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THE POST-APARTHEID EVOLUTION OF EARNINGS INEQUALITY IN SOUTH AFRICA, 1995-2004

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ABSTRACT

This paper examines the trend in post-Apartheid earnings inequality in South Africa. By combining data sets, the paper is able to analyze the trend for the whole period 1995-2004. Earnings inequality rose sharply during 1995-1999 and then declined marginally, but remained high, during 2000-2004. A dramatic rise in unemployment was the driving force in exacerbating earnings inequality in the 1990s. Unemployment began to level off in the 2000s but remained at a high rate. An unprecedented influx of new entrants into the formal labour market in the 1990s put downward pressure on average real wages, affecting workers both in the middle of the distribution and toward the bottom. The growth of the South African economy has been neither rapid enough nor employment-intensive enough to absorb such a large influx of workers. Moreover, the economy's greater openness to trade and financial flows appears to have left many workers behind, especially Africans, workers in low-skilled occupations, residents of rural areas in general and poor regions in particular. Earnings inequality remains high across groupings of workers differentiated by race, education and occupation although occupation has become a more important factor than the other two in the 2000s. Differentials across the mean earnings of workers classified by rural and urban residence and by province have also intensified. In the 1990s, inequalities *within* groupings of worker rose sharply and then moderated by the 2000s. While earnings differentials by race and the rural-urban divide also exacerbated inequality in the 1990s, they have been in modest decline since then. These changes in the dynamics of earnings inequality between the 1990s and 2000s pose new challenges for South African policymakers in their efforts to substantially reduce the Apartheid legacy of high inequality and poverty.

Keywords: South Africa; Income Distribution; Earnings distribution; Inequality.

JEL Classification: D31, I32, N36, O15

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1 INTRODUCTION

In this paper, we describe the evolution of earnings inequality in South Africa from 1995 to 2004. Understanding earnings inequality is a major part of understanding the inequality of total income in South Africa since, as in many other countries, earnings are the main component of income. In the case of South Africa, the study of earnings inequality is even more important because few surveys have complete information on income while information on earnings is more widely available.

The study of earnings inequality is not exempt from problems, nor is it straightforward. South African data sources have been improving markedly since the end of Apartheid (1948-1994), but there are many unresolved issues. This implies that the results of this study, as well as the results of any other studies based on the same data sources, should be treated cautiously.

In addition to describing the general trends in earnings inequality, we attempt to shed light on how changes in population dynamics and the labour market have been determinants of the observed trends. The labour market and demography were intertwined in South Africa during 1995-2004. We explore, in particular, the rise in internal rural-urban migration and the pressure for inclusion in the labour market sought by Africans, women, and low-skilled workers. We postulate that these factors were likely to have driven up unemployment. This effect increased inequality by lowering the earnings of low-skilled workers towards the bottom of the distribution. Conversely, towards the top of the earnings distribution, high-skilled workers (who are relatively scarce) and new skilled entrants have enjoyed a rise in earnings. These trends are likely associated with an increasing skill bias in the labour market due to trade liberalization.

This introduction is followed by four sections of the paper. In the next section, we present the data sources and issues related to them, as well as the inequality measures and decompositions that will be deployed in the analysis. The third section provides an overview of the trends of income inequality between 1995 and 2000, the two points in time when reliable information on total income is available. We also present some trends in the labour market. This third section ends with a decomposition of income inequality by income sources, which provides some insights into how earnings inequality has affected the distribution of total household income. The fourth section is dedicated exclusively to analysing earnings inequality. It starts with the static and dynamic decompositions of one of the Generalized Entropy measures. Although the decompositions are independent—in the sense that each decomposition of the inequality measure for a specific partitioning of the population does not control for other effects—they still yield rich results. The fourth section ends with a brief exploration of correlations between trends in earnings inequality and changes in macroeconomic variables. A concluding section summarizes the main findings of the study.

2 DATA AND METHODS

Our main sources of data are surveys done by Statistics South Africa, the central statistics office of the country. We deploy data from the *October Household Survey* (OHS), which was fielded yearly between 1993 and 1999, and the biannual *Labour Force Survey* (LFS), which replaced the

OHS in 2000, and has been conducted in March and September. We also use data from the *Income and Expenditure Survey* (IES), which is carried out every five years (on a sub-sample of the closest OHS in time before 2000, and of the closest LFS from 2000 onwards). Since it provides a sub-sample of information, the IES can be merged with the OHS for 1995 or the LFS for 2000. The IES has the advantage of providing detailed data on income and expenditure. It can also provide population characteristics for households and individuals if it is combined with the OHS or the LFS. Whether alone or merged with other surveys, the IES has been widely used for analyzing poverty and inequality in South Africa based on income or consumption.

The use of different data sources raises questions about the comparability of statistics over time due to variations in sample design and conceptual changes. Definitional changes have strongly affected labour market statistics since the employment definition has changed over time. According to Statistics South Africa, the LFS started in 2000 was designed to capture all categories of employment more effectively than its predecessor, the OHS. The LFS questionnaire puts more emphasis on identifying workers in informal activities and in small-scale agriculture as employed even if they had spent only one hour on such activities in the past week. In comparing OHS 1999 and LFS March 2000 (the first round of the year), Statistics South Africa noticed that the LFS identified a significantly larger group of such workers than the OHS, which led it to count them as economically inactive rather than unemployed or employed. This conceptual change casts doubts on the reliability of the time series for unemployment.

However, these changes were not abrupt. The OHS itself had been subject to conceptual adjustments at least since its second round. Comparing OHS surveys, Muller and Posel (2004) showed that after 1996 there had been a prompt to interviewers to properly classify workers in informal activities and agriculture. Hence, own-account farmers and subsistence farmers should have been included in employment statistics after that year. But in 1997, the definition of the 'informal sector' changed. In light of these changes, some analysts, such as Kingdon and Knight (2005), have remained cautious about drawing conclusions on labour market dynamics in South Africa. These problems are unavoidable, however, if one is to use available South African data. Our working assumption is that despite these problems, they are not critical to tracking changes in inequality over time, which is the primary objective of our study.

A. INEQUALITY MEASURES

Although some of the properties of other measures of inequality might be more desirable, the Gini index has remained the most popular measure because of the ease with which it can be interpreted. It is the expected income gap (in percentage terms) between two individuals randomly selected from the population and is sensitive to income differences around the mode. The standard Gini index is defined by:

$$Gini = \frac{1}{2n^2y} \sum_{i=1}^n \sum_{j=1}^n |y_i - y_j|$$

For this study, we also use the Generalised Entropy class of indices (GE). They satisfy all desirable axioms of inequality measures: anonymity, the Pigou-Dalton transfer principle, scale invariance, population replication invariance, and decomposability. Assuming that $GE(\alpha)$

represents all GE measures, the parameter α is the weight given to the distance between incomes at different points of the income distribution. For lower values of α , the GE measure is more sensitive to changes in the lower tail of the distribution; and for higher values, it is more sensitive to changes in the upper tail. The three widely used GE inequality measures are:

$$GE(0) = \frac{1}{n} \sum_{i=1}^n \log \frac{\bar{y}}{y_i} \rightarrow \text{the mean log deviation or Theil - L;}$$

$$GE(1) = \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\bar{y}} \log \frac{y_i}{\bar{y}} \rightarrow \text{the Theil-T index; and}$$

$$GE(2) = \frac{1}{2n\bar{y}^2} \sum_{i=1}^n (y_i - \bar{y})^2 \rightarrow \text{half of the square of the Coefficient of Variation (CV).}$$

GE(0) and GE(1) do not accept zero values because it is not possible to take the logarithm of zero. The main difference between GE measures and the Gini index is that the Gini is less sensitive to how the population is stratified than to how individual values differ.

B. CATEGORICAL INCOME DATA

One of the problems that we confront in using South African data for our inequality measures is that some of the survey data on earnings are presented in categorical form. Alain Pichereau provides a method for resolving this problem for the Gini index based on the Lorenz Curve.¹

Despite having categorical data from some surveys, we can compute our inequality measures by setting the earnings of an individual as the average point of the interval to which he belongs. As a result, this new earnings variable can be used to compute each inequality measure by using the formulas presented in the previous section. Of course, such an inequality index is not the 'true' index but it is close in value. In order to identify how different the inequality measures could be, we conduct the following sensitivity test.

We use data on total household income from the Income and Expenditures Surveys for 1995 and 2000 to compute both the standard and the 'average-point' Gini index.² Between 1995 and 2000, the standard Gini increases from 0.648 to 0.673, i.e., an increase of 0.025 points (or four per cent). By using the 22 categories of income based on the OHS/LFS questionnaire and then generating a new variable for the average point of the group and assigning this to each family, we estimate that the 'average-point' Gini index increases from 0.644 to 0.678 between 1995 and 2000. This is a 0.034 point increase (or five per cent).

Thus, there is a similar trend although our 'average-point' Gini index tends to be higher. But this error might not affect our analysis because we are interested primarily in trends. Since we remain concerned about the validity of our final results, in section IV we will base our calculations for the standard Gini as well as all GE measures on the assumption that the categorical variable is continuous at its average point in order to make the time series of 1995-2004 comparable.

C. DECOMPOSITIONS OF THE GENERALIZED ENTROPY MEASURES

1. STATIC DECOMPOSITION

Generalized Entropy inequality indexes have the advantage—compared to the Gini coefficient—of being decomposable (statically) into sub-groups. For this study, we use nine characteristics of the heads of households to differentiate the population into the following sub-groups:

Age of household head i) under 25, ii) 25-34, iii) 35-44, iv) 45-54, v) 55-64 and vi) 65+ years;

Educational attainment of household head (i) illiterates or those with less than one year of schooling, (ii) 1-4 years, (iii) 5 to 7 years, (iv) 8 to 10 years, and (v) 11 or more years of schooling;

Gender of household head;

Race of household head i) African, ii) Coloured, iii) Indian/Asian iv) White, v) others;

Family type (i) 'single adult', (ii) 'couple, no kids', (iii) 'couple with 1 or 2 kids', (iv) 'single parent with children', and (v) 'elderly head of household';

Region – 9 provinces;

Urban/Rural location of household;

Employment Status (i) manager or professional, (ii) clerk or service worker, (iii) labourer (iv) other, (v) not working;

Sector of activities (i) agriculture, (ii) extraction, (iii) manufacturing, construction, trade or transport, (iv) financial, (v) government, education, health or other, (vi) not working.

The static decompositions separate total inequality I into a component of inequality *between* groups (I_b) (which is the explained component) and the residual inequality *within* groups (I_w) (which is the unexplained component).³ *Between-group* inequality, I_b , is defined by:

$$I_b = \frac{1}{\alpha^2 - \alpha} \left[\sum_{j=1}^k f_j \left(\frac{\mu(y_j)}{\mu(y)} \right)^\alpha - 1 \right]$$

Where $\mu(y_j)$ is the mean income, f_j is the population share, and v_j the income share of each sub-group $j, j=1,2,\dots,k$. and α is usually equal to 0, 1 or 2.

Cowell and Jenkins (1995) present a measure that gauges the weight of *between-group* inequality:

$$R_b = \frac{I_b}{I}$$

R_b is the proportion of inequality explained by a particular characteristic or set of characteristics. So, the *between-group* component is the part of total inequality that would arise if each person received the average earnings of the sub-group (e.g., male or female headed household) to which he belonged rather than his actual earnings. Another interpretation is that *between-group* inequality summarizes the proportion of inequality

that would remain if there were no inequality within each sub-group. In this case, an increase in the *between-group* component could imply some convergence of income of each category of a given sub-group.

2. DYNAMIC DECOMPOSITION

According to Ferreira, Leite and Litchfield (2006), the R_b term of the static decomposition presented above can be further disaggregated, using dynamic decomposition, into an effect due to changes in relative means (called an '*income effect*') and another two effects representing changes in the size of the sub-groups (called '*allocation effects*'). Hence, the dynamic decomposition has four components:

- The first term (*a*) captures the unexplained part of inequality, assuming a constant share of population sub-groups between t and $t+i$ times the observed GE(0) gap (this pure inequality effect is similar to *within-group* inequality);
- The second term (*b*) is an allocation effect, assuming that inequality within sub-groups is unchanged but that the shares of each category have changed. Hence, this is the effect of changes in population shares on the 'within-group' component of inequality;
- The third term (*c*) is another allocation effect that captures changes only in the shares of population sub-groups but on the assumption that the relative mean incomes are constant. Hence, this is the effect of changes in population shares on the relative mean earnings of the population sub-groups;⁴
- The final term (*d*) corresponds to the income effect because it captures all changes in mean incomes across sub-groups.

Mathematically, the dynamic decomposition developed by Mookherjee and Shorrocks (1982) and later adapted by Jenkins (1995) is defined by:⁵

$$\frac{\Delta GE(0)}{GE_t(0)} \cong \frac{1}{GE_t(0)} \cdot \left[\sum_{j=1}^k \overline{f_j} \Delta GE(0)_j \right] + \left[\sum_{j=1}^k \overline{GE(0)_j} \Delta f_j \right] + \left[\sum_{j=1}^k [\overline{\lambda_j} - \log \lambda_j] \Delta f_j \right] + \left[\sum_{j=1}^k (\overline{v_j} - \overline{f_j}) \Delta \log(\mu(y_j)) \right]$$

Where Δ is the difference operator, f_j is the population share of sub-group j , λ_j is the mean income of sub-group j relative to the overall mean, i.e., $\mu(y_j)/\mu(y)$, and the overbar indicates an average value for the variable between the initial and final periods. The first term is designated as *a*, the second as *b*, the third as *c* and the last one as *d*.

Unfortunately, each sub-group used in both static and dynamic decompositions is independent of the others. Thus, the decompositions do not allow us to control for the effect of other attributes of households when we focus on one particular attribute. For example, some of the income effect between racial sub-groups could be correlated with income effects between educational sub-groups or income effects between households in rural and urban

location. According to Ferreira, Leite and Litchfield (2006), the inability to control for such correlations is one reason why these types of inequality decompositions are merely suggestive of the causal factors underlying distributional dynamics.

3 INCOME INEQUALITY IN SOUTH AFRICA: AN OVERVIEW

A. TRENDS IN INCOME INEQUALITY AND OTHER WELL-BEING MEASURES

South Africa is one of the most unequal countries in the world. Its Gini index for *per capita* income distribution is estimated to be 0.673,⁶ almost twice the average level of OECD countries. If the population of the country were to be situated within the world's *per capita* income distribution, the 5 per cent richest South Africans would belong to the richest tenth, while the poorest 5 per cent would be among the poorest tenth of the global distribution (Milanovic, 2005a). Only 7.4 per cent of the world's population is poorer than the 5 per cent poorest South Africans (Milanovic, 2005a). It is tempting to attribute such a condition to the fact that from 1948 to 1994, South Africans were subject to the Apartheid regime, which enforced the rules and privileges of the white minority of European descent.

Although the end of the Apartheid regime is a turning point in South African history, it is difficult to study the differences in income inequality before and after Apartheid due to the almost complete lack of comparable data sources. One of the few surveys that allow the calculation of inequality measures prior to the end of Apartheid is the 1993 Living Standards Measurement Survey. Based on its data, the Gini index of South Africa's *per capita* income distribution was estimated to be 0.623 in 1993. Two years later, in 1995 (just one year after the end of Apartheid) another survey allows us to estimate that the Gini index was 0.648. This represents a 3.2 per cent increase in the Gini over two years. Five years later, in 2000, the Gini was estimated to be 0.673, representing an overall increase of 8.1 per cent from 1993 to 2000.⁷ Despite the likelihood of problems (since the data sources are not completely comparable and there are unavoidable measurement errors and biases), these statistics confirm, at least, that income inequality in South Africa is undeniably high.

The increase in income inequality from 1995 to 2000 is regarded as having had a direct impact on raising poverty levels and worsening the well-being of the poorest. We applied Datt and Ravallion's (1992) decomposition⁸ of changes in poverty into growth and redistribution components to the 1995 and 2000 rounds of the Income and Expenditure Surveys (IES). Our purpose was to estimate the effect of the rise in inequality. The results, presented in Table 1, show that the growth component explains 52 per cent of the rise in the headcount ratio while the redistribution component explains 46 per cent. Thus, the impact of inequality is strikingly high in comparison to its impact in other countries. Moreover, the redistribution component can be shown to have an even greater impact if the poverty measures being used are the more 'bottom-sensitive' indices, such as the poverty gap and the severity of poverty. Redistribution would explain 52 per cent of the rise in the poverty gap and 57 per cent of the rise in the severity of poverty.

TABLE 1

Poverty measures and decomposition. South Africa, 1995 and 2000

Year	Headcount	Poverty Gap	Severity of Poverty
1995	29%	11%	5%
2000	40%	18%	11%
<i>2000-1995 change</i>	11%	7%	5%
Decomposition 1995-2000			
Growth effect	52%	45%	39%
Redistribution effect	46%	52%	57%
Residual	2%	3%	5%
<i>Total</i>	100%	100%	100%

Note: The poverty line is set at 174 Rands of *per capita* household income in 2000 values and deflated to 1995 using South Africa's Consumer Price Index.

Source: Statistics South Africa, Income and Expenditure Survey, 1995 and 2000. Authors' calculations.

In addition to the high level of income inequality in South Africa, there are large disparities in the non-economic dimensions of human development. This condition is highlighted by the Human Development Index of South Africa, which was 0.658⁹ in 2003, ranking it 120th among the 177 countries for which the HDI was estimated. In addition to this generalized and multi-dimensional inequality, one should highlight the large component of *between-group* inequality by race. This has contributed to the low level of human development among Africans.

The *World Development Report 2006* highlights the impact of such inequalities by comparing the life chances of two hypothetical newborns in South Africa, one African and poor and the other White and rich: "*the opportunities that these two children face to reach their full human potential are vastly different from the outset, through no fault of their own*" (World Bank, 2006). Similarly, Day and Hedberg (2004) point out that the African¹⁰ newborn has a 7.2 per cent probability of dying in the first year of life, a percentage twice as high as the White newborn's. So, as one would expect, the life expectancies at birth of the two newborns vary between 50 years for the African and 68 years for the White.

These intense ethnic-racial disparities are also revealed in educational attainments. Table 2 documents the differences in schooling years among the younger cohorts of South Africans. Almost half of African youth have fewer than eight completed years of schooling; in sharp contrast, more than four-fifths of Whites have completed eight or more schooling years. It is reasonable to expect that the educational disadvantages of Africans will cause future disadvantages in earnings. Later we will present data to show how much of the earnings inequality in South Africa can be attributed to racial ascription and to educational achievement. Nevertheless, it is clear that such severe racial inequalities make it difficult for South Africa to overcome the cycle of high inequality and poverty with which it has been struggling since the end of Apartheid.

TABLE 2

Distribution of the population aged 15-25 by schooling years. South Africa, March 2004

Schooling	African	White
1 to 4 years	11.5	0.6
5 to 7 years	36.2	17.9
8 or more years	52.3	81.5

Source: Statistics South Africa, Labour Force Survey, March 2004. Authors' calculations.

Although poverty and inequality increased during the 1995-2000 period, South Africa has made remarkable progress since 1994 in other dimensions of human well-being. Many of the social indicators of the country have fared better than those related to income, particularly with regard to access to public services. This has been due mainly to reallocation of budgetary resources to promote education, health, social security and housing in poorer areas, where most of the African households dwell. The number of households with access to piped water, sanitation and electricity has increased substantially. However, such gains in well-being have not succeeded in mitigating the sharp differentials in income in the country.

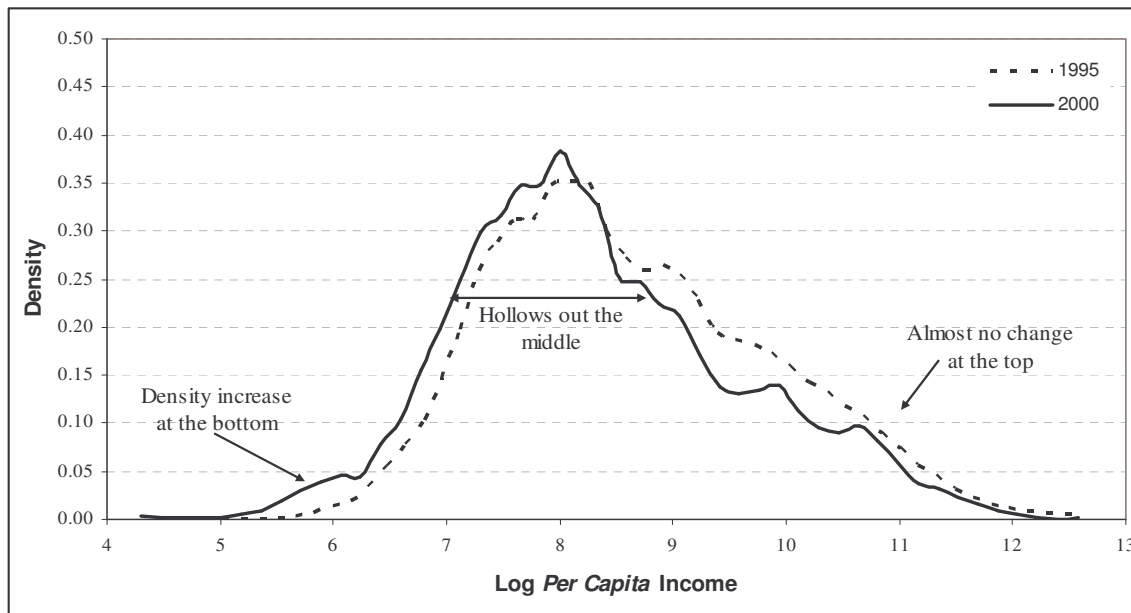
B. MAJOR DETERMINANTS OF THE INCREASE IN INCOME INEQUALITY

Most of the studies on economic inequality in South Africa have used the data on household income and expenditure provided by the 1995 and 2000 rounds of the Income and Expenditure Survey (IES). Some complementary sources of information have been deployed to overcome the limitations of the IES. By reviewing this literature (e.g., Lam and Leibbrandt, 2004; Leibbrandt, Levinsohn and McCrary, 2005; Bhorat and Kanbur, 2005; Hoogeveen and Özler, 2006; Leibbrandt *et al.*, 2006; Posel and Casale, 2006; and Rospabé and Selod, 2006), one can highlight some of the major causes of the increase in inequality and poverty on which there is general agreement:

- Decreases in income (mostly earnings) towards the bottom of the distribution;
- Labour market changes reflecting a trend of skill-biased labour demand;
- Rise of unemployment;
- Increase in rural-to-urban migration; and
- Adverse effects of macroeconomic policies.

The decrease of income towards the bottom of the distribution—as well as elsewhere—is depicted in Figure 1. The shift in the density function helps to reveal why there was the rise in inequality.

FIGURE 1

Density functions of the log of per capita income. South Africa, 1995 and 2000

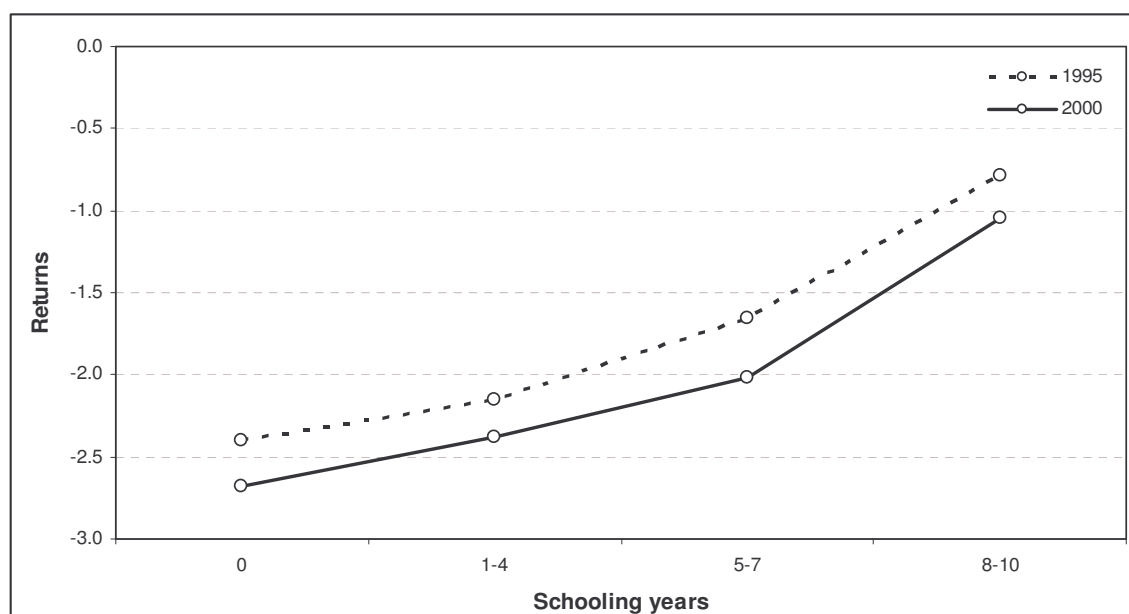
Source: Statistics South Africa, Income and Expenditure Survey, 1995 and 2000. Authors' calculations.

Although South Africa is not a 'transition' economy, such as the economies in Eastern Europe and the CIS, available evidence from transition regimes suggest that labour market changes have intensified between-group inequalities and prompted a shift in the density function of per capita income similar to that shown in Figure 1 for South Africa. Milanovic (1998) has pointed out that in Eastern Europe some middle-income workers became unemployed after they were replaced by new entrants into the workforce willing to accept lower earnings, while another smaller group of middle-income workers moved into better-paying jobs. This double movement of workers increases polarization, since it increases the density of workers toward both the bottom and the top of the distribution but hollows out the middle.

Such a trend appears to apply to South Africa, as the relative hollowing out of the middle in Figure 1 shows. At the same time, the Figure illustrates that there was a general shift to the left of the density function, except at the very bottom of the distribution and at the top. The number of households with below-average income increased while the number of households with above-average income decreased.

The studies that have identified the contraction of income among poorer households as a major explanation of the increase in inequality from 1995 to 2000 have attributed it to the decrease of the returns to endowments. Our own calculations endorse this conclusion. Figure 2 shows that the returns of schooling for workers aged 25-35 years became more convex for those with fewer than 11 years of schooling (which is the omitted base category). Returns dropped between 1995 and 2000 by 12 per cent for workers with no formal education (0 years), by 11 per cent for workers with 1-4 years of schooling, by 22 per cent for workers with 5-7 years and by 34 per cent for those with 8-10 years. Such a convex trend in returns can lead to a rise in inequality between workers with low and medium levels of education, on the one hand, and workers with higher education, on the other.¹¹

FIGURE 2

Returns to schooling, workers aged 25-35 years. South Africa, 1995 and 2000

Note: The base category, 11 or above years of schooling, was omitted.

Source: Statistics South Africa, Income and Expenditure Survey, 1995 and 2000. Authors' calculations.

Several factors could explain such changes in the returns to endowments. Some point to the rise of skill biases in the labour market. One possible factor is that slow economic growth led to slack demand for both formal and informal workers, but particularly for those with fewer years of schooling. Another factor is that the migration of rural workers to urban (or more developed rural) areas might have increased the supply of labour to the formal sector and have thereby decreased average wages.

Factors related to the rise of skill bias have likely been intertwined with other changes in labour supply and demand associated with the end of the Apartheid regime. The rural to urban migration, for instance, reflected the increased hope and freedom of movement among those who were previously excluded. Studies have shown that there was a dramatic movement of people who were previously categorized as economically inactive into the labour force. This movement has been simultaneously spatial and economic. The participation rates of African women and former agricultural workers have increased significantly and, as a result, so have their unemployment rates. Increases in the demand for labour have not matched the influx of such large numbers of workers into the formal labour force. Casale, Muller and Posel (2005) highlight that during 1995-2003, the South African economy generated only about 1.4 million jobs—a number far below that needed to match the growing labour supply.

South Africa has likely experienced an increased skill-bias in the labour market, which has primarily benefited young skilled workers. According to Seekings and Natrass (2005), since low-skilled workers—such as African women and former agricultural workers—have not been able to effectively compete for the available jobs in the post-Apartheid labour market, they have ended up unemployed. The increase in the excess supply of low-skilled workers has fortified the bargaining power of employers, who have succeeded in driving down the earnings of these workers. Based on observing these trends, Seekings and Natrass (2005)

identify two major groups in the South African labour force: 1) the *insiders*, predominantly White workers who have access to well-paid, skilled jobs; and 2) the *outsiders*, predominantly African workers who lack skills and education, and are left to compete for low-paid jobs or become unemployed.

Part of this polar segmentation in the labour market, which manifests itself as skill-bias, is also likely to be associated with changes in the macroeconomic environment. Since the end of Apartheid (which had made South Africa a pariah nation subject to embargoes), the government has pursued trade liberalization and greater openness to foreign investment as major components of its economic strategy. Milanovic (2005b) finds strong cross-country evidence of an adverse impact of trade liberalization on certain groups of workers. Such an impact might well apply in South Africa. Milanovic finds that at the beginning of trade liberalization in developing countries, high-income households have been the main beneficiaries, not low-income or middle-income households. This has led to a rise in inequality as a short-term consequence of greater openness. In South Africa, *insiders* (Seekings and Nattrass, 2005) at the upper end of the income distribution have enjoyed rising earnings as a result of the increased demand for their skilled labour associated with increasing trade liberalization during the 1995-2000 period. We take this as an operating assumption of our analysis without, however, focusing the paper on this topic.

Rama (2001) presents additional evidence of the relative increase in demand for high-skilled labour in South Africa that has been driven by trade liberalization. Because of the lack of demand for low-skilled employees, such workers have been pushed into the informal-sector or into self-employment. This trend is consistent with the finding by Casale, Muller and Posel (2005) that more than 60 per cent of employment growth during 1995-2000 was in the informal sector. Table 3 shows that during this period, there was a marked increase in self-employment, likely associated with the lack of demand for low-skilled workers and an associated increase in the trading sector.

TABLE 3

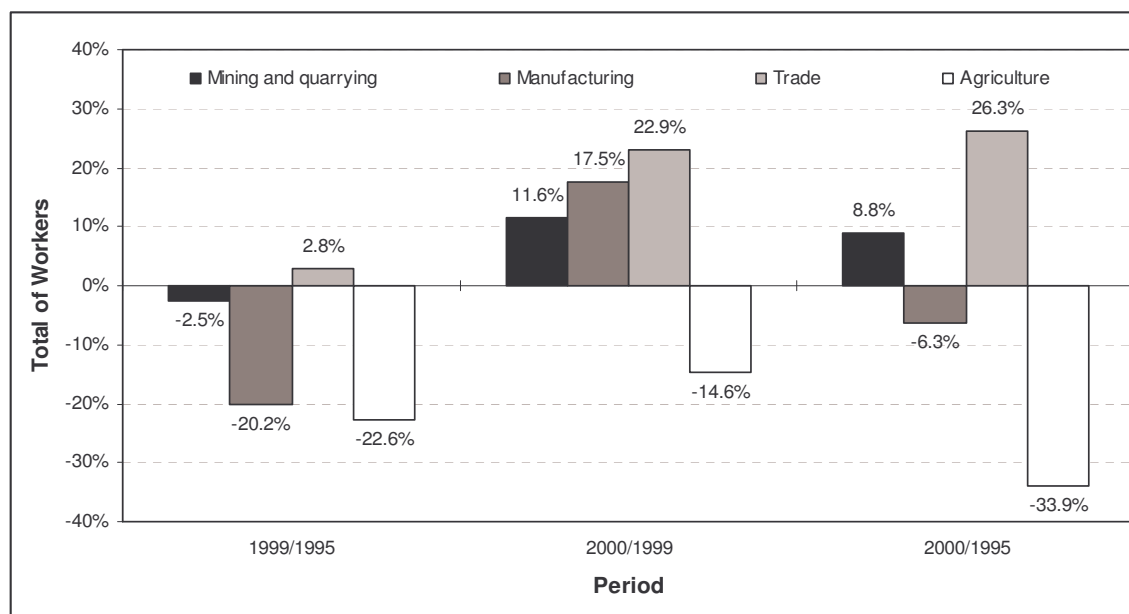
Distribution of workers aged 15-25 by activity category. South Africa, 1995 and 2000

Category	1995	2000	Δ
Agriculture	943,800	809,600	-14%
Domestic Worker	708,400	788,200	11%
Self-Employed	702,600	1 334,300	90%
Employees	7 137,300	7,272,300	2%
More than one activity	139,100	106,200	-24%
<i>Total</i>	<i>9,631,200</i>	<i>10,312,600</i>	<i>7%</i>

Source: Casale, Muller and Posel (2005).

Although Table 3 shows that there was a 7 per cent increase in labour demand between 1995 and 2000, it was not uniform across groupings of workers in South Africa. As a complement to this information, we computed sectoral employment trends for 1995-2000 for Employees and Self-Employed/Employers taken together. These are shown in Figure 3. Their employment opportunities contracted by 34 per cent in agriculture and six per cent in manufacturing. However, their employment rose by about nine per cent in mining and by 26 per cent in trade, the largest economic sector.

FIGURE 3

Employment trends by sectors. South Africa, 1995, 1999 and 2000

Source: Statistics South Africa, October Household Survey, 1995 and 1999; Labour Force Survey, September 2000. Authors' calculations.

The significant contraction of Agriculture and expansion of Trade correspond with the general trend of migration of low-skilled, inexperienced agricultural workers (many of them Africans) to urban areas in search of employment. Another important factor, corroborated in the literature, is the massive entrance of women workers into the labour force during this period. Their participation rates increased faster than men's. As a result, the rate of growth of female employment was also faster than for males. According to Borat (2004), 75 per cent of the 1.5 million new jobs created between 1995 and 2002 were secured by women. Consequently, the number of female workers increased by 33 per cent, while the number of male workers increased by only six per cent. As both Rama (2001) and Borat (2004) conclude, these trends correspond with an influx of low-skilled workers into the labour force and a general dampening of wages.

C. EARNINGS AND TOTAL INCOME INEQUALITY

A brief review of the literature on income inequality in South Africa suggests that the changes in the labour market that occurred in the post-Apartheid era were the major drivers of the dynamics of income distribution. This is not surprising: throughout the world, earnings are the major component of total income. South Africa is no exception to this rule. But we need to more precisely identify the contribution of earnings inequality to the inequality of total income during this period. Applying decomposition techniques can enable us to do so.

In order to apply such decompositions, we have divided household income, based on the structure of survey data, into five categories or components: i) wages and salaries of employees (earnings); ii) self-employed and employer income; iii) social insurance transfers; iv) other regular income; and v) other non-regular income. Unfortunately, data sources do not

allow us to split self-employed income from employer income. This is a distinct disadvantage because the self-employed are likely poorer than employers.

Social insurance transfers comprise all types of regular receipts from pensions, social welfare and other governmental grants. Other regular incomes comprise items such as royalties, interest, dividends, alimony, and allowances received from family members living elsewhere. Non-regular incomes include items such as net income from hobbies, income from sales, value of goods and services received while employed, gratuities, and other lump-sum payments received from public pensions, provident and other insurance funds, and from private pensions.

In our analysis, we have deployed the decomposition of changes in the Gini coefficient proposed by Milanovic (1998).¹² The results are shown in Table 4.

TABLE 4

Decomposition of total income inequality by income components. South Africa, 1995 and 2000

		Household per capita income					
		Total	Earnings: wages and salaries	Earnings: own business, self or employer	Social Insurance Transfers	Other regular Income	Other non-regular Income
1995	Factor's share of total income (S_i)	100%	62%	12%	8%	3%	14%
	Concentration Index (C_i)	0.648	0.612	0.716	0.605	0.644	0.765
	$C_i * S_i$	0.648	0.379	0.089	0.048	0.021	0.111
2000	Factor's share of total income (S_i)	100%	72%	5%	9%	5%	10%
	Concentration Index (C_i)	0.673	0.663	0.765	0.608	0.641	0.783
	$C_i * S_i$	0.673	0.480	0.035	0.052	0.031	0.075
Dec. 1995-2000	Changing shares (ΔS_i)	-1.5%	7.0%	-6.0%	0.4%	1.0%	-3.9%
	Changing Concentration (ΔC_i)	4.1%	3.7%	0.2%	0.0%	0.0%	0.2%
	Interaction ($\Delta S_i * \Delta C_i$)	0.1%	0.5%	-0.4%	0.0%	0.0%	-0.1%
	Δ Gini	2.7%	11.2%	-6.2%	0.5%	1.0%	-3.8%

Source: Statistics South Africa, Income and Expenditure Survey, 1995 and 2000. Authors' calculations.

Before decomposing the changes in total income, we present in Table 4 the concentration indices of each income component and its share in total income. Together, the two earnings categories represent 74 per cent of total income in 1995 and 79 per cent in 2000. These figures support the view that earnings are, by far, the most important component of total income and are likely to be the decisive factor in driving changes in the distribution of total income.

The decomposition of changes in inequality yields three terms: one for the changes in the weight of the income component in total income; another for the changes in the concentration (i.e., relative distribution) of the income component; and a third for the interaction between the two. Table 4 shows that the Gini coefficient of total income rose 2.7 per cent from 1995 to 2000 as a result of these factors.

The first earnings component (wages and salaries of employees) increased its share of total income from 62 per cent to 72 per cent. It also became more unequal: its concentration ratio rose from 0.612 to 0.663. Overall, the increasing share of wages and salaries in total income accounted for a seven per cent increase in total inequality while the greater relative inequality of its own distribution accounted for a 3.7 per cent increase. Taking into account the interaction term (which accounted for a 0.5 per cent increase), the total impact of wages and salaries accounted for a 11.2 per cent increase in the inequality of total income.

In contrast, the share of self-employed and employer earnings in total income dropped between 1995 and 2000—from 12 per cent to only five per cent. This had an equalizing effect on income distribution since this component is significantly more unequally distributed than total income. The effect of this component was one of the major reasons that the shift in the shares of all income components reduced inequality by 1.5 per cent. However, the distribution of this earnings component became more unequal, marginally increasing total inequality. As a result, the overall impact of this component reduced the inequality of total income by 6.2 per cent.

Of the other three smaller components, other non-regular income had the biggest impact on total income inequality: this component decreased inequality by 3.8 per cent. But this effect was mainly due to a drop in its share of total income from 14 per cent to 10 per cent. Not only was it very unequally distributed in 1995, but its distribution also became more unequal in 2000. The other two small components marginally increased inequality because of modestly rising shares in total income.

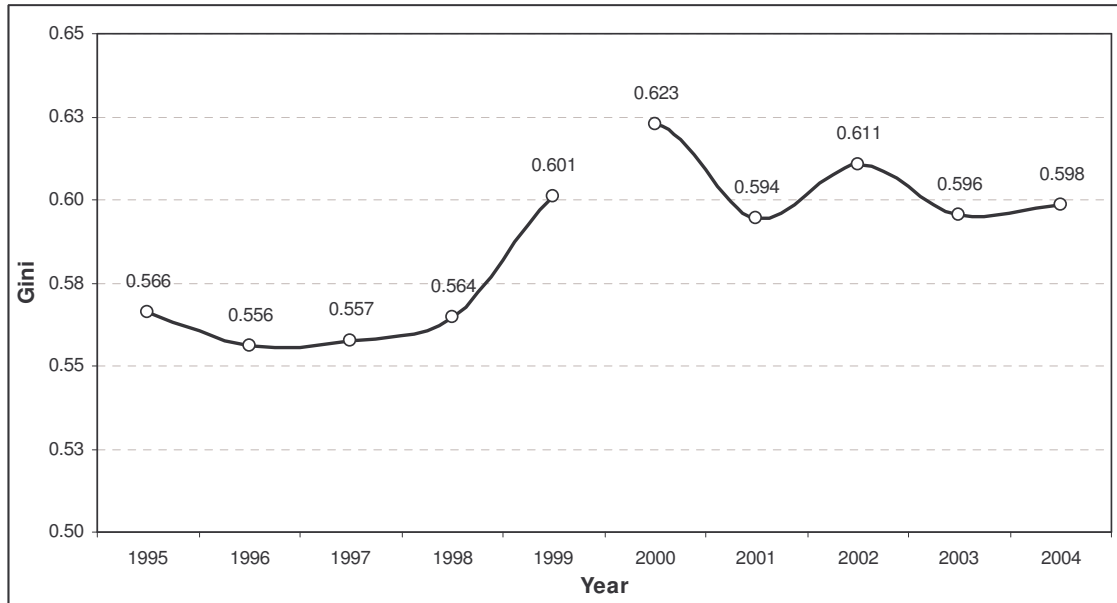
4 EARNINGS INEQUALITY IN SOUTH AFRICA, 1995-2004

A. THE EVOLUTION OF EARNINGS INEQUALITY

Having established the importance of the earnings component for understanding the dynamics of income inequality, we now proceed to examine it systematically.

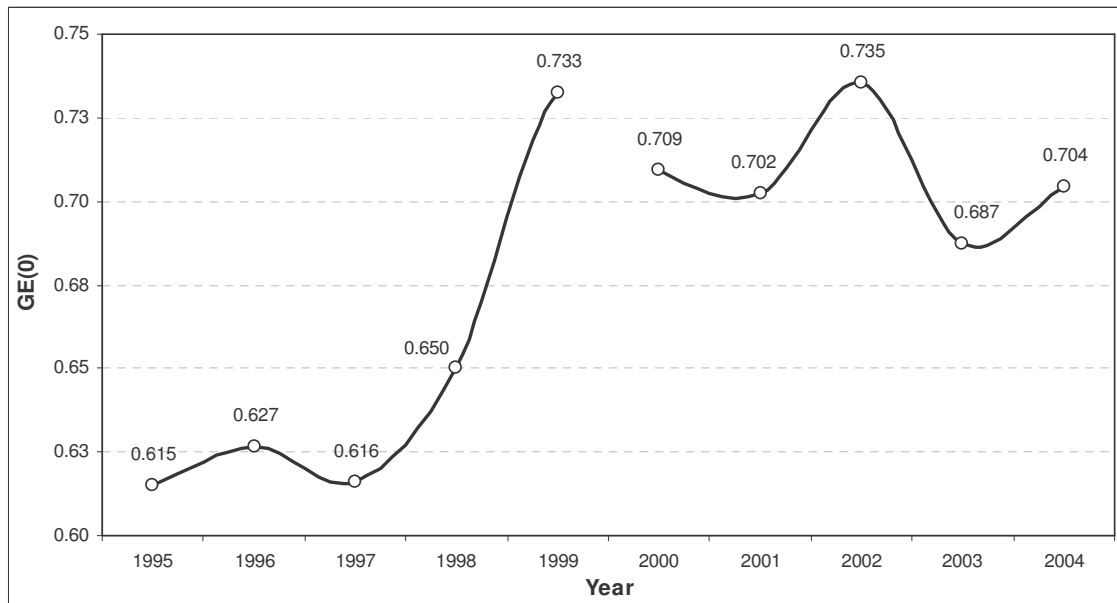
Figures 4 and 5 chart the evolution for the whole period 1995-2004 of earnings inequality, based on two inequality measures—the Gini coefficient and the Generalized Entropy measure with α set to zero, $GE(0)$, also known as the Theil-L index.¹³ The Gini coefficient of the earnings distribution was estimated to be 0.566 in 1995, 0.623 in 2000 and 0.598 in 2004 (Figure 4). These statistics are different from the concentration coefficients for 1995 and 2000 presented previously in Table 4 because now the earnings component (wages and salaries plus the labour income of the self-employed and employers) is not sorted by total household *per capita* income, but by itself. There was an increase of 10 per cent in earnings inequality in the first period and a decrease of 4 per cent between 2000 and 2004. This results in a net increase of 6 per cent for the whole period 1995-2004. The trend for the whole period should be taken *cum grano salis* because the data sources for the first period are not the same as those for the second (note the break in the series between 1999 and 2000).

FIGURE 4
Evolution of earnings inequality, Gini index. South Africa, 1995-2004



Source: Statistics South Africa, October Household Survey, 1995-1999; Labour Force Survey, September 2000-2003, March 2004. Authors' calculations.

FIGURE 5
Evolution of earnings inequality, GE(0). South Africa, 1995-2004



Source: Statistics South Africa, October Household Survey, 1995-1999; Labour Force Survey, September 2000-2003, March 2004. Authors' calculations.

Based on estimates of the GE(0), which puts more weight than the Gini index on the bottom of the distribution, South Africa experienced inequality peaks in 1999 and 2002. Also, the GE(0) exhibited more volatility than the Gini coefficient. For the 1995-2004 period, the

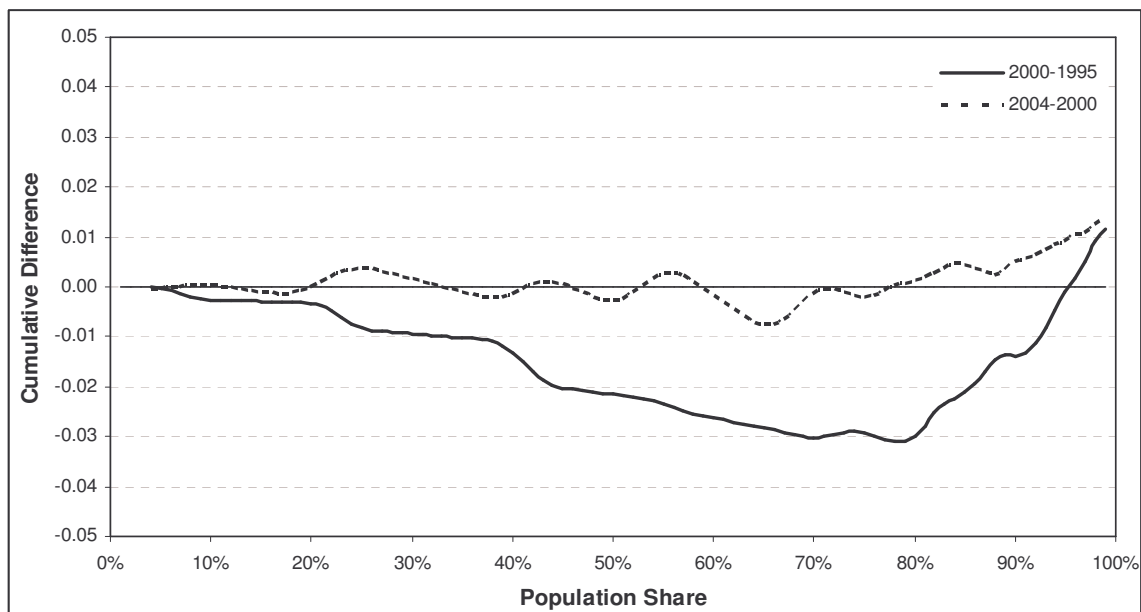
GE(0) increased by 14 per cent. And despite wide fluctuations after 1999, it remained significantly higher than before. The trend for GE(0), which helps highlight changes in inequality at the bottom of the distribution, confirms our working assumption that the earnings of low-skilled workers have been more adversely affected by slow growth and rising unemployment than high-skilled workers.

Figure 6 presents differences in the Lorenz Curves of earnings by population percentile for two periods, 1995-2000 and 2000-2004. The bold line presents the change in the Lorenz curve of earnings by percentile between 1995 and 2000 and the dotted line presents the corresponding changes between 2000 and 2004. The main differences between the two curves are found between the 20th and 80th percentiles. During the period 1995-2000, the main decreases in earnings occurred in the middle of the distribution. The bottom 20 per cent of earners did not lose much in income while the very top of the distribution gained. Earnings declined progressively from the bottom 20 per cent of earners to the 80th percentile; thereafter (i.e., for the top 20 per cent), losses in income were reduced. This illustrates why earnings inequality increased during this period. The top of the distribution comprises mainly high-skilled workers, who have greater opportunities to garner high earnings during periods of economic opening.

Compared to 1995-2000, there is a distinctively different trend in earnings inequality for the period 2000-2004 (see the dotted line in Figure 6). There is much less change in inequality. The top 20 per cent did gain in income while the bottom 20 per cent received about the same income over time. The pattern for the middle 60 per cent of earners was mixed, with small gains at some points in the distribution offset by small losses at other points.

FIGURE 6

Differences between the Lorenz Curves of Earnings. South Africa, 1995, 2000 and 2004



Source: Statistics South Africa, October Household Survey, 1995; Labour Force Survey, September 2000, March 2004. Authors' calculations.

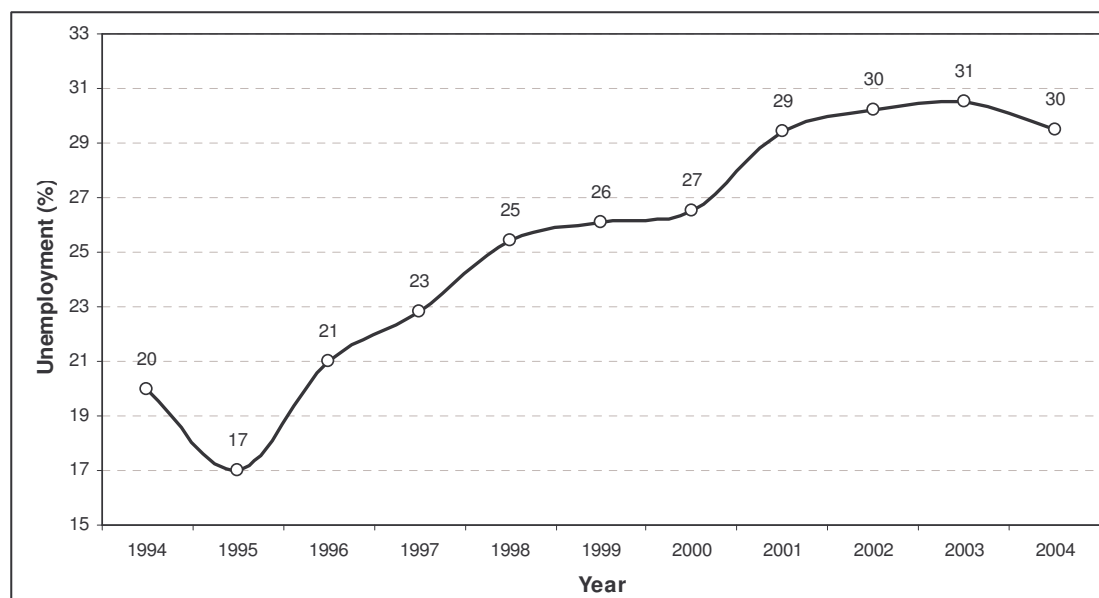
B. UNEMPLOYMENT AND EARNINGS INEQUALITY

The most plausible assumption on the relationship between unemployment and earnings in South Africa is that there is a negative relationship (a 'wage curve'). As unemployment goes up, average earnings generally decline (Kingdom and Knight, 1999). In other words, there would be a negative elasticity of earnings with respect to unemployment.¹⁴ Such a result would be similar to what has been found in OECD countries.

After 1995, unemployment was sharply on the rise in South Africa. Some analysts have pointed out that the economy has been unable to create enough jobs, at least not of the calibre that would be required to incorporate the growing supply of labour. The end of Apartheid gave people the opportunity to move from rural to urban areas. As a result, spatial mobility increased throughout the country. Comparing 1995 and 2000 data suggests that 4.5 million workers entered the labour force. The majority of them, around 3.5 million workers, were youth who had just reached working age. The remaining one million workers were already of working age in 1995 but were classified then as inactive. These dynamics pushed up unemployment figures from 1.9 million to 4.2 million between 1995 and 2000, accounting for an increase of 10 percentage points in the unemployment rate. Figure 7 shows that during the whole period 1995-2004, the official unemployment rate rose 12.5 percentage points. It is noteworthy, however, that after 2001, unemployment began to level off and in 2004 it decreased for the first time. However, the 2004 level of unemployment is still very high by any standard.

FIGURE 7

Unemployment. South Africa, 1995-2004



Source: Statistics South Africa, October Household Survey, 1995-1999; Labour Force Survey, September 2000-2003, March 2004. Authors' calculations.

When the unemployment rate is as high as it is in South Africa, its negative impact on wages could easily exacerbate poverty. This could be due partly to imperfections in the functioning of the labour market. In this case, a rise in unemployment might have a differential impact across the entire distribution. Bearing this in mind, we have more closely investigated how changes in the structure of employment have impacted earnings inequality in South Africa.

Table 5 presents some disaggregated statistics for employment and relative average earnings by categories of workers. While the share of workers in urban and rural areas has remained stable, the income gap in favour of urban workers increased between 1995 and 2004. With regard to age groups, workers aged 35-44 increased their relative mean earnings while older workers, aged 45-55 years, experienced a relative decline in earnings.

There is a complex and interesting evolution of earnings when workers are classified by years of schooling. While the share of highly educated workers (i.e., having eight years or more of schooling) declined slightly during 1995-2000, it rose dramatically, by five percentage points, between 2000 and 2004. However, while their relative average earnings increased significantly between 1995 and 2000, they declined correspondingly between 2000 and 2004. In contrast, the relative average earnings of workers with 5-7 years of schooling progressively declined during the whole period 1995-2004 and the same trend characterized workers with no education.

The share of male workers declined between 1995 and 2004 as did their relative average earnings. Correspondingly, both the share and the average earnings of female workers rose. Their average earnings shot up by 12 per cent from 2000 to 2004.

While the share of White workers declined progressively throughout the 1995-2004 period, their average earnings rose overall from 2.30 (relative to the mean) to 2.69. The earnings of Coloured workers also rose substantially, i.e., from 0.64 to 0.93 (close to the average). In 1995, the average earnings of African workers were only 60 per cent of the average and rose marginally to 65 per cent by 2004. This trend in earnings occurred at the same time that Africans' share of total workers jumped from 64 per cent to 72 per cent. Thus, Africans were making gains in securing employment but not at notably higher earnings. Part of the reason is that compared to White and Coloured workers, African workers did not possess enough skills and education to advance rapidly.

The evidence on occupational categories of workers for the period 2000-2004 suggests that there was both a regression toward the mean of higher-paid workers (such as professionals and technicians) and a regression away from the mean of lower-paid workers (such as craft workers and machine operators) (review the changes in the density function in Figure 1).

TABLE 5

Share of all workers and relative average earnings by categories of workers aged 25-54 years. South Africa, 1995, 2000 and 2004

Breakdown	Category	1995		2000		2004	
		%	relative μ	%	relative μ	%	relative μ
Area	Urban	68%	1.19	68%	1.25	69%	1.23
	Rural	32%	0.59	32%	0.45	31%	0.48
Age	25-34	41%	0.85	40%	0.89	38%	0.91
	35-44	37%	1.06	38%	1.09	38%	1.08
	45-55	23%	1.19	23%	1.05	24%	1.02
Education (Schooling years)	None	8%	0.32	7%	0.28	6%	0.27
	1-4	16%	0.33	18%	0.35	16%	0.34
	5-7	22%	0.51	22%	0.50	21%	0.43
	8 or +	55%	1.48	53%	1.54	58%	1.46

→

Breakdown	Category	1995		2000		2004	
		%	relative μ	%	relative μ	%	relative μ
Gender	Male	62%	1.19	54%	1.23	56%	1.14
	Female	38%	0.70	46%	0.73	44%	0.82
Race	African	64%	0.60	69%	0.59	72%	0.65
	Coloured	11%	0.64	11%	0.93	11%	0.93
	Other	3%	1.55	4%	1.46	3%	1.75
	Whites	21%	2.30	16%	2.74	14%	2.69
Occupation	1 Legislators, senior officials and managers			5%	3.23	6%	3.08
	2 Professionals			5%	3.13	4%	3.04
	3 Technical and associate professionals			10%	1.81	10%	1.74
	4 Clerks			9%	1.23	10%	1.25
	5 Service workers and shop and market sales workers			12%	0.78	12%	0.75
	6 Skilled agricultural and fishery workers			8%	0.21	2%	0.45
	7 Craft and related trades workers			14%	0.85	13%	0.79
	8 Plant and machine operators and assemblers			11%	0.74	11%	0.67
	9 Elementary Occupation			19%	0.43	22%	0.35
	10 Domestic workers			9%	0.20	9%	0.19
Sector	1 Agriculture, hunting and forestry			12%	0.26	10%	0.33
	2 Mining			5%	1.25	6%	1.02
	3 Manufacturing			14%	1.09	14%	1.06
	4 Electricity, gas and water			1%	1.69	1%	1.80
	5 Construction			5%	0.75	5%	0.64
	6 Wholesale and retail trade			21%	0.78	20%	0.77
	7 Transport, storage and communication			5%	1.39	5%	1.47
	8 Finance and business services			8%	2.13	9%	1.83
	9 Community, social and personal services			18%	1.49	20%	1.52
	10 Private households			11%	0.20	11%	0.19
	11 Exterior organizations and foreign government			0%	1.75	0%	1.25

Source: Statistics South Africa, October Household Survey, 1995; Labour Force Survey, September 2000, March 2004. Authors' calculations.

C. DECOMPOSING EARNINGS INEQUALITY

We now turn our focus to the yearly static decomposition of the GE(0) measure of inequality for the 1995-2004 period (whose general trend has already been presented in Figure 5). Table 6 presents *between-group* inequality as a percentage of total inequality. The categories are the same as those listed in the Data and Methods section; the regional groups are the nine South African Provinces. The column labelled as 'Employee / Self or Employer / Both' presents the inequality between three groups: those who work only as an employee, those who work as a self-employed worker or an employer, and those who work both as an employee and a self-employed worker or an employer.

Despite some fluctuations in the percentages over time, some of the general trends are fairly clear. *Between-group* inequality across both urban/rural areas and provinces increased between 1995 and 2004. Inequalities by gender and age, in contrast, generally declined. Inequalities by education and race remained important but dropped over time.

Between-group inequality by educational categories as a percentage of total earnings inequality dropped from about 30 per cent in 1995 to about 27 per cent in 2004, after falling significantly through 1999. While *between-group* inequality by racial categories was at a peak in 1995 (i.e., about 30 per cent), it generally declined to a point where it averaged about 23 per cent during 2002-2004.

Between-group inequality by both employment category and economic sector generally declined between 1995 and 2004. In contrast to the two preceding categories, inequality by occupation remained very important. While it was about 39 per cent in 1995, it declined significantly through 1999. But it increased substantially thereafter so that it ranged between 39 per cent and 41 per cent during 2002-2004.

TABLE 6

Between-group inequality as percentage of total earnings inequality. Static decomposition. South Africa, 1995-2004

Year	Area	Region	Gender	Age	Education	Race	Employee / Self or Employer / Both	Occupation	Sector
1995	7.7%	4.9%	4.8%	3.9%	30.4%	29.1%	4.8%	39.4%	5.2%
1996	6.7%	4.6%	2.9%	3.5%	24.5%	24.0%	6.1%	27.9%	1.0%
1997	8.6%	4.8%	3.1%	2.7%	23.1%	26.8%	8.6%	21.1%	16.1%
1998	7.0%	3.8%	3.3%	4.4%	22.7%	24.5%	8.6%	32.6%	2.6%
1999	7.4%	4.7%	2.9%	2.5%	14.9%	21.4%	1.8%	29.7%	3.0%
2000	9.8%	3.5%	3.5%	2.7%	26.5%	26.1%	0.1%	34.0%	1.7%
2001	10.0%	4.2%	2.9%	2.9%	27.6%	26.2%	0.2%	36.6%	1.4%
2002	11.2%	4.9%	2.0%	2.2%	29.1%	23.1%	0.1%	39.0%	2.3%
2003	9.8%	5.0%	2.3%	2.5%	28.8%	22.7%	0.0%	41.0%	1.6%
2004	11.3%	6.4%	1.8%	2.6%	27.3%	23.1%	0.4%	41.2%	2.7%

Source: Statistics South Africa, October Household Survey, 1995-1999; Labour Force Survey, September 2000-2003, March 2004. Authors' calculations.

Table 7 presents another approach to understanding earnings inequality, namely, dynamic decompositions of GE(0). It shows that between 1995 and 2000, the pure *with in-group* inequality effect (the unexplained term *a*) is greater than 15.3 per cent (the total

percentage change in GE(0)) for the decompositions related to Region (Province), Age, Education and Gender. This implies that income and demographic effects have been relatively less important for these categories in explaining inequality. In general, *within-group* inequalities were driving the overall increase in earnings inequality during this period.

For Area (urban/rural) and Race categories, the income effect (*d*) is significant and inequality-increasing for 1995-2000. Such an effect increases total inequality by 4.2 per cent with regard to Area and 4.7 per cent with regard to Race. However, for Race, the combined allocation effects (*b* and *c*) offset, to some degree, the inequality-increasing impact of income differentials. A widening of mean incomes across Occupation categories is also a factor during 1995-2004 in increasing total earnings inequality (i.e., 1.6 per cent) but less so than for Area and Race.

During 2000-2004, total earnings inequality drops marginally, namely, by 0.7 per cent. The overall marginal decrease in inequality is prompted mostly by a drop in *within-group* inequality among groupings of workers categorized by Area, Region, Education and Occupation. However, the widening of mean earnings across groupings of workers categorized by Region, Education and Occupation offsets much of the decline due to shrinking *within-group* inequality. This is linked to increasing convexity in returns to endowments across sub-groups. The largest impact on increasing inequality (3.1 per cent) is contributed by Occupation—an inequality-increasing trend that had been initiated during 1995-2004. For Gender and Race, rising *within-group* inequality serves to increase overall inequality but this effect is nullified by a narrowing of mean incomes across groupings of workers.

TABLE 7

Changes in earnings inequality. Dynamic decomposition. South Africa, 1995-2004

	Term*	Area	Region	Age	Education	Gender	Race	Occupation	Sector
1995-2000 15.3% change in GE(0)	a	12.2%	15.7%	15.5%	15.6%	16.2%	12.9%	14.9%	
	b	-0.6%	0.3%	0.5%	-0.3%	-0.2%	1.1%	0.6%	
	c	-0.6%	-0.2%	-0.4%	0.1%	0.3%	-4.4%	-1.9%	
	d	4.2%	-0.6%	-0.4%	-0.1%	-1.1%	4.7%	1.6%	
2000-2004 -0.7% change in GE(0)	a	-2.1%	-2.8%	-0.7%	-2.0%	1.1%	1.5%	-3.8%	-1.3%
	b	0.1%	-0.7%	0.2%	0.6%	-0.1%	1.2%	-2.5%	-0.3%
	c	0.4%	0.0%	-0.1%	-1.4%	0.0%	-1.6%	2.6%	0.0%
	d	1.0%	2.8%	0.0%	2.2%	-1.7%	-1.2%	3.1%	0.8%
1995-2004 14.5% change in GE(0)	a	9.5%	12.5%	14.6%	13.4%	17.1%	14.9%	6.8%	
	b	-0.2%	-0.5%	0.9%	0.3%	0.2%	2.3%	0.0%	
	c	-0.3%	-0.1%	-0.5%	-1.5%	0.2%	-6.1%	1.5%	
	d	5.5%	2.6%	-0.5%	2.4%	-2.9%	3.1%	6.2%	

Note: Term *a* is the pure inequality effect; terms *b* and *c* are the allocation effect; term *d* is the income effect. See Appendix for details.

Source: Statistics South Africa, October Household Survey, 1995; Labour Force Survey, September 2000, March 2004. Authors' calculations.

The rise of 14.5 per cent in total earnings inequality during the whole period of 1995-2004 follows patterns similar to those for the period 1995-2000. Widening differentials among sub-group means (*d*) are important for Urban/Rural, Regional, Educational, Racial and Occupational

categories. The largest contributions to increasing earnings inequality are caused by widening differentials by Area and Occupation. For the most part, changes in the composition of sub-groups (allocation effects) have modest impacts, except for Race (where $b+c$ equals -3.8 per cent, which represents a significant inequality-reducing impact). But the high level of the *within-group* inequality component (a) is the main driver of the rise in inequality across most population sub-groups. The two exceptions, however, are Area and Occupation.

In summary, the substantial increase in total earnings inequality during the period 1995-2000 can be linked mostly to increasing *within-group* inequality across almost all categories and, secondarily, to a marked widening of mean earnings across Urban/Rural and Racial groupings. For the period 2000-2004, the stabilization of earnings inequality is associated with declining *within-group* inequality, mostly by Area, Region, Education and Occupation. There is some narrowing of *between-group* differentials by Gender and Race. But there is a more substantial widening of such differentials by Region, Education and Occupation, which serves to offset much of the reduction in *within-group* inequality.

For the whole period of 1995-2004, the substantial rise in earnings inequality (due mostly to changes during 1995-2000) is attributable mainly to rising *within-group* inequality across almost all groupings of workers. However, there is also rising *between-group* inequality, overall, across groupings by Area, Region, Education, Race and Occupation. The most significant widening of sub-group means characterizes groupings by Area and Occupation. Workers in rural areas have experienced a clear relative decline in earnings compared to workers in urban areas. And workers in occupations offering below-average earnings have lost ground relative to workers in occupations offering above-average earnings. This is a barometer of the increasing skill bias in the South African labour market.

D. MACROECONOMIC TRENDS AND EARNINGS INEQUALITY

In this section, we present some evidence on correlations between the micro-level trends in inequality that we have presented above and macroeconomic trends in South Africa since 1995. While our results are suggestive of causal relationships, they cannot be considered definitive. Drawing any firm policy lessons would have to be based on more in-depth and systematic analysis.

According to the prevailing literature, some of the main features of South Africa's economic strategy have focused on maintaining macroeconomic stability and promoting exports in order to stimulate growth; making labour markets more flexible; improving productivity; increasing training and employment for unskilled and low-skilled workers; increasing the proportion of non-whites and females at all levels of employment; providing a right to annual leave; and imposing rules and procedures that prevent unfair dismissal.¹⁵ Researchers such as Leibbrandt, Van der Berg, and Borat (2001) and Hoogeveen and Özler (2006) claim that such policies have failed to generate growth rapid enough and employment-intensive enough to counteract rising unemployment (which has been correlated with the increase of labour force participation rates). However, most of these judgments are based on evaluating trends only up to 2000—probably a period that has been too brief to exhibit the full impact of the strategies and programmes that the ANC Government instituted.

Despite major efforts by the Government, the economy had slow growth between 1994 and 2004. The Rand depreciated until 2001 but afterwards appreciated. Such a trend should help contain inflation. Nevertheless, the overriding problem has remained the lack of growth, which has resulted in persistently high levels of unemployment.

Despite disappointing economic results, improvements in human development outcomes have been more encouraging. This has been due to more equitably distributed fiscal expenditures and the expansion of access to public services (see Borat and Kanbur (2005)). For example, social expenditures increased by five percentage points of GDP between 1993 and 2003, reaching 17 per cent. The allocation to rural areas increased by over 30 per cent, reducing the gap between rural and urban areas in access to education, water and health services. Van der Berg (2006) claims that social expenditures were strongly equity enhancing. The child support grant, together with other transfers such as old-age pensions and disability grants, have been not only effective as anti-poverty interventions but also as inequality-reducing programs.¹⁶

TABLE 8

Economic Statistics. South Africa, 1994-2004

Year	Economic growth	Inflation rate	Food Prices (Changes in Metrop)	Exchange rate (R/\$US), year end
1994	3.4%	9.8%	17.5%	R3.54
1995	3.3%	6.9%	3.7%	R3.65
1996	3.5%	9.3%	9.9%	R4.68
1997	1.7%	6.2%	6.5%	R4.87
1998	0.1%	9.0%	6.4%	R5.90
1999	4.0%	2.2%	5.1%	R6.15
2000	4.7%	7.0%	5.4%	R7.64
2001	2.1%	4.6%	11.4%	R11.68
2002	4.3%	12.4%	16.1%	R8.94
2003	2.4%	0.3%	2.6%	R6.53
2004	5.8%	3.4%	1.5%	5.8%

Sources: Reserve Federal Bank; Statistics South Africa.

By computing correlations of the Gini index of earnings with Inflation, Economic Growth, Average Wages and Unemployment for the period 1995-2004 (Table 9), we find that in South Africa, inflation is negatively correlated with inequality but not statistically significant.¹⁷ In contrast, the correlation of the Gini coefficient of earnings with the Unemployment rate is positive (0.708) and significant (0.02 p-value), suggesting that rising unemployment has had a marked impact on increasing inequality in the country. Moreover, contrary to expectations, Growth has also been associated with rising inequality (the correlation being significant at the 10 per cent probability level).¹⁸

Table 9 also reports the results of computing partial correlations, which include a combination of factors, but isolate the relationship between two variables by holding others constant. Holding unemployment constant, we find that rising inequality is associated with a fall in average wages (with significance at the 10 per cent probability level). This would imply not only that wages are increasing more slowly than other sources of income, but also that lower-income workers are experiencing sharper falls in wages than higher-income workers.

TABLE 9

Correlations and Partial Correlations for the period 1995-2004

Correlation	ρ	p-value
Gini, Average wages	0.062	0.865
Gini, Inflation	-0.191	0.597
Gini, Growth	0.588	0.074
Gini, Unemployment Rate	0.708	0.022
Partial Correlation		
Gini, Growth Inflation, Unemployment Rate	0.670	0.069
Gini, Inflation Average wages, Unemployment Rate	-0.039	0.927
Gini, Unemployment Rate Average wages, Inflation	0.809	0.015
Gini, Unemployment Rate Growth, Inflation	0.751	0.032
Gini, Average wages Unemployment Rate	-0.575	0.10
Gini, Growth Unemployment Rate	0.588	0.096
Gini, Unemployment Rate Average wages	0.816	0.007

Source: Statistics South Africa, October Household Survey, 1995; Labour Force Survey, March 2004. Authors' calculations.

Our data suggest that in the South African context, rising unemployment has been the main determinant of a rise in earnings inequality. Unemployment has disproportionately hurt the earnings of workers with lower skills and less education. The great majority of such workers are African and have migrated from rural areas in search of non-agricultural employment. However, the pace of growth in South Africa has been too slow to provide gainful employment to this new influx of workers. When the economy has offered employment, it has been at a relatively low level of earnings. The available evidence also suggests that economic growth in South Africa has been associated with rising inequality, but this correlation has been due, no doubt, to the economy's inability to generate remunerative employment, especially for low-skilled workers.

5 CONCLUSIONS

During the period 1995-2004, earnings inequality rose sharply initially and then fell marginally. While such inequality rose 14.5 per cent over the whole period, it increased by 15.3 per cent during 1995-2000 and then fell by 0.7 per cent during 2000-2004. This moderation of the previously sharp rise in earnings inequality is a hopeful sign. Whether such a trend will continue depends on the dynamics of the underlying factors driving inequality.

A strong conclusion from our analysis is that rising unemployment was the principal immediate factor exacerbating earnings inequality in the 1990s. Although increases in unemployment have been moderate since 2000, its level has remained high. The South African economy is not growing rapidly enough or equitably enough to provide decent work to all labour force participants. The underlying weaknesses of the economy have been highlighted by rising rates of labour participation, as Africans, rural residents and women have entered the labour market in increasing numbers in search of remunerative employment. Such an unprecedented influx of new entrants has put downward pressure on average real wages and increased inequality and poverty in the process.

While South Africa's reliance on an export-led growth strategy has benefited higher income workers who possess education and skills, it has left behind a large majority of workers, most of them Africans, who lack the education or skills to compete for decent jobs. Hence, such an economic strategy has contributed to widening earnings differentials across various groupings of the labour force, such as across workers from urban and rural areas, workers from different regions, workers with different levels of education, workers of different races, and workers in different occupations. Widening inequality is often associated with economies that are becoming more open to global trade and investment. Under such conditions, labour demand is often biased towards skilled labour. This appears to be the case in South Africa, especially during the 1990s.

A central question in South Africa is whether the moderation of inequality at the beginning of the 2000s will continue. Some of the data suggest that the earnings of higher-income workers are decreasing relative to mean earnings. However, lower-income workers are also losing in relative terms. Occupational status has emerged as an influential factor in driving earnings inequality, especially during the 2000s.

While trade and services have absorbed many of the agricultural workers who have migrated to cities to find better employment, most of these jobs have been in the informal sector. Moreover, these sectors appear to be reaching the saturation point. During the 2000s, employees in the formal sector have increased in importance. Employment in manufacturing has also increased. Hopefully, such trends will not only pull up average earnings, but also help reduce earnings inequality by drawing increasing numbers of semi-skilled and low-skilled workers into better employment.

Earnings inequality has risen or remains high among various categories of workers, particularly based on Race, Education, and Occupation, and, secondarily, by Region and Rural/Urban Area. But for some of these categories, such as Race and Education, *between-group* earnings inequality has declined. Differentials in mean earnings among Occupational categories now far surpass those for either Education or Race. And differentials in mean earnings across Provinces and between Rural and Urban areas have also intensified.

In the 2000s, sharpening differentials in mean earnings across Regions, Educational levels and Occupational levels continue to be disequalizing—much more so than in the 1990s, when Race and Rural-Urban divides were the major driving forces in intensifying inequality. In the 2000s, the influence of the Rural-Urban divide is moderating, Gender and Racial differentials are in modest decline while Occupational differentials are rising sharply. While *within-group* inequality was rising sharply in the 1990s, it has markedly declined during the 2000s. Demographic changes have not had a major impact on the dynamics of earnings inequality. The major exception applies to Race, where changing population shares have served to decrease inequality over the whole period 1995-2004.

Such significant emerging changes in the dynamics of earnings inequality in the 2000s, compared to the tumultuous post-Apartheid period of the 1990s, pose new challenges for South African policymakers in their continuing efforts to enhance equity and social justice in the country.

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APPENDIX

POVERTY DECOMPOSITION PRESENTED IN TABLE 1

Datt and Ravallion (1992) have proposed a decomposition technique for Foster, Greer and Thorbecke poverty indices¹⁹ that identifies a growth component (which is calculated by holding the Lorenz curve constant and allowing the mean to change), a redistribution component (which holds the mean constant and allows the Lorenz curve to change) and a residual term.²⁰

Mathematically, the decomposition is given by:

$$\Delta P = P_{t+n} - P_t = \left[P\left(\frac{z}{\mu_{t+n}}, L_t\right) - P\left(\frac{z}{\mu_t}, L_t\right) \right] + \left[P\left(\frac{z}{\mu_t}, L_{t+n}\right) - P\left(\frac{z}{\mu_t}, L_t\right) \right] + R_t$$

Where z denotes a poverty line that is constant in real terms, L_t denotes the Lorenz curve at time t , and μ_t denotes the distribution's mean at time t .

GINI INDEX BASED ON THE LORENZ CURVE

Given a series of n observations classified in p categories c_1, c_2, \dots, c_p where the total observations in each p category are n_1, n_2, \dots, n_p . Moreover, given that x_i is the average point in the category c_i (for example, when c_i comprises all workers with earnings between 0 and 100, x_i is set as 50).

Suppose now that $1 \leq p$, $x_1 > 0$, $x_i < x_{i+1}$ and n_i is positive $\forall i=1, \dots, p$. Consequently $n = n_1 + n_2 + \dots + n_p$. The total mass of the series is computed by $m = n_1 x_1 + \dots + n_p x_p$ and its average is defined as $moy = m/n$. Now, for each p from 1 to n , we must compute:

$$\alpha_p = (n_1 + n_2 + \dots + n_p) / n$$

$$\beta_p = (v_1 \xi_1 + v_2 \xi_2 + \dots + v_p \xi_p) / \mu$$

Where α_p is the percentage of people with value smaller or equal to category x_p and the observation group x_p has the fraction of the total mass equal to β_p . Moreover, $\alpha_p = \beta_p = 1$ and for simplicity $\alpha_0 = \beta_0 = 0$.

To generate the Lorenz curve, we must plot only α_p and β_p graphically. Based on this Lorenz curve, the Gini is derived as

$$Gini = 1 - \sum_{i=0}^{p-1} \frac{n_{i+1}}{n} \cdot (\beta_i + \beta_{i+1})$$

NOTES

1. <<http://perso.wanadoo.fr/alain.pichereau/gini.html>> or see Appendix.
2. Such a test produces a similar pattern for GE inequality measures.
3. The first component, *between-group* inequality, indicates how much of total inequality would remain if incomes were equalized within each population sub-group. The *within-group* component captures the amount of inequality that would remain if differences between groups in their average incomes were eliminated, and thus only *within-group* differences would remain.
4. Note that the overall effect of demographic changes is given by the sum of the second term (*b*) and the third term (*c*).
5. This is an approximation to the true decomposition, but both Mookherjee and Shorrocks (1982) and, later, Jenkins (1995) argue that, for computational purposes, this approximation is sufficient.
6. *World Development Indicators*, 2006 (World Bank, 2006). Data are for 2000.
7. Only positive incomes (greater than zero) were considered in the calculations. The figures presented in this paragraph were calculated by the authors from the following data sources: 1) The World Bank, Living Standard Measurement Survey, South Africa, 1993; and 2) Statistics South Africa, Income and Expenditure Survey, 1995, 2000.
8. Datt and Ravallion's decomposition is presented in the Appendix.
9. *Human Development Report*, 2005 (UNDP, 2005).
10. In South African data sources, individuals are classified in one of five pre-defined racial categories: African/Black; Coloured; Indian/Asian; White; Other.
11. For a different context, Ferreira and Leite (2001) have shown that such a trend in the convexity of returns increased income inequality in the Brazilian Province of Ceara by 4 per cent. According to their findings, poor families in Ceara would not be better off as a result of an expansion in education in the state if the increase were associated with a persistence of the convexity of returns.
12. See Appendix.
13. Zero incomes are computed for the Gini coefficient but not for the GE(0).
14. See also Blanchflower and Oswald (1994) for the USA, the UK and OECD countries. One explanation for such a relationship is that in regions with high levels of unemployment, workers accept lower wages because of the difficulty of finding another job. In contrast, in regions with low levels of unemployment, firms searching for workers can be obliged to pay higher wages. As consequence, areas with low rates of unemployment would tend to have higher wages than areas with high unemployment. This would produce a negative relationship between wages and unemployment.
15. The main economic strategies have been the Reconstruction and Development Program (RDP) in 1995 and the Growth, Employment and Redistribution Program (GEAR) in 1998. Labour-market policies have been affected by The Labour Relations Act of 1995; The Basic Conditions of Employment Act of 1997; the Skills Development Act and the Employment Equity Act of 1998 and the Skills Development Levies Act of 1999.
16. In Brazil, Ferreira, Leite and Litchfield (2006) show that in Brazil, well targeted social transfers have helped reduce income inequality since 2001. Unfortunately, data are not available for us to evaluate the impact of similar programs in South Africa. IES 2005 data are not available and LFS surveys include only earnings data.
17. For the period 1995-1999, the correlation was negative while for 2000-2004, it was positive. However, it was non-significant for both periods.
18. Apparently, South Africa has experienced a pattern of correlation between Growth and Inequality that is similar to that for Brazil, Mexico and Indonesia. In these countries, Bourguignon, Ferreira and Lustig (2005) show that an increase in Growth has been accompanied by rising inequality.
19. See Foster, Greer and Thorbecke (1984).
20. The residual term can be interpreted as the interaction between growth and the pattern of redistribution.



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