INCOME INEQUALITY IN SOUTH AFRICA: THE POSSIBLE NEGATIVE EFFECTS OF DECREASING DISCRIMINATION

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While income inequality is a topic of interest in many countries, it is perhaps of special interest in South Africa. For South Africa has major equity issues as a result of its history of legislated political, social, and economic racial inequality under Apartheid. During the Apartheid regime South Africa had extremely high levels of income inequality, as measured by the Gini coefficient. Much of the income inequality under Apartheid was due to the differences between high white incomes and low black incomes. Whites, as just around 20% of the population, received around 70% of total income from 1917 to 1970 (Van Seventer 2000), and between racial group inequality accounting for 62% of total inequality in 1975 (Seekings, Leibbrandt and Nattrass).But while Apartheid, which was often blamed as a source of economic inequality, officially ended in January 1990 (Moll 2000), South Africa's Gini coefficient has remained as high as ever. Thus, the lack of improvement following the end of Apartheid was highly disappointing to many, and prompts us to question whether discrimination has truly decreased? If it has, why is income inequality still so high?

A key issue in light of Apartheid is how the wage differential between blacks and whites has changed. In fact, post-apartheid, and even in the years leading up to the end of apartheid, South Africa's between-race-group income inequality has fallen and the black-white wage gap has decreased. This decrease is likely due to social and economic pressures that decreased labor market discrimination. These pressures could include legislation in the 1980's and 1990's that made it more acceptable to hire blacks (such as the Industrial Conciliation Amendment Act in 1979 which allowed African workers to be

classified as employees (Hofmeyr 2001)); the legalization of black unions in 1980; the

inclusion of blacks in the mining industry; the increasing social acceptance among

younger cohorts; and high growth in the manufacturing sector during the 1960's (Jenkins

and Thomas, 2004). However, while South Africa's between-race-group income

inequality has decreased, within each racial group income inequality has risen. This

increase seems to be the new source of South Africa's high Gini coefficient. In fact,

Whiteford and McGrath (1999) demonstrate that while the between-race-group

contribution to overall inequality fell from 62% in 1975 to 33% in 1996, the within-race-

group contribution rose from 38% of total inequality to 67% during this period.

Why has within-race-group income inequality increased? Some issues discussed

by Jenkins and Thomas (2004) are overall unemployment levels and unions. Increasing

within-race-group inequality could also be due to skill-biased technological change, with

demand for more educated workers increasing relative to lower educated workers. Moll

(2000) suggests the possibility of decreasing discrimination not only causing the decrease

in between-race-group income inequality, but also causing the increase in within-race-

group income inequality. This is an explanation which has not been previously analyzed

and is what I explore in more detail in this paper.

Decreasing labor market discrimination implies that blacks and whites should

both be paid by skill. So in place of discrimination the usual causes of income inequality,

such as ability and education, are dominant. Thus, returns to skill should be increasing as

blacks and whites are evaluated more and more on that basis. In this paper I use a

regression to analyze the change in returns to education for 1980, 1991, and 1993.

However, the analysis is not ideal, especially as census data is used for 1980 and 1991

while Project for Statistics on Living Standards and Development (PSLSD) survey data is used for 1993, and these two data sources are not perfectly analogous.

The empirical results demonstrate that blacks' returns to education did increase from 1980 to 1993. Increasing returns to education accounts for a substantial percentage of the increase in income inequality among blacks. The results for whites are inconclusive. These results imply that greater investment and support for public education could significantly decrease South Africa's overall income inequality.

BACKGROUND AND SIGNIFICANCE

Income Inequality in South Africa has been relatively well researched, though the availability and quality of data poses a considerable challenge. For earlier years, researchers rely entirely on census data. However, for recent years, researchers can also use a series of surveys, primarily the October Household Survey (OHS), the Project for Statistics on Living Standards and Development (PSLSD), and Income and Expenditure surveys (IES). The OHS is a nationally representative survey with approximately 33,000 households, which was conducted annually, starting in 1994, by Statistics South Africa. The IES were also conducted by Statistics South Africa, cover 25,000 households, and is available for 1995 and 2000. The PSLSD survey was carried out by the South African Labor and Development Research Unit (SALDRU) of the University of Cape Town, is available for the year 1993, and covers approximately 9000 households.

In order to demonstrate the stagnation of overall income inequality, Table 1 charts the Gini coefficient for South Africa from 1959 to 1995 (Jenkins and Thomas 2004). The Gini coefficient is a measure of dispersion commonly used in economics. A Gini coefficient of 0 denotes perfect equality, while 1 denotes perfect inequality. While at first

glance, there does seem to be variation among Gini coefficients, calculations done by the

same authors (each of whom use relatively different original data sources and methods)

show very small changes, if any. With these Gini values, South Africa is one of the most

unequal countries in the world. These values are far higher than those of comparable

upper-middle income countries, as shown in Table 2.

Table 1: Gini coefficients for overall population for different years

Year	Gini	Income Definition	Recipient	Source
1960	0.55	Income	Person	Lachman and Bercuson (1992)
1965	0.56	Income	Person	Lachmann and Bercuson (1992)
1970	0.53	Income	Person	Simkins (1979)
1975	0.49	Income	Person	McGrath (1983)
1976	0.65	Income (formal)	Person	Lachman and Bercuson (1992)
1980	0.50	Income	Person	Lachman and Bercuson (1992)
1985	0.51	Income	Person	Lachman and Bercuson (1992)
1987	0.48	Income	Person	Lachman and Bercuson (1992)
1990	0.63	Income	Urban Household	Hirschowitz (1997)
1991	0.68	Income	Household	Whiteford and McGrath (1999)
1993	0.50	Income	Person	*
1995	0.59	Income	Household	Hirschowitz (1997)

*Source: Jenkins and Thomas 2004, *my own analysis using the PSLSD*

Table 2: South Africa and Other Countries' Gini Coefficients

Country	GDP per head (PPP US$ 1995)	Gini coefficient
Chile	9930	56.5
Thailand	7742	46.2
Brazil	5928	60.1
Ecuador	4602	46.6
Romania	4431	28.2
South Africa	4334	59.3
Indonesia	3971	36.5
Peru	3940	46.2
Philippines	2762	42.9
Zimbabwe	2135	56.8
Tanzania	636	38.2

Source: Jenkins and Thomas 2004, based on survey data from various years between 1990 and 1996

The Thiel indices in Table 3 demonstrate the concomitant decrease in between-race-group income inequality and increase in within-race-group income inequality. The Thiel index "can be interpreted as the logarithm of a weighted geometrical mean or the logarithm of the geometrical mean of the 1st moment distribution function" (Nygard 1981). From Table 3 we see that between-race-group inequality has fallen from 0.23 in 1975 to 0.13 in 1996. The per capita income disparity ratios in Table 4 give further evidence on decreasing between-race-group inequality. The disparity ratio shows that in 1970 white per capita income was 15 times higher than black per capita income, while in 1996 white per capita income had fallen to 8.8 times higher. However, increasing within-race-group inequality works against falling between-race-group inequality. For Table 3 also shows that the Thiel index of within-race-group inequality increased from 0.14 to 0.27. Hence, as discussed previously, within-race-group income inequality seems to be the primary culprit for South Africa's current high income inequality.

Table 3: Thiel Index

	Thiel Index			Relative Contribution		
	1975	*1991*	*1996*	*1975*	*1991*	*1996*
Within Population Group Inequality	0.14	0.23	0.27	38%	58%	67%
Between Population Group Inequality	0.23	0.16	0.13	62%	42%	33%
Total Population	0.37	0.39	0.40	100%	100%	100%

Source: Van Seventer 2000

Table 4: Disparity Ratios, Whites to Blacks
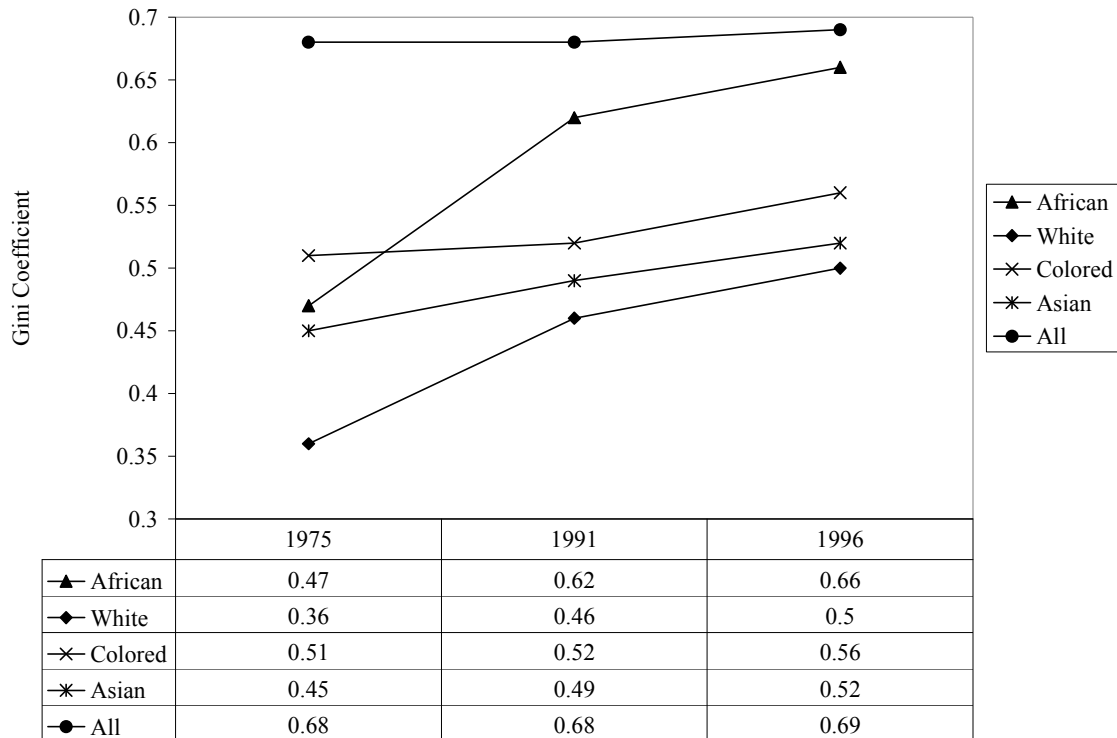
	1970	1980	1991	1996
Blacks	15	12.9	11.1	8.8

Source: Van Seventer, 2000

More specific measurements of within-group inequality are given in Figure 1. Figure 1 gives the Gini coefficient of income inequality within each racial group for the years 1975, 1991, and 1996. These figures show that income inequality has increased within every racial group. The biggest increase occurred among Africans (blacks).

Figure 1: Within-Group Income Inequality for each Race

	1975	1991	1996
─▲─ African	0.47	0.62	0.66
─◆─ White	0.36	0.46	0.5
─✕─ Colored	0.51	0.52	0.56
─✶─ Asian	0.45	0.49	0.52
─●─ All	0.68	0.68	0.69

Source: Within Group Gini Coefficients given in Van Seventer, 2000

While I will focus on decreasing discrimination as a cause of increasing within-race-group inequality, there are many other possible causes, including changes in unemployment, skill-biased technological change, international trade, and union activity.

Unemployment

Often the unusually high unemployment rates around 20% in South Africa are almost entirely attributed to unions and collective bargaining. However, recent studies have found this to be only partially true. In fact, wages in South Africa are measured to

be just as responsive to unemployment as in OECD countries (Kingdon and Knight, 2006). This makes unemployment an important factor in income inequality in its own right.

From 1990-2000, formal sector employment fell 1.2% annually while the labor force grew 3.4% annually (Kingden and Knight 2006). This corresponds with the increasing unemployment rates that existed during this decade. Females, blacks, and those who are less educated (lower income groups) tend to have the highest probability of being unemployed. In fact, the black unemployment rate was an astounding 41.2% in 2002 (Thomas and Jenkins 2004, Kingdon and Knight, 2004). Thus, as unemployment increases, there is greater competition for low-skilled jobs, putting downward pressure on the lower end of the wage distribution.

Skill-Biased Technological Change

This explanation focuses on the potential of increased returns to skill due to changes in technology. New technology being used in South Africa, as in other upper and upper-middle income countries, seems to provide capital that substitutes for low skilled labor and complements high skilled labor. Thus, as the new capital inputs become cheaper and are more widely adopted, there will be increased returns to skill. Edwards (2001) analyzes the changes in demand for labor and finds that what cannot be explained by other factors (the component usually attributed to technology) is statistically significant. However, this does not definitively establish technology's role in the increase in demand for more-educated workers relative to less-educated workers. Much more study is warranted in this area.

International Trade

South Africa's pattern of trade has been characterized by a shift away from labor-intensive production towards capital-intensive production. Labor-intensive production tends to employ low-skilled workers while capital-intensive production tends to employ high-skilled workers. This could cause increasing within-race-group income inequality in the same way that it would increase inequality overall, by decreasing the relative demand and wages of low-skilled labor, and increasing the relative demand and wages of high-skilled labor. For indirect evidence on this phenomenon, we can refer again to Edwards (2001). As the data suggests, and as Edwards himself concludes, employment has been lost due to imports, though the loss has been approximately matched by gains in employment in exporting sectors. However, this result would exacerbate income inequality, by increasing employment and wages of high-skilled workers at the expense of low-skilled workers.

Unions

South Africa's rate of union membership is one of the highest among developing countries (Barker and Dockell, 1999). South Africa's union members on average have higher earnings than non-union members, and the gap between union members' earnings and other employees' earnings has risen from 8% in 1985 to 26.5% in 1993 (Hofmeyr and Lucas, 1999). Under the South African Industrial Conciliation Act of 1956, multiracial unions were illegal. But in 1979, this act was amended to allow African workers to join unions and African unions to legally exist, allowing for greater collective bargaining power across races. While certain non-whites' wages increased rapidly after the elimination of union discrimination, the increase in union membership also caused

increased segmentation of the labor market. This segmentation was no longer strictly between whites and non-whites, but rather between racially mixed union members and non-union members. In fact, while the fraction of regularly employed men fell from 54.5% in 1985 to 45.6% in 1993, the fraction of regularly employed men who were also union members rose from 14.7% in 1985 to 21.3% in 1993 (Hofmeyr and Lucas, 1999). This change in composition corresponds with the fact that between-group inequality fell between 1975 and 1991 while within-group inequality rose in the same period.

Thus, union membership is an especially attractive explanation for income inequality in light of the anomaly of rising average wages (with some estimates of 3.3% rise per annum) in the formal sector along with rising unemployment (van Aswegen, Steyn and Hamman, 2005). However, while the increase in the union premium could be due to differences in pay between union and non-union employees, it could also be the result of unobserved heterogeneity, which has also changed along with the unions' changing composition.

THEORETICAL FRAMEWORK

I will focus my own analysis on decreasing discrimination as a cause of increasing within-race-group income inequality, building on work done by Moll (2000). Moll uses 1980 microcensus and PSLSD data to measure whether changes in the nature of inequality corroborate what he predicted would occur, and also to separately measure whether labor market discrimination (LMD) did, indeed, decrease. He finds first, that changes in between-group and within-group inequality are in the direction that he predicted and second, that LMD did decrease for all occupations except professionals.

However, while Moll does theoretically discuss how decreasing discrimination could cause increasing within-race-group income inequality, he does not directly analyze this.

Using a similar conceptual framework to Moll (2000), I create a model to test how decreasing discrimination could cause increasing within-race-group income inequality. Decreasing discrimination, both in terms of LMD and pre-market factors, is an obvious explanation for decreasing between-race-group income inequality. However, decreasing discrimination could also cause increasing within-race-group income inequality by causing the following changes in income distributions.

Decreasing LMD means blacks and whites are paid more equally for their productivity. So whereas previously, the black income distribution had suffered from a ceiling on earnings, compressing the natural shape of the distribution, the distribution is now allowed to respond to rewards to ability. Thus, blacks who had previously had the skills to advance are able to do so and white employers who no longer view blacks as inherently less capable invest more in blacks' on-the-job training than they would have previously. Consequently, the higher end of black income distribution is pulled right, as blacks of higher ability earn much more than blacks of lower ability.

In addition, whites who had previously been promoted over blacks with higher skills and ability are less likely to continue enjoying such rents, and some will fall into lower level occupations with lower wages. However, whites in the highest paying occupations did not suffer from a substantial increase in competition and continued to dominate the higher end of the distribution. This occurs because while pre-market factors, such as access to education, may have become more equal, these changes take time. Relative to their population size, few blacks have attained the highest educational levels,

though blacks have enjoyed substantial increases in educational attainment overall. Thus, the high income whites combined with the increasing numbers of whites in the lower end of the distribution caused higher income inequality amongst whites. In essence, this explanation suggests that in place of inequality between races, the usual causes of income inequality, such as ability and education, return.

Ideally, this study would use repeated cross sections to measure the changes in returns to skills for large groups of specific individuals of each racial group over time. Unfortunately, no such data is available. Instead, using survey data from the Project for Statistics on Living Standards and Development (PSLSD) (1993), I will conduct a cross-sectional analysis of income inequality and examine the validity of this explanation, using Moll's work as a foundation.

Thus, I will attempt to examine whether the decline in discrimination affected within-race-group income inequality. I will go about this indirectly. I am trying to examine whether employers started to judge blacks and whites primarily on ability, not race. And as I do not have a measure of skill, such as the AFQT test which is used in United States' studies of ability and earnings, I must rely on education as my measure of skill. This is not ideal because education does not entirely capture the greater returns to skills like "soft skills" that blacks may be receiving. A few studies have attempted to more fully measure skill. They find that while other skills do seem to play a larger role in South Africa than in richer countries, these skills do not affect the measured returns enough to disregard results that solely focus on education (Moll 1998). Thus, I will estimate a log wage regression with education as the key explanatory variable. I will compare the returns to education, overall and by race, to the results of the study "Racial

Differences in Occupational Status and Income in South Africa, 1980 and 1991", by Treiman, McKeever and Fodor (1996). If Moll's hypothesis is correct, the returns to education should have increased for each racial group. Returns to education increase because blacks' educational attainment and skills are valued equally to those of whites, while whites, who may have previously advanced with less education will have lower earnings, causing the earnings difference between education groups to increase for whites.

MATERIALS AND METHODS

I will be attempting to compare returns to education in 1993 to previously calculated returns to education for 1980 and 1991 calculated with census data by Treiman, McKeever and Fodor (1996). Using the 1993 PSLSD data set, I will estimate a regression of log earning on education along with a series of other independent variables, including self-employment, government employment, language, and labor force experience. I include these other variables both to distinguish the specific returns to education but also to follow as closely as possible the regression used by Treiman et al. I restrict my sample to men aged 20 and older who have a job and have positive income, in order to focus only on labor market activity. Thus, my regression function will be in the form of:

Logtotalincome = β_0 + β_1(Education) + β_3(Experience) + β_4(Experience)^2 +

β_5(Language) + β_6(Government) + β_7(Self-Employment) + β_8(Occupation)

Where:

Education runs from 0-19, with 0 representing no schooling, 1 representing completion of grade 1 (first year of preschool), and so on through advanced degrees. While this

measurement differs to some degree from Treiman et al., the difference exists primarily because the PSLSD data does not distinguish whether or not individuals obtained school leaving certificates. Treiman et al. added 1.5 to schooling levels of those who had obtained the certificates. β_1 is the variable of interest for the hypothesis that decreasing LMD causes increasing returns to educaiton. It is expected to be positive and larger than previous years. Treiman et al. also include an education squared value, which I will refer to as β^*. The education squared value essentially acts as a second derivative, measuring the rate of change of the change in total income due to changes in education. I did not include this variable, as it caused the coefficient to be negative for whites. This is likely due to the small sample size and lack of lower levels of education among whites, which could cause the first part of the graph to be downward sloping. In fact, Keswell and Poswell (2004) also have negative coefficients for education when they include the education squared value in 1993, and they find further that returns to education appears to be convex overall, and downward sloping in the first part of the graph.

Experience is measured using the conventional standard of age-education-6, as actual experience is not available. β_3 is expected to be positive, while β_4, if South Africa follows the trends of other countries, is expected to be negative.

Language is a dummy variable that equals 1 if English is the language spoken at home, and equals 0 if any other language is spoken at home. While Treiman et al. have this variable equal 1 if the respondent can read, write, and speak English, there is no identical measure in the PSLSD. Because English has historically been associated with higher-income whites, β_5 is expected to be positive.

Government is actually composed of two dummy variables, for there are really two distinct forms of government employment: employment in public administration and employment in public business. The variables equal 1 if the individual is employed in the sector and 0 if he is not. B_6 may be negative for whites. This is so, because whites at the lower end may have historically depended on government employment as a crutch, or as a quasi welfare system, so lower income whites would be associated with these jobs.

Self-Employment is a dummy variable that equals 1 if the individual is self-employed and 0 if he is not. β_7 is usually positive, as those who are self-employed enjoy the profits. However, in South Africa many of those who are self-employed are informally employed, a sector which is not as lucrative, so β_7 may be negative.

Occupation represents a matrix of 11 dummy variables for the 11 different occupation categories used in the PSLSD. The occupations include professionals, managers and administrators, clerical work, service occupations, transportation and communication, farming, artisans, production foreman and supervisors and miners, operators and productions workers, laborers, and other occupations. Treiman et al. measure occupation by using the International Socioeconomic Index of Occupations (ISEI) which, for South Africa, runs from 0 to 73. Using occupation could cause a downward bias on returns to education. I do not include the 11 occupation coefficients in my tables, but for summary statistics of occupations, see the appendix.

RESULTS

Table 5 gives summary statistics for each of the independent variables for the sample used in the regression. Note in particular the large difference between the average level of education for blacks (5.11) versus whites (11.03). Also, there are very few blacks

who are self-employed. This is also true for earlier years and larger samples. Treiman et al. find that in 1980, 1.4% of blacks and 14% of whites were self-employed, and in 1991 4.8% of blacks and 21.1% of whites were self-employed.

Table 6 shows the regression results for the years 1980, 1991, and 1993. The values for 1993 come from my regression, while the values for 1980 and 1991 are from the computations done by Treiman et al. The 1980 and 1991 regression includes an education squared variable. This education squared variable means that the coefficient on education for 1993 is not directly comparable to those for 1980 and 1991. However, comparable values for returns to education can be calculated for specific years of schooling by using the following equations, where X=X years of schooling.

1980 and 1991:

$$y = \ldots + \beta_1 X + \beta*X^2$$

So returns to schooling $= \partial y / \partial x = \beta_1 + 2\beta*X,$

1993:

β_1

Table 5: Descriptive Statistics

	Blacks 1980	Blacks 1991	Blacks 1993				Whites 1980	Whites 1991	Whites 1993			
	Mean or % of Population	Mean or % of Population	Mean	Min	Max	Standard Deviation	Mean or % of Population	Mean or % of Population	Mean	Min	Max	Standard Deviation
Education	3.0	4.5	5.1120	0	16	3.6800	9.3	10.0	11.0345	0	19	3.9013
Language	34.4%	39%	.0027	0	1	.0520	96.7%	97%	.3438	0	1	.4753
Labor Force Experience	26.3	26.4	26.9217	1	72	12.5218	22.5	22.5	20.9640	0	65	11.3752
Labor Force Experience Squared	-	-	881.5147	1	5184	784.3616	-	-	568.6561	0	4225	562.3009
Self-Employed	1.4%	4.8%	.0042	0	1	.0651	14%	21.1%	.0661	0	1	.2487
Employed in Public Administration	12.2%	12.0%	.0903	0	1	.2866	18.3%	17.0%	.1035	0	1	.3049
Employed in Public Business	5.7%	3.3%	.0709	0	1	.2567	15%	10.6%	.0633	0	1	.2436

Source: Data computed from PSLSD data set

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Table 6: Coefficients of Models of Determinants of Total Income for 1980, 1991, 1993

|	Blacks Number of Observations = 2580			Whites Number of Observations = 695		
	1980	1991	1993	1980	1991	1993
R^2	.255	.208	.4301	.294	.292	.2941
Constant	7.54	7.32	7.8651 (.6343)	8.45	7.56	9.1140 (.4075)
Education	.0757	.0617	.0927 (.0048)	.0609	.124	.0259 (.0060)
Education-Squared	-.00394	.000256		.00165	.000860	
English-Language Competence	.102	.0293	.2989 (.2404)	.261	.230	.1817 (.0453)
Labor Force Experience	.0304	.0439	.0383 (.0044)	.0775	.0980	.0471 (.0070)
Labor Force Experience-Squared	-.00045	-.00061	-.00043 (.000068)	-.00121	-.00138	-.00070 (.000140)
Self-Employed	-.240	-.276	.2755 (.1916)	.155	.0289	.5295 (.0882)
Employed in Public Administration	-.0212	-.0627	.1747 (.0494)	-.311	-.273	-.1259 (.0722)
Employed in Public Business	.231	.226	.1951 (.0488)	-.0370	.0117	-.0205 (.0880)

Source: 1980, 1991 data from Treiman et al. computations from census data (1996), 1993 data computed from PSLSD

In terms of the returns to education, while the studies are not directly comparable with the education squared term omitted in my calculations, the returns for education for blacks increases to .0927, so that every extra year of school increasing earnings by 9.27%. This is a large return and it is statistically significant. In comparing this value to earlier years we find that, for example, 7 years of schooling would have increased total income by approximately 47.47% in 1980, 43.54% in 1991, and 64.87% in 1993 (Shown in Figure 2). Thus, for blacks it seems that returns to education has risen significantly from 1991 to 1993, supporting the LMD hypothesis. Blacks' increasing returns to education as evidence of decreasing LMD causing increasing returns to skill is

corroborated by studies that find increasing upward mobility within occupations for blacks, such as Moll (1998) and Seekings (2003).

However, for whites the returns to education seems to have actually fallen from 1991 to 1993. Seven years of schooling would have increased total income by approximately 44.94% in 1980, by 88% in 1991 and by 18.13% in 1993 (shown in Figure 2). This is not consistent with the prediction that whites, who are no longer artificially held up at the lower end of the distribution, will experience higher returns to education as wages fall for lower levels of educational attainment and rise for higher levels of educational attainment.

Figure 2: Percentage Change in Total Income with 7 Additional Years of Schooling
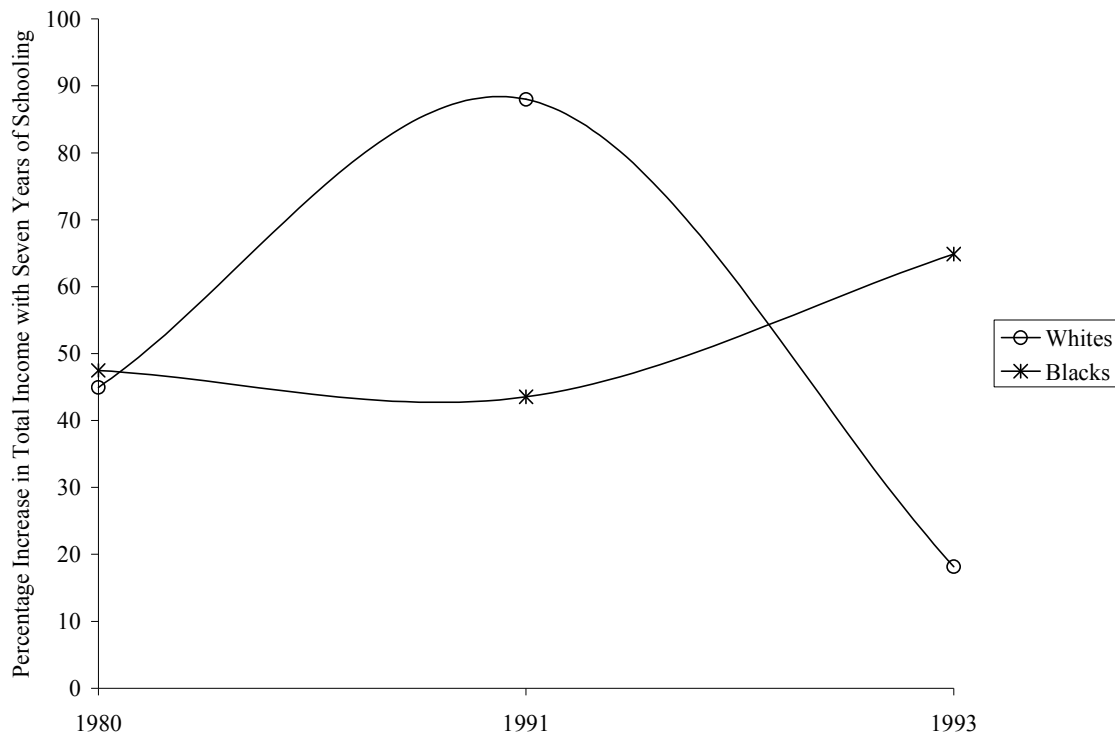
Source: 1980 and 1991 Data from Treiman et al

As regards the rest of our coefficients, most seem to generally follow the values of previous years. In keeping with my predictions, the coefficients on experience are

positive while those on experience squared are negative and very small. The coefficients for employment in a public business also follow our predictions. However, there are some differences in my results. For example, the coefficient for self-employed for blacks is .2755, which goes against my prediction and earlier trends. However, the standard error for this coefficient is .1916, so this value is not statistically significant. This is likely due to the small number of blacks who are self-employed, which limited the number of values that could be used for calculation. In fact, there were fewer than 70 individuals who reported themselves as self-employed, and the majority of those were white. Other differences, such as the language coefficient for blacks, the intercept for Blacks, and the intercept for whites, with standard errors of .2404, .6343, and .4075 respectively, are also statistically insignificant. Thus, most of the anomalies are not statistically significant.

In terms of the surprising results for whites, a couple of explanations come to mind. First, whites have continually enjoyed higher quality education. While recently the percentage of government expenditures allocated to education has increased, there has been little evidence that previously disadvantaged groups have seen much improvement in quality, though there has been an increase in quantity of education. Further, whites continue to have higher levels of educational attainment. In 1993, whites on average had 11.6 years of schooling while blacks only had 6.8 years of schooling (Hertz 2001). Blacks' low levels of education is the result of the policy to provide only basic education for blacks up until around 1970 (Jenkins and Thomas 2003). This policy was implicit in the Bantu Education act of 1953 which created a separate educational system for blacks. The author stated that the purpose of the system was to prevent blacks from getting educations for jobs that they would not be able to hold in the community, although the act

did not explicitly ban blacks from higher education. Thus, lower-skilled whites continue to have more and better educations than lower-skilled blacks and are less likely to experience falls in income, even as blacks experience gains (Jenkins and Thomas 2003, Case and Deaton 1999). This would explain why returns to education didn't increase, but it does not explain the large decrease in returns.

CONCLUSION

The empirical results support the hypothesis that blacks' returns to education did increase following the end of apartheid, and increasing returns to education accounts for a substantial amount of the increase in income inequality among blacks. In fact, the regression accounts for 43.01% of the variation in income for the working black males in my sample. This increase in returns to education is attributed primarily to decreasing LMD. As blacks with higher education levels experience higher incomes, the upper tail of the black income distribution will be pulled to the right, and variation in incomes will increase. Even so, the average education level and average income are increasing for blacks, so the increasing income inequality amongst blacks is not necessarily a negative thing (Whiteford and van Seventer 2000). The empirical data on whites is inconclusive, for while decreasing LMD could possibly have caused increasing within-group inequality from 1980 to 1991, the decrease in returns to education from 1991 to 1993 is puzzling.

However, one of the major weaknesses of my analysis is the large difference between the questions in the census and PSLSD surveys, and this could be part of the reason why my coefficient for whites is so different than the coefficient in 1991 computed by Treiman et al. Ideally, the regression should be computed using the most

recent census data. Not only would this data be more directly comparable to the 1980 and 1991 data, but it would also give a larger sample to work with.

   If education is the source of the high levels of income inequality in South Africa, the best way to address this issue is to make a concerted effort to increase quantity and quality of schooling among all South Africans.

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Appendix:

Table A: Occupational Summary Statistics

	Blacks 1993				Whites 1993			
	Mean	Min	Max	Std. Dev.	Mean	Min	Max	Std. Dev.
Professionals	.0639	0	1	.2447	.3093	0	1	.4625
Managers	.0089	0	1	.0940	.2057	0	1	.4045
Clerical and Sales	.0767	0	1	.2662	.1021	0	1	.3030
Transportation and Communication	.1069	0	1	.3091	.0489	0	1	.2158
Service	.1069	0	1	.3091	.0661	0	1	.2487
Farming	.0798	0	1	.2711	.0115	0	1	.1067
Artisan	.0713	0	1	.2574	.1654	0	1	.3718
Production Foreman and Supervisors	.0488	0	1	.2155	.0532	0	1	.2246
Operators, Production Workers, other Semi-Skilled	.1306	0	1	.3370	.0316	0	1	.1752
Laborers	.3042	0	1	.4601	.0028	0	1	.0536
Other Occupations	.0011	0	1	.0340	.0028	0	1	.0536