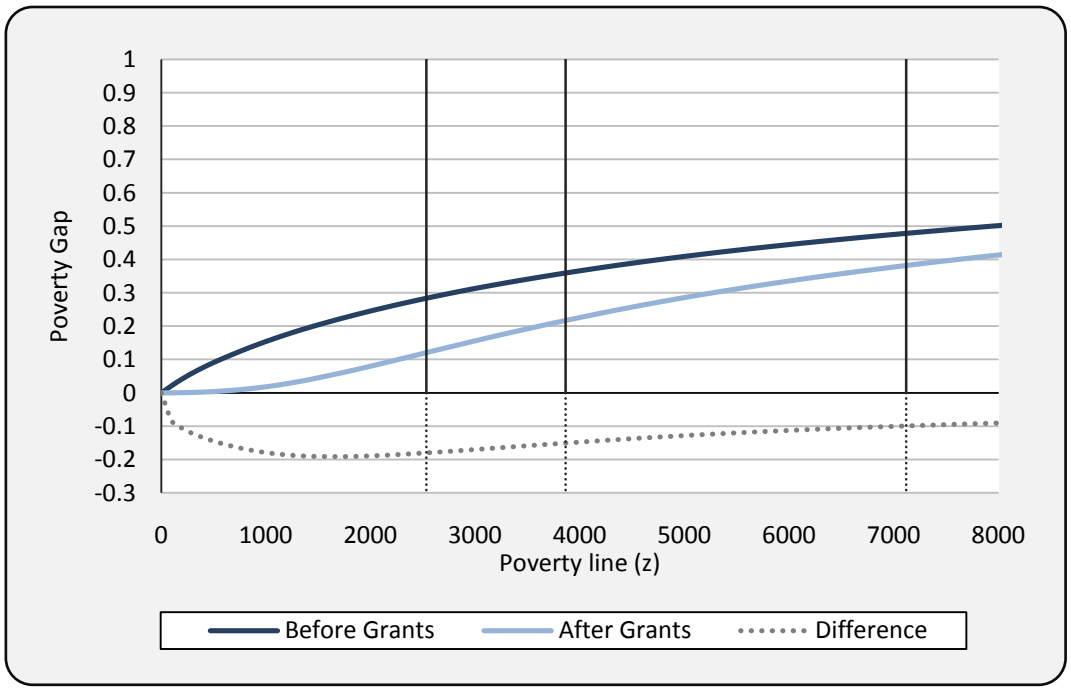
	Poverty Line					
	R2532		R3864		R7116	
Before Social Grants	0.455	*(0.006)*	0.550	*(0.006)*	0.676	*(0.005)*
After Social Grants	0.316	*(0.005)*	0.473	*(0.006)*	0.653	*(0.005)*
Difference	-0.138	*(0.004)*	-0.077	*(0.003)*	-0.024	*(0.002)*

Source: Own calculations using IES2005

Figure 3 indicates that the impact of social grants diminishes as the poverty line is drawn at higher levels of income. This is confirmed by table 6, which presents the data on the impact of social grants at the three experimental poverty lines employed by Statistics South Africa (StatsSA). It may be seen that at a poverty line of R2 532 per person per year (2000 prices), the poverty headcount ratio decreases from roughly 45% to approximately 32%, indicating that social grants decreased the incidence of poverty by roughly 13 percentage points. At a poverty line of R3 864 per person per year (2000 prices), social grants decreased the incidence of poverty by slightly less than 8 percentage points, and at a poverty line of R7 116 per person per year (2000 prices), social grants decreased the poverty headcount ratio by slightly more than 2 percentage points. Social grants therefore appear to have been more effective in diminishing the proportion of population who fell below the poverty line

at lower poverty lines – an indication that social grants were most effective for individuals experiencing relatively severe poverty.

FIGURE 4: Poverty Gap (α=1) Measure for different poverty levels



Source: Own calculations using IES2005

TABLE 7: Effect of Social Grants on Poverty (α = 1)

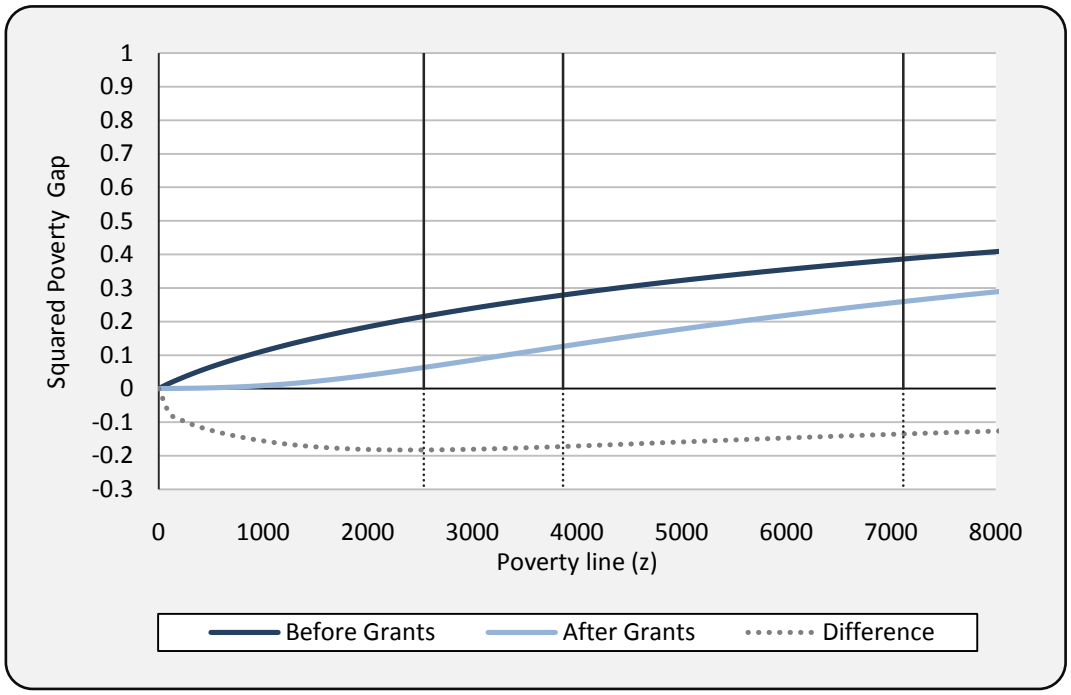
	Poverty Line					
	2532		3864		7116	
Before Social Grants	0.284	*(0.004)*	0.360	*(0.004)*	0.479	*(0.004)*
After Social Grants	0.121	*(0.002)*	0.217	*(0.003)*	0.382	*(0.004)*
Difference	-0.163	*(0.003)*	-0.143	*(0.002)*	-0.097	*(0.001)*

Source: Own calculations using IES2005

The impact of social grants on poverty measured using the poverty gap ratio indicates that the severity of poverty was somewhat reduced after social grants. Importantly, the reduction in this poverty measure was greatest at the R2 532 per person per year poverty line, followed in turn by the R3864 per person per year poverty line and the R7116 per person per year line – a further indication of the effectiveness of social grants in targeting the poorest in society.

The difference between pre- and post-social grant poverty was confirmed when the poverty gap squared ratio was used.

FIGURE 5: Squared Poverty Gap Measure (α=2) for different poverty levels



Source: Own calculations using IES2005

TABLE 8: Effect of Social Grants on Poverty (α = 2)

	Poverty Line					
	2532		3864		7116	
Before Social Grants	0.208	*(0.004)*	0.279	*(0.004)*	0.386	*(0.004)*
After Social Grants	0.063	*(0.002)*	0.126	*(0.002)*	0.260	*(0.003)*
Difference	-0.152	*(0.003)*	-0.153	*(0.002)*	-0.126	*(0.002)*

Source: Own calculations using IES2005

Figure 5 and Table 8 illustrate that the impact of social grants on poverty became less dependent on the location of the poverty line as the measure employed became more sensitive to the severity of poverty. This gap between the before and after social grant indices was more persistent.

The distinction between the percentage point and percentage change is worth noting at this point (and may further illustrate the effectiveness with which social grants target the most severe poverty). Referring to table 6, at a poverty line of R2 532 per person per year, social grants decreased the poverty headcount ratio by roughly 14 percentage points. However, this 14 percentage point drop in poverty affectted roughly 46% of the population (those who would have been in poverty without social grants). Therefore, by decreasing the headcount ratio from 46% to 32%, social grants pushed 31% of the poor (at the relevant poverty line) over the poverty line. If the poverty line is drawn at R3 864 per person per year, social grants pushed roughly 13% (7% of 55% who would have been in poverty) of the poor out of poverty, and if the poverty line is drawn at R7 116 per person per year, roughly 3% of the poor were pushed over the poverty line by social grants. Using changes in percentage points to investigate the impact of social grants on poverty illustrates their true ability to alleviate poverty. Indeed, percentage changes alone clearly underestimate the impact of social grants in poverty alleviation.

4. Inequality

4.1 GE Indices

This section makes use of the Generalised Entropy index to measure and decompose inequality. This measure is formulated as

$$GE(\sigma) = \frac{1}{n(\sigma^2 - \sigma)}\left[\sum_{j=1}^{n}\left(\frac{y_i}{\mu}\right)^{\alpha} - 1\right]$$ [6]

In this model, *n* is the population, u is the mean income, and poverty α is the sensitivity parameter. As with the FGT measure, varying the value of α parameter changes the GE measurement's sensitivity to specific parts of the distribution. For α close to zero, prevalence is given to those at the lower end of the income distribution. For α=1 (Theil-index), the index is equally sensitive across the entire distribution. For α> 1, prevalence is given to those at top end of the distribution (Shorrocks, 1984).

Formally the 3 models are

$$GE(0) = \frac{1}{n}\sum_{j=1}^{n}\ln\left(\frac{\mu}{y_i}\right) \qquad \text{(mean logarithmic deviation)}$$

$$GE(1) = \frac{1}{n}\sum_{j=1}^{n}\left[\frac{y_i}{\mu}\right]\ln\left(\frac{y_i}{\mu}\right) \qquad \text{(Theil index)}$$

$$GE(2) = \frac{1}{2}V(\frac{y_i}{\mu})\sum_{j=1}^{n}\left[\frac{y_i}{\mu}\right]\ln\left(\frac{y_i}{\mu}\right) \qquad \text{(half the square of the coefficient of variation)}$$

4.2 Decomposition by Group

Although the Generalized Entropy (GE) measures are less widely used than the Gini coefficient, they provide more flexible options. As with the FGT index, the GE indices have the desirable attribute of being additively sub-group decomposable. Furthermore, the GE measures also allow for the comparison of the relative extent of inequality within groups as well as for the comparison of the magnitude of these combined effects with the extent of inequality that exists between the different groups. This attribute is illustrated in table 9 below.

[6] The literature on the General Entropy measure generally uses an α symbol instead of the σ used in the formula in this paper. The symbol σ has been used in order to avoid possible confusion with the α used in the previous section in the FGT poverty measures.

TABLE 9: Decomposition of inequality by group using the GE measure and σ=0,1 and 2

	Group	Pop. Shares	Estimate $\sigma=0$		$\sigma=1$		$\sigma=2$		Relative Contribution $\sigma=0$		$\sigma=1$		$\sigma=2$	
	Total	100%	0.890	*(0.016)*	1.001	*(0.024)*	2.648	*(0.184)*	1.001		1.001		1.001	
Race	Between Race		0.358	*(0.008)*	0.484	*(0.006)*	0.823	*(0.005)*	0.402		0.483		0.311	
	Within Race		0.532	*(0.010)*	0.518	*(0.025)*	1.825	*(0.185)*	0.598		0.517		0.689	
	African	79%	0.545	*(0.011)*	0.648	*(0.017)*	1.474	*(0.081)*	0.486	*(0.012)*	0.270	*(0.014)*	0.122	*(0.011)*
	Coloured	9%	0.595	*(0.027)*	0.626	*(0.029)*	1.087	*(0.084)*	0.059	*(0.003)*	0.049	*(0.004)*	0.028	*(0.004)*
	Indian	2%	0.504	*(0.062)*	0.543	*(0.086)*	1.077	*(0.326)*	0.014	*(0.002)*	0.024	*(0.005)*	0.033	*(0.011)*
	White	9%	0.375	*(0.020)*	0.380	*(0.025)*	0.589	*(0.062)*	0.039	*(0.002)*	0.174	*(0.010)*	0.505	*(0.029)*
Gender	Between Gender		0.072	*(0.000)*	0.066	*(0.001)*	0.063	*(0.001)*	0.081		0.066		0.024	
	Within Gender		0.818	*(0.012)*	0.935	*(0.024)*	2.585	*(0.184)*	0.919		0.934		0.976	
	Male	56%	0.897	*(0.019)*	0.933	*(0.028)*	2.183	*(0.178)*	0.570	*(0.012)*	0.690	*(0.015)*	0.800	*(0.026)*
	Female	43%	0.715	*(0.024)*	0.941	*(0.039)*	3.022	*(0.333)*	0.349	*(0.000)*	0.243	*(0.017)*	0.176	*(0.022)*
Province	Between Province		0.108	*(0.001)*	0.110	*(0.001)*	0.117	*(0.001)*	0.122		0.110		0.044	
	Within Province		0.782	*(0.024)*	0.891	*(0.024)*	2.531	*(0.184)*	0.878		0.890		0.956	
	Western Cape	10%	0.973	*(0.006)*	0.960	*(0.017)*	2.086	*(0.311)*	0.109	*(0.006)*	0.179	*(0.017)*	0.275	*(0.042)*
	Eastern Cape	14%	0.732	*(0.006)*	0.898	*(0.008)*	2.571	*(0.532)*	0.119	*(0.006)*	0.086	*(0.008)*	0.062	*(0.013)*
	Northern Cape	2%	0.702	*(0.001)*	0.822	*(0.001)*	1.924	*(0.151)*	0.019	*(0.001)*	0.013	*(0.001)*	0.008	*(0.001)*
	Free State	6%	0.784	*(0.003)*	0.869	*(0.006)*	1.953	*(0.233)*	0.055	*(0.003)*	0.058	*(0.006)*	0.053	*(0.008)*
	KwaZulu-Natal	21%	0.805	*(0.009)*	0.978	*(0.012)*	2.669	*(0.360)*	0.190	*(0.009)*	0.135	*(0.012)*	0.092	*(0.015)*
	North West	7%	0.778	*(0.004)*	0.866	*(0.006)*	2.557	*(0.661)*	0.061	*(0.004)*	0.051	*(0.006)*	0.048	*(0.011)*
	Gauteng	20%	0.788	*(0.007)*	0.822	*(0.017)*	1.755	*(0.215)*	0.179	*(0.007)*	0.269	*(0.017)*	0.352	*(0.039)*
	Mpumalanga	7%	0.824	*(0.006)*	1.020	*(0.009)*	2.835	*(0.387)*	0.069	*(0.006)*	0.055	*(0.009)*	0.043	*(0.010)*
	Limpopo	11%	0.609	*(0.004)*	0.793	*(0.005)*	2.378	*(0.364)*	0.078	*(0.004)*	0.044	*(0.005)*	0.024	*(0.004)*
Area	Between Area		0.171	*(0.001)*	0.142	*(0.002)*	0.126	*(0.002)*	0.192		0.142		0.047	
	Within Area		0.719	*(0.012)*	0.859	*(0.024)*	2.523	*(0.184)*	0.808		0.858		0.953	
	Urban	59%	0.836	*(0.017)*	0.870	*(0.025)*	1.920	*(0.147)*	0.554	*(0.007)*	0.727	*(0.008)*	0.860	*(0.021)*
	Rural	41%	0.550	*(0.019)*	0.806	*(0.045)*	3.762	*(0.697)*	0.254	*(0.010)*	0.132	*(0.011)*	0.093	*(0.017)*
Education	Between Education		0.417	*(0.006)*	0.462	*(0.006)*	0.679	*(0.010)*	0.473		0.465		0.260	
	Within Education		0.473	*(0.010)*	0.540	*(0.024)*	1.969	*(0.184)*	0.527		0.535		0.740	
	No Schooling	19%	0.341	*(0.025)*	0.443	*(0.052)*	1.123	*(0.273)*	0.072	*(0.006)*	0.022	*(0.003)*	0.006	*(0.001)*
	Incomplete Pri	22%	0.357	*(0.015)*	0.421	*(0.024)*	0.834	*(0.100)*	0.089	*(0.004)*	0.033	*(0.003)*	0.008	*(0.001)*
	Incomplete Sec	37%	0.538	*(0.019)*	0.633	*(0.035)*	1.542	*(0.255)*	0.224	*(0.009)*	0.159	*(0.013)*	0.099	*(0.017)*
	Matric	13%	0.674	*(0.026)*	0.675	*(0.039)*	1.374	*(0.188)*	0.099	*(0.005)*	0.170	*(0.013)*	0.252	*(0.033)*
	Matric&Diploma	5%	0.504	*(0.035)*	0.477	*(0.044)*	0.776	*(0.155)*	0.029	*(0.002)*	0.085	*(0.010)*	0.180	*(0.034)*
	Degree	3%	0.373	*(0.033)*	0.356	*(0.036)*	0.496	*(0.076)*	0.014	*(0.001)*	0.066	*(0.008)*	0.195	*(0.031)*

Source: Own calculations using IES2005

Interesting to note is the relative contribution of various groups to inequality in South Africa. Decomposing inequality into its within- and between-group components in terms of race illustrates that when σ=0, inequality was driven primarily by within-group inequality, with this component increasing for higher values of σ (i.e. as the measure becomes more sensitive to people at the higher end of the income distribution). This indicates that within-group inequality was increasing as a result of people at the top end of the income distribution earning increasingly higher wages relative to those at the lower end – most likely a reflection of a rising African middle-class. The same pattern was observed across all dimensions along which inequality was decomposed, again reiterating the fact that inequality in South Africa was driven by higher earnings of those at the top of the income distribution.

The increase in the within-group component of inequality along the lines of education was substantial, especially as the value of σ changed from 1 to 2 – an increase from 53.5% to 74.0%. This

indicates the role of education in increasing earnings and therefore the role that education may play in perpetuating inequality in society (with only those at the top end of the income distribution being able to invest in the type of education that would result in increased earnings, therefore perpetuating the correlation between income and education). However, in the case of race, gender, provinces, area and education, the within-group component of inequality contributed more to overall inequality than the between-group component.

4.3 Decomposition by Source

Inequality may also be decomposed across income components, allowing for the investigation of the contribution of various income sources to inequality. Unfortunately, the correlations between the components rendered only one of the GE-indices useful for the decomposition of inequality into income components: half the square of the coefficient of variation (σ=2). The results for this decomposition using a method proposed by Shorrocks (1982) are presented in table 10 below.

TABLE 10: Decomposition of inequality by income source using the GE(2) measure

Source	Population Ratio	Absolute Contribution		Relative Contribution	
Wages	69%	3.278	(0.505)	69%	(0.058)
Self-Employed	10%	0.747	(0.159)	16%	(0.038)
Rent & Royalties	1%	0.124	(0.054)	3%	(0.011)
Social Grants	10%	-0.024	(0.006)	-1%	(0.001)
Allowances	3%	0.051	(0.010)	1%	(0.002)
Remittances	2%	0.005	(0.003)	0%	(0.001)
Other	5%	-0.279	(0.279)	12%	(0.051)
Total	100%	3.903		100%	

Source: Own calculations using IES2005

Table 10 presents the proportion of total income constituted by various income sources. It is clear that wages constitute the largest percentage of income, even though wages are received by only a small proportion of the population (given the prominence of unemployment in the South Africa labour market). The relative contribution of these various income sources (reported in the last column of the table) indicates the role that each of these components of income play in driving inequality. It is obvious that wages play by far the most prominent role, again emphasizing the prominence of higher income earners in driving inequality.

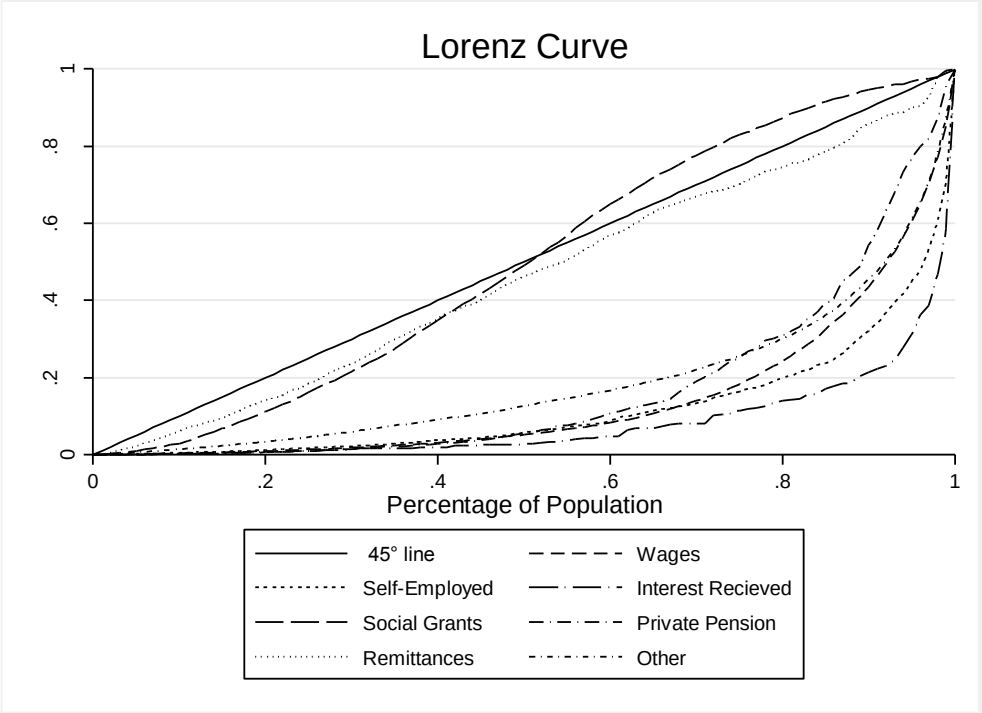
For the sake of this analysis it is important to note that social grants played a largely negligible role in remedying inequality. The negative sign indicates that social grants served to diminish inequality, but by a largely inconsequential amount. Therefore, despite the fact that some 10% of overall income may be attributed to social grants, they did little to decrease income inequality.

Again, this reiterates the fact that using the GE(2) measure, inequality was driven predominantly by high income earners and so while social grants may be effective in alleviating the level of poverty experienced by people at the bottom of the income distribution, they were unlikely to be effective in easing the level of inequality in society as a whole.

The Lorenz curve plots the cumulative percentage of the population receiving the cumulative percentage of overall income by income source. The population was ranked from poorest to richest in terms of per capita income along the x-axis. A perfectly equal distribution of income would have

therefore been represented by the 45° line. An unequally distributed income source would have indicated that a large proportion of the overall population received a small percentage of income from a particular income source and so a large proportion of the Lorenz curve would fall below the 45 ° line. In other words, an unequal distribution would have been a distribution in which a large share of the population only received a small share of the income component in question. On the other hand, an income components that diminished inequality would be an income source with a large magnitude, received by a large proportion of the population and would lie above the 45° line. In other words, a small proportion of the population would receive a large component of the inequality-diminishing income component.

FIGURE 6: Lorenz Curve measuring the relative inequality within every income source



Source: Own calculations using IES2005

From the Lorenz curves in figure 6, it may be seen that social grants were the only source of income that served to diminish inequality since a large proportion of the population at lower levels of income received them. However, as discussed above, their impact was negligible given the fact that inequality was driven by high income earners (i.e. by people who did not receive social grants) and so the impact of social grants was unlikely to play any significant role in diminishing inequality.

5. Conclusion

The size and coverage of social grants in South Africa is indeed impressive. As mentioned before, social grants in South Africa compare favourably with developed countries and are considered impressive in comparison to those of other developing countries. Ironically, the apartheid roots of the social grants system have ensured that the system put in place is decidedly comprehensive and is effectively the extension of a system designed to keep a certain segment of the population (i.e. poor white people) out of abject poverty.

In 2009, South Africa's economic landscape is characterized by widespread poverty and inequality. Indeed, the extent of these phenomena renders the economic reality for a broad spectrum of society rather bleak. Social grants may be seen as a tool with which government may remedy the extent of economic hardship for its citizens.

This paper has shown that social grants were very effective in alleviating poverty. Furthermore, as the emphasis placed on the most impoverished in society increased, so too did the measure of the effectiveness of social grants in reducing poverty, indicating that South African social grants were well-targeted. It is important to mention that the impact that social grants have on household formation (i.e. people attaching themselves to households in which social grants are received as a source of income, particularly in the case of pensioners (Case and Deaton, 1996)) imply that social grants played an even greater role in the alleviation of poverty than was measured using the methods applied in this paper. Indeed, to the extent that social grants reach further than the individuals to whom they are allocated (through, for example, their impact on households formation), their role in poverty alleviation becomes increasingly important.

However, in terms of providing a remedy for inequality, social grants proved less useful. This is because inequality was driven primarily by high and rising incomes of people at the top end of the income distribution. It must be remembered that inequality measures place differential emphasis on the different portions of the income distribution and so measures that place the greatest emphasis on individuals at the top end of the income distribution produced a picture of more severe inequality in South Africa than those measures placing emphasis on individuals at the lower end of the income distribution. Social grants were targeted at the poorest members of the population and were implemented with the intention of pushing those living in poverty over the poverty line. It was therefore impossible for social grants to remedy inequality to the same extent that they remedied poverty, since relative to income of the population's top earners (i.e. the main drivers of inequality), the value of social grants was tiny. Therefore, although social grants were impressively effective in alleviating poverty, the same cannot be said for their role in terms of diminishing inequality.

Social grants were effective in pushing poor people closer to the poverty line, therefore providing some kind of relief from the misery characterizing poverty. However, in order to achieve any long term remedy to the situation of perpetual poverty and inequality, those living in poverty require a means to access higher levels of income on a sustainable basis. Social grants were unable to guarantee sustainable access to higher levels of income.

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