Paper Presented at the Joint AARE/
NZARE Conference, Geelong, 1992
Australian Association
for Research in Education

RESOURCE DISTRIBUTION IN EDUCATION AND INCOME
DISTRIBUTION IN SOUTH AFRICA
Dr. M.A. Marais1

I.Introduction

Both income inequality and inequalities in education have been the source
of much social and
political discontent in South Africa. As the process of political change
in the country
continues inexorably, both these issues are likely to receive increasing
attention. This paper
gives attention to some dimensions of these problems and their
interrelationship.

Until recently, there was almost complete racial segregation in both
primary and secondary
education in South Africa for the four racial groups (blacks, coloureds,
Asians and whites)
as defined in that country, and the separate facilities were highly
unequal. I analyse below
the extent of inequality in resource allocation in education in South
Africa and how this has
changed over time. In addition, I consider whether education and the
distribution of earnings
have been related in that country. The evidence suggests that there is a
relationship between
education and income distribution in south Africa. This implies that any
reforms which create
a more equal distribution of education might contribute towards a
distribution of earnings that
is less unequal in the longer term.

II.Measuring Equality of Resource Allocation in Education

Comparisons of average spending per pupil per annum do not give us the
whole story on
inequality in resource allocation, partly because such comparisons do not
take into account
the differences in number of years of education that different individuals
and groups receive.
A tool used in economic analysis, the Lorenz curve framework, allows us
much better to
analyse the distribution of education and between various groups (see
Mingat and Tan, 1985).
In essence, a cohort is selected and government subsidies for different
sub-groups in the
cohort are calculated over the formal education years of the cohort.

Comparisons can then

be made between the different sub-groups.

An example serves to outline the approach. Consider a cohort of 200 children of which 40
receive no schooling whatsoever, 80 receive primary schooling only, 60 receive primary and
secondary schooling, and 20 receive primary, secondary and tertiary schooling. Provided that
the expenditure per pupil/student and the number of years spent at each level are known, it
is a relatively simple matter to determine the distribution of resources amongst the cohort over
the formal education years of the cohort. If it took seven, five and four years to complete
primary, secondary and tertiary education, and if the per annual pupil/ student costs that were
borne by the government were $100, $200 and $400 respectively, then those who completed
primary schooling only would receive $56,000 (80x7x$100), those who completed primary
and secondary schooling would receive $102,000 (60x7x$100 plus 60x5x$200), and those
who completed primary, secondary and tertiary education would receive $66,000. In this
example, 20% the cohort clearly receive nothing from the government towards education;
40% of the cohort receive 25% of government resources spent on the education of the cohort;
30% receive 45.5% of the resources spent on the education of the cohort; and 10% receive
29.5% of government spending on the education of the cohort. I applied this approach to
South African data, and further subdivided groups on a racial basis as well.

I obtained data for two cohorts - one aged 6 in 1970 and one aged 6 in 1985. Enrolment
ratios were used to estimate the proportion of a cohort that received any level of education.
These are shown for each of the racial groups in Table 1 for both 1970 and 1985. Despite
very encouraging improvements in black enrolments, the differences between whites and
blacks were still marked in 1985 and 20 per cent of the relevant black age group did not enter
primary school at this time. Enrolment ratios for Asians and coloureds fall in between thoseof blacks and whites. It is assumed that the

Paper Presented at the Joint AARE/
NZARE Conference, Geelong, 1992
Australian Association
for Research in Education

enrolment ratios in 1970 pertained over the life
of a cohort aged 6 in 1970 and those in 1985 remain so over the formal education years of
a cohort aged 6 in 1985. Although this assumption can be questioned, it must be borne in
mind that a comparison is being made between two time periods and the same assumption
has been used in both cases.

TABLE 1
Enrolment Ratios in South Africa 1970 and 1985

	Blacks		Asians		Coloureds		Whites	
	1970	1985	1970	1985	1970	1985	1970	1985
Primary								
Secondary								
Tertiary	65							

10

0.5   80

35

1   100

58

5   100

95

15   90

26

2   96

57

4   100

84

20   100

95

28

Source:Calculated from Central Statistical Services (1986), Department of Statistics (1974), and taking
account of Trotter (1976); Corke (1979-80) unpublished; Blignant (1981), as well as
discussions held with the Department of Education and Training, the Department of National
Education and the Education Unit at the University of the Orange Free State.

Table 2 shows spending per pupil by level of education in 1970 and in 1985 for the four
population groups in South Africa. Differences are again most dramatic between whites andblacks at the primary and secondary level; while the ratio of government spending per black
child to that per white child has increased over time, government spending per black child
at the primary level was little over one-tenth of that per white child in 1985.

TABLE 2
Spending per Pupil by Level of Education (R current)

   Blacks

1970   1985   Coloureds

   1970   1985   Asians

   1970   1985   Whites

   1970   1985Primary

Secondary

Tertiary   21

   113

2,087 249

   552

5,500   92

   120

 1,155   692

1,073

5,500   112

   156

1,384   937

1,474

5,500   366

   624

   936 2,044

2,504

 5,500
Source:Malherbe, 1977. Trotter, 1988.

Tables 3 and 4 give the results of the computations, and these are reflected also in Figure 1.
The distribution of resources to education was highly unequal for both cohorts. For example,
although blacks constituted over 74.3 per cent of the relevant cohort in 1970, they would have
received only 17.2 percent of all resources devoted to the education of that cohort. Whites
would have received 67.1 percent of all resources spent on the education of the 1970 cohort,
but represented only 12.2 per cent of the cohort. Overall, 27.1 percent of the cohort did notreceive any of state resources spent on the education of the cohort and 3.1 percent of the
cohort obtained over ten times its proportionate share of resources.

While the distribution of resources in education is much more equal for the 1985 cohort than
the 1970 cohort, it is nevertheless very unequal. Just over one-sixth of the 1985 cohort will
not receive any government resources for education;   40% will receive around 15% of the
resources devoted to the education of the cohort; two-fifths of the cohort will recive three-
fifths of the resources; and around 4% of the cohort will receive six times its proportionate

share (by the year 2,000).

A Gini coefficient2 was also calculated for each of the cohorts. For the uninitiated, the higher
the Gini coefficient, the greater the inequality in distribution of resources in education (the
Gini coefficient can vary between 0 and 1). The Gini coefficient fell from 0.66 for the 1970
cohort by 20% to 0.53 for the 1985 cohort.

A similar exercise for developed and developing countries gives Gini coefficients of 0.27 and
0.63 (using data for 1980) (see Table 5). The distribution of resources in educatin in South
Africa is thus not as unequal as that in developing countries, but is significantly more unequal
than that in developed countries. The racial bias in the inequality, however, is very
problematic.

The inequalities in South Africa could be addressed by redistributing resources in education
or spending more on education. Government spending on education has been around 4.5 to
5% of GDP - this is above that for many countries with a similar per capita GDP. It is thus
not clear that higher government spending can be relied upon to address inequalities. Thereare, of course, very many redistribution options, and I mention only one to give an idea of
the size of the problem and the redistribution gains that might be achieved. If ability is not
a limiting factor, there is no reason why all black and coloured children should not receive
primary education. If government spending per white child were cut by around 20% at the
primary level and if the government subsidy to all tertiary students was halved, and if all
savings so generated were channelled into primary education for black and coloured children,
a significantly more equal distribution of resources would be achieved (see Figure 1, the "adj
prim/ter 1985" graph). That change would of course not bring about equality between the
groups. It would, however, mean that whites would on average receive resources for
education equal to only 2.7 times their proportionate representation in the population
(compared with 5.6 on the 1985 data) while blacks would receive 0.56 of their proportionate
share (compared to 0.45).

TABLE 3
Distribution of Resources in Education of
Cohort Aged 6 in 1970

No Education
ci   ri
Primary Only
  ci   ri(Primary,
Secondary)
 ci   ri(Prime/Sec/
Tertiary)
   ci   ri
   Total
 ci   riW

B

C

A

T   0

26.0

   0

 1.1

27.1 0

   0

   0

0

0 2.0

40.8

1.2

6.8

50.8 6.0

7.2

1.2

5.2

19.6 7.8

7.1

1.5

2.6

19.033.6

6.0

2.8

3.8

46.2 2.4

0.4

0.1

0.2

3.127.5

4.0

1.2

1.5

32.212.2

74.3

2.8

10.7

10067.1

17.2

5.2

10.5

100

W = Whites, B = Blacks, C = Coloureds, A = Asians, T = Total
Ci = Percent cohort
ri = Percent resources

TABLE 4
Distribution of Resources in Education of
Cohort of Age 6 in 1985

No Education
ci   ri
Primary Only
  ci   ri(Primary,
Secondary)
 ci   ri(Prime/Sec/
Tertiary
  ci   ri
   Total
 ci   riW

B

C

A

T   0

16.0

0

0.3

16.7 0

0

0

0

0   0.4

37.0

2.9

0.1

40.4 1.0

11.1

2.4

0.1

14.6 5.6

28.0

3.9

1.7

39.225.9

21.7

6.9

4.0

58.3 2.3

0.8

0.3

0.3

3.719.7

3.8

1.6

1.8

26.9 8.3

82.2

7.1

2.4

10046.6

36.6

10.9

5.9

100

W = Whites, B = Blacks, C = Coloureds, A = Asians, T = Total
Ci = Percent cohort
ri = Percent resources

TABLE 5
Distribution of Educational Resources
(1980) (enrolment ratios)

No

Education
c_i r_i

Primary Only
c_i r_i
Primary and
Secondary
c_i r_i Primary,
Secondary
and Tertiary
c_i r_i Gini
Co-
efficient
G Developed
Countries

Developing
Countries --

14.1 --

0 21.7

54.7 9.4

17.9 48.3

23.8 43.9

30.6 30

7.4 46.7

51.5 0.27

0.63

Source: Calculation original. Sources used for enrolment ratios and costs included UNESCO (1988), World Bank (1988), and Kurian (1988). It was assumed that number of years spent at primary, secondary and tertiary education were 6,6 and 4.

ci = Percent cohort; ri = Percent resources

III) Education and Income Inequality

Both labour market theorists and those who study the economics of education have been
fascinated by the issue of whether inequalities in education are related to inequalities in
earnings. I consider below whether there is some evidence for South Africa which supports
the human capital view on education and earnings inequality, focussing on three main issues:

i) do those with similar levels of education earn similar incomes, irrespective of
racial group and, if not, what economic explanations may be given to account
for these disparities?

ii) are increases in the average level of education accompanied by a narrowing or
widening of income dispersion within and across racial groups?

iii) is the distribution of education systematically related to the distribution of
earnings?

There is no concensus on the theoretical link between education and the distribution of
earnings in the literature. The human capital school contends they are closely related, while
there are a number of opposing schools of thought that maintain that there is either no
relationship or that it is very weak (see Sahota, 1978; Cain, 1976).

The human capital school argues that education makes individuals more productive and,
provided productivity is closely related to earnings, a more equal distribution of education
would be associated with a more equal distribution of earnings. Becker and Chiswick (1966),
for example, found evidence for the USA, Canada, Mexico, Israel and Puerto Rico which
supported the hypothesis that a more equal distribution of education is associated with a more
equal distribution of earnings (see also Chiswick, 1974; Mincer, 1974).

The predominant view amongst the human capital school on the racial

distribution of earnings
is that market forces will in the longer term erode artificial wage
differences that have arisenas a result of discrimination, and that
improvements in information about certain groups
would lead to greater equality in earnings between blacks and whites.
Differences in earnings
between blacks and whites with similar qualifications could, however, be
explained in part
by differences in quality of education. Public policy that creates a more
equal distribution
of opportunities for education would assist in improving an unequal
distribution of income
(see Christian and Stroup, 1982).

The human capital school, however, is divided on whether income dispersion
changes in a
systematic way as the average level of education rises. Here, Becker and
Chiswick (1966)
and Mincer (1970) argue that earnings of those with fewer years of
education are likely to
be more narrowly clustered around the mean than the earnings of those with
more education.
They argue that since individual abilities are not monolithic and the cost
of obtaining funds
for education generally varies between individuals, individual demand and
supply curves for
education are likely to vary considerably, and there would be no systematic
relationship
between level of education and the rate of return to that education. If
that is the case, it can
be shown mathematically that the higher the level of education, the greater
would be the
variance of earnings (assuming earnings and education are related). Marin
and
Psacharopoulos (1976), on the other hand, argue that there is a plethora of
international
evidence which shows that the private rate of return on education
consistently decreases as
the level of education increases. If the rate of return falls
significantly as the level of
education rises, increases in educational level could be accompanied by a
narrower dispersion
of earnings.

There are of course many different schools of thought that deny that there
is any relationship
between education and its distribution and the distribution of earinings.
Supporters of the

screening hypothesis or segmented labour market theory (see Thurow, 1975; Dore, 1976;
Arrow, 1973), for example, argue that education is a selection device at the point of hiring,
and that individual pre-employment skills are almost irrelevant in determining positions
actually filled. The number and type of jobs available in an economy are technologically
determined, with wages attached to jobs (not individuals). Wages are determined largely by
institutional factors and custom. Workers join a queue to compete for jobs and are ranked
by employers according to a number of background characteristics and the training costs
employers expect to incur in teaching encumbents to perform their tasks. Those with the
lowest prospective training costs rank highest in the queue. A more equal distribution of
education could do little to alter incomes associated with those jobs. Thurow (1972), for
example, showed that despite the fact that the share of years of educational attainment of the
lowest fifth of adult white males in the United States increased significantly between 1950
and 1970, their share of total money income declined, and exactly the opposite ocurred for
those at the top of the education spectrum.

Bowles and Gintis (1976), adopting a different approach, have argued that the principal
function of education is to perpetuate the status quo through a facade of meritocracy, and this
is made palatable to the masses because education is, in principle at least, open to all.
Education is hardly then a major vehicle for contributing towards social and economic
equality.

Jencks (1972), Oulton (1974), Hoer(1973) and Taubman and Wales (1973) also concluded
that the proportion of income inequality that could be explained by education is small,
although their rationale is very different to that offered by Bowles and Gintis.

I do not attempt to resolve the debate between the various schools of thought here. Instead,
I merely report findings for South Africa that lend some support to the Marin and
Psacharopoulos version of the human capital school.

IV. Empirical Work for South Africa

(i) Racial Inequalities

The distribution of income across the racial groups in South Africa is unequal, although this
has improved over the last two to three decades. In 1960, for example, whites constituted
around 19 per cent of the population and earned around 70 per cent of the personal disposable
income; blacks constituted nearly 70 per cent of the population but earned only 23 per cent
of the personal disposable income. By 1985, however, whites' share of income had fallen to
55 per cent, while their share of the population had fallen to around 18 per cent. Blacks'
share of disposable income had increased by about a third to around 32 per cent, and their
share of the population remained around 70 per cent3 (see Bureau for Market Research, 1986;
Official Yearbook of the Republic of South Africa, 1987-88).

It would of course be naive to assume that income differences in South Africa can be
explained only by differences in education. As can be seen from Table 6, median incomes
vary dramatically across racial groups even where there are similar levels of education. It
would be difficult to deny that earnings have in part been a function of racial group.
However, this observation need not necessarily invalidate the human capital hypothesis,
because investment in education has been different for the racial groups (recall that
government spending per black pupil at primary school is roughly one-tenth of that of whites).

If lower spending has meant lower quality education, it would be expected by the human
capital school that earnings of blacks would be lower than those of whites with similar
qualifications.

The human capital school would also expect relative earnings differentials to narrow as one
moves up the education spectrum, because differences in spending per pupil are more marked
at lower levels of education. An analysis of earnings differentials for

all racial groups for
1980 supports this conclusion. Table 7 shows that, with very few exceptions, the earnings
of non-white racial groups as a percentage of earnings of whites with the same level of
education increased with increasing levels of education. Postgraduate qualifications are
omitted because of the small sample.

Further support for this view is obtained if relative earnings differences are compared over
time. While reliable earnings data are not available for blacks for 1970, earnings as a
percentage of white earnings by level of education can be examined for coloureds and Asians
for 1970 and 1980. Since per pupil spending increased relatively for the non-white groups
from the 1960s onwards, it would be expected that relative earnings of these groups would
have increased once they entered the labour force. This is true at every level of education
for males; note also that the relative earnings disparities between those with no education
actually grew (the reader can calculate this from Table 6). While competing explanations
may be offered for the evidence presented here, it is not inconsistent with human capital
doctrine. It also offers support to the finding of Moll (1992) that improvements in the quality
of education of blacks increased returns on education of blacks between 1975 and 1985.

TABLE 6
Median Annual Real Incomes of Economically
Active Males in 1960, 1970 and 1980 by Level of
Education
(all in 1980 Rand)

	White			Coloured			Indian		Black	
Level of Education	1960	1970	1980	1960	1970	1980	1960	1970	1980	1980	
None											
1 - 7 years											
8 - 9 years											

10 years

11 - 12 years

B. Degree

M. Degree

Doctorate 2024

 3947

 5712

 6348

 7503

10943

11744

15389 2346

  5324

  6922

  8109

  9205

 15331

 17127

 21016 6775

 5798

 7210

 6332

 9280

14922

17240

18965   523

802

1468

1777

2493

6035

n/a

n/a   672

1209

2146

2529

2977

4749

4682

4828   923

1475

2299

3237

4513

8270

11432

10560   788

1198

1490

1912

2567

5297

5663

5366   1176

1691

2104

2471

2928

4718

4793

5065 2064

2255

2953

2371

4562

9406

12955

14559   866

1272

1685

1873

2230

5445

5950

6000

Source:1960 and 1970 data: Malherbe, 1977.

1980 data: Central Statistics, Unpublished Statistics.
n/a: Not available.
Comparative statistics for blacks only available for 1980.

TABLE 7
Median Annual Earnings of Coloured, Indian and Black
Economically Active Males and Females as a Percentage
of their White Counterparts by Level of Education (1980)

As Percentage of White Earnings

Level of Education	Coloureds		Asians		Blacks		
	Male	Female	Male	Female	Male	Female	
0 years							
1 - 7 years							
8 - 9 years							
10 years							
11 - 12 years							
Bachelors Degree	13.6						

25.6
31.9
51.1
48.6
55.4   10.6
39.8
41.0
49.8
62.8
78.8   30.5
38.9
41.0
37.4
49.2
63.0   35.6
89.8
47.1
47.4
55.9
89.0   12.8
21.9
23.4
29.6
24.0
36.5   8.0
27.4

Paper Presented at the Joint AARE/
NZARE Conference, Geelong, 1992
Australian Association
for Research in Education

```
    22.4
    27.2
    41.4
    58.9
```
Source:Calculated from Central Statistical Services, Unpublished Statistics
(1980).

ii)Educational Level and the Dispersion of Earnings

The relationship between education and the dispersion of earnings is
considered within each

racial group. Thereafter, this relationship is examined for blacks and
whites jointly for
specific age groups.

The measures selected to show the distribution of income are a dispersion
index (DN)4 and
a Gini coefficient. The higher the value of either measure, the worse the
degree of inequality.
Trotter's (1977) figures are used for 1960 and 1970 (Table 8), while our
own were computed
for 1980 (Table 9).

It can be observed that the dispersion of earnings generally narrowed as
level of education
increased. There are 26 possible comparisons between one educational level
and the next.
In sixteen cases, both the Gini coefficient and the dispersion index fall
as educational level
rises. In six cases, the results are ambiguous with the indexes moving in
opposite directions.
In two of these ambiguous cases, viz. that of Asians between 1 and 7 years
and 8 and 12
years of education in 1970 and 1980, the dispersion index falls
significantly whereas the Gini
coefficient increases only marginally. When skewness indexes were
calculated as well, it was
found that in both these ambiguous cases the measure of skewness fell as
educational level
rose. Perhaps there are then another two cases of declining income
inequality with increased
education. In four cases only, the dispersion indexes and Gini
coefficients both increase as
educational level rises.

TABLE 8
Characteristics of Income Distributions for Economically
Active Males by Level of Education, 1960 and 1970

Years of
Education
          Whites
    Medianb
           Coloureds
     Medianb
         Asians
    Medianb Year   R   DN   G   R   DN   G   R   DN   G0
1-7
8-12
Degree

0
1-7
8-12
Degree 1960

 1970   566
1,103
1,728
3,394

  852
1,933
2,923
5,697 2.82
 1.27

 1.05
 1.03

 3.40

1.36
1.04
1.03 0.66
0.46
0.40
0.38

0.63
0.44
0.37
0.49   147
224
427
1,740

244
439
861
d   1.41
1.93
1.74
c

1.41
1.45
1.35
d   0.45
0.51
0.46
c

0.46
0.47
0.52
d   220
335
447
1,594

427
614
868
d   2.08
1.86
1.70
c

1.53
1.32
1.26

```
    d   0.61
 0.63
 0.55
    c


 0.57
 0.49
 0.50
    d
```

Source: Trotter, 1977

b: Median Incomes in current values throughout

c: Measures cannot be calculated, as more than 20% are in last (open) class

d: Measures cannot be calculated, as more than 50% are in last (open) class

TABLE 9
Characteristics of Income Distributions for
Economically Active Males by Level of Education, 1980

Years of
education   Whites   ColouredsMedian R   DN   GMedian R
DN   G0
1-7
8-12
Degree   6775
   5798
   8877
  15363   1.75
   1.36
   1.15
   1.12   0.43
   0.41
   0.29
   0.40   923
 1475
 2751
 8454   1.44
   1.18
   1.46
   1.26   0.47
   0.46
   0.46
   0.36   Asians   Blacks0
```

1-7
8-12
Degree 2064
 2255
 3416
 9437  1.41
  1.16
  0.24
  1.23  0.42
  0.38
  0.41
  0.43  866
 1272
 1781
 5282  1.72
  1.27
  1.04
  1.28  0.44
  0.40
  0.34
  0.36

Source: Calculated from Unpublished Statistics.  Central Statistical
Services, 1980.


Table 10 shows the distribution of incomes for females in each racial group
by
educational level for 1980 (females had not been included in Trotter's
study).  There
are 12 comparisons that can be made between one educational level and the
next.
In seven cases, an increase in educational level is accompanied by a fall
in the
dispersion index and the Gini coefficient.  In two cases the results are
ambiguous


with the Gini coefficient moving in the opposite direction to the
dispersion index. In
three cases only was an increase in education accompanied by an unambiguous
worsening in the distribution of income.

An improvement in the average level of education has thus generally been
associated
with an improvement in the dispersion of earnings for both males and
females.

I obtained data also on education and income distribution for selected age
groups.
The 35 to 54 year-old groups were selected, since earnings are most stable
over these

age-groups.  I restricted the analysis here to the two polar extreme groups only (i.e.
blacks and whites) and to two levels of education where the sample was large
(completed primary education only vs completed secondary education).

Table 11  shows that the distribution of earnings for black and white males was more
unequal for those with a standard 5 education than for those with a standard 10
education:  whereas the lowest 20 percent of black and white males aged 35-44 with
a Std 5 certificate earned only 0.1 percent of all black and white male earnings with
a Std 5 certificate, the comparative figure for Std. 10 was 5.2 percent. For the top
20 percent in each educational group, the relevant percentages were 45.2 and 34.3
A similar trend is observed for those aged 45-54 - incomes were far more unequally
distributed for black and white males with a standard 5 than those with a standard
10 qualification.  The Gini coefficients for the two age groups fall from 0.41 and
0.45 for those with primary education completed to 0.28 and 0.28 for those with
completed secondary education.  Similar results were obtained for females (see
Marais, 1991).  The results are consistent with the Marin and
Psacharopoulos versionof the human capital doctrine because the
distribution of earnings for both black and
white males narrowed as educational level increased.

TABLE 10
The Distribution of Income by Level of
Education for Females (1980)


| Years of education | Whites | | | Coloureds | | |
|---|---|---|---|---|---|---|
| | Median R | DN | G | Median R | DN | G |
| None | | | | | | |
| 1-7 | | | | | | |
| 8-12 | | | | | | |
| Degree | 2978 | 1.70 | 0.90 | 1474 | | |
| | 4230 | 2.52 | 0.79 | 5583 | 0.47 | |

```
 0.48
 0.29
 0.39   317
 587
1673
4094  1.92
 2.36
 1.31
 0.74  0.48
 0.51
 0.39
 0.27                  Asians              BlacksNone
1-7
8-12
Degree 1061
 1323
 1864
 4422  1.36
 1.04
 1.32
 0.74  0.42
 0.40
 0.41


 0.32   240
 404
 497
2392  2.23
 2.25
 1.75
 0.97  0.66
 0.59
 0.45
 0.34
```

Source: Calculated from Central Statistical Services, Unpublished
Statistics, 1980.

TABLE 11
Income Distribution for Black and White Males,
Age 35-44 and 45-54 by Educational Level (1980)
Age: 35-44
Lowest2nd LowestMiddleSecond HighestHighest   20%   20%   20%   20%
20%Std. 5

```
Std. 10   0.1
   5.2      10.1
     15.0      22.3
    19.2      22.3
     26.3    45.2
   34.3
```

Age: 45-54
Lowest2nd LowestMiddleSecond HighestHighest   20%   20%   20%   20%
20%Std. 5

```
Std. 10   0.6
   5.0       8.7
    14.9      19.3
    19.7      19.7
     25.5    57.1
   34.1
```

Source: Calculated from Central Statistical Services, Unpublished
Statistics.

iii)The Distribution of Education and the Distribution of Earnings

The evidence here is more limited and somewhat less persuasive. I
considered how the

distribution of education changed between 1960 and 1980 for males for
Asians, coloureds and
whites. Table 12 shows that for coloured and Asian males, the median level
of education
improved consistently over the twenty-year period, the distribution of
education improved and
the distribution of incomes also improved.   Although the distribution of
education improved
for white males, the distribution of income worsened. (Comparable data
for blacks could not
be obtained).

For females, I had data for 1980 only for 1980, thus an inter-temporal
comparison was not
possible. However, Table 13 shows that moving from whites to Asians to
coloureds to
blacks, the average level of education fell consistently, the distribution
of education was
consistently more uneven and so was the distribution of income.

TABLE 12
Education Distribution and Income Distribution in
South Africa - Males - 1960, 1970 and 1980
                 Whites   Asians   Coloureds
196019701980196019701980196019701980Education

Median No. of years
Dispersion Index

Income
Dispersion Index
Gini Coefficient
Skewness
8.99
0.41

0.85
0.38
-0.08
9.66
0.37

1.02
0.39
0.06
10.55
0.30

1.22
0.40
0.28
6.21
0.75

1.83
0.51
-0.03
7.26
0.55

1.44
0.46
0.33
8.43
0.52

1.23
0.43
0.29
4.08

1.75

2.33
0.52
0.23
5.39
1.42

1.78
0.50
0.30
 6.49
 1.00

 0.95
 0.44
-0.21

REFERENCES

Arrow, K. (1973). "Higher education as a Filter", Journal of Public
Economics, Vol. 2,
No. 3, July.

Becker, G.S. & Chiswick, B.R. (1966). "Education and the distribution of
earnings."
American Economic Review, Papers and Proceedings, 56, May.

Blignaut, S. (1981). Statistics in Education in South Africa 1968-1979.
Johannesburg,
S.A.I.R.R.

Bowles, S. & Gintis, H. (1976). Schooling in Capitalist America, New York,
Basic
Books.

Bureau for Market Research (1986). An Assessment of the Development and
Welfare
of Employees in the Republic of South Africa, Pretoria, University of South
Africa.

Cain, G. (1976). "The Challenge of Segmented Labour Market Theories to
Orthodox
Theory: A Survey", Journal of Economic Literature, Vol. 14, No. 4.

*Central Statistical Services, (1986). South African Labour Statistics, Pretoria,
Government Printer.

*#*Central Statistical Services, (1980). Unpublished Statistics.

*Chiswick, B.R. (1974). Income Inequality: Regional Analyses Within a Human Capital
Framework, New York, NBER.

Christian, V.L. & Stroup, R.H. (1982). "The Effect of Education on Relative Earnings
of Black and White Women", Economics of Education Review, Vol. 1, No. 1.

Corke, M.A.S. (1979-80). "Educational Differentials and the Need for the Integration
of South Africa's School Systems" (unpublished paper).

Department of Statistics, (1974). RSA Statistics, Pretoria, Government Printer.

Dore, R.P. (1976). "Human Capital Theory. The Diversity of Societies and the
Problem of Quality in Education", Higher Education, Vol. 5, No. 1.

Hoerr, O.D. (1973). "Education, income and inequity in Malaysia", Economic Development and Cultural Change, January.

Jencks. C. (1972). Inequality: A Reassessment of the Effect of family and Schooling
in America, New York, Allen Lane.

Kurian, G.J. (1988). World Education Encyclopaedia, Facts and Figures Publication,

New York.

Malherbe, E.G. (1977). Education in South Africa, 1923-1975, Vol. 2, Johannesburg,
Juta and Co. Ltd.

Marais, M.A. and Fridjohn, P. (1986). "Education and the Distribution of Earnings in
South Africa", South African Journal of Education, Vol. 6, No. 3.

Marais, M.A. (1991). The Economic Benefits of Education in South Africa, Unpublished Doctoral Thesis, UNISA.

Marin, A. & Psacharopoulos, G. (1976). "Schooling and income distribution", Review
of Economics and Statistics, Vol. 58, No. 3.

Mincer, J. (1974). Schooling, Experience and Earnings, New York, National Bureau for
Economic Research.

Mingat, A. and Tan, J.P. (1985). "On Equity in Education Again", Journal of Human
Resources, Vol. 20, No. 2.

Moll, P.G. (1992). "Education and the Rise in Returns to Schooling in South Africa
1975 to 1985", Economics of Education Review, Vol. 11, No. 1.

Official Yearbook of the Republic of South Africa 1987 - 88, Johannesburg, Perskor.

Oulton, N. (1974). "The distribution of education and the distribution of income",
Economica, Vol. 41, No. 164.

Sahota, G.S. (1978). "Theories of Personal Income Distribution: A Survey", Journal of
Economic Literature, Vol. 16.

Taubman and Wales. (1973). "Higher Education, Mental Ability and Screening", Journal
of Political Economy, Vol. 18, No. 1.

Thurow, L.C. (1972). "Education and Economic Equality", The Public Interest, Summer.

Trotter, G.J. (1976). "The Rationale for Education Planning", in South Africa Journal
of Economics, Vol. 44, No. 4.

Trotter, G.J. (1977). "Education and income distribution", South African Journal of
Economics, Vol. 45, No. 4.

Trotter, G.J. (1988). The Social Costs of South African Education, Durban, Urban
Foundation.

UNESCO. (1988). Statistical Yearbook, Paris, UNESCO.

World Bank. (1988). Comparative Education Indicators, Washington, The World Bank.