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RACE DIFFERENCES IN INCOME

Albert Wohlstetter and Sinclair Coleman

A Report prepared for
OFFICE OF ECONOMIC OPPORTUNITY

Rand
SANTA MONICA, CA 90406

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PREFACE

This study estimates the extent and some of the components of race differences in income along the entire income distribution, and investigates also changes in these differences since 1939; it examines briefly theories proposed to account for these differences; and, finally, it deals with the relation between the objective of reducing race differences in income and other aims of policy. It is one of several studies for the Office of Economic Opportunity (under Contract B-99-4944) that look at obstacles to disadvantaged workers in U.S. job markets.

For their help in obtaining data, we are very grateful to Fred Hoffman, formerly of the Bureau of the Budget and now an independent consulting economist; Harold Goldstein of the Bureau of Labor Statistics; Frank Lewis, formerly of the Bureau of the Budget and at present with the Department of Labor; Herman P. Miller of the Bureau of the Census; Dorothy K. Newman, formerly of the Bureau of Labor Statistics and now with the Urban League. We also want to thank the many readers of an earlier draft of the manuscript who responded with helpful critical comments. Among these are D. Gale Johnson and Duncan MacRae of the University of Chicago; Geoffrey Moore, Commissioner of Labor Statistics and Robert L. Stein of the Bureau of Labor Statistics; Kenneth Arrow of Harvard University; and Stephen J. Carroll, Robert A. Levine, John McCall, Carl Morris, Joseph Newhouse, Anthony Pascal, T. Paul Schultz, and Frank Sloan of Rand.

Finally, we are indebted to previous work in the field of discrimination, especially that of Gary Becker, Anne Krueger, James Tobin and Finis Welch.

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CONTENTS

PREFACE.	iii
LIST OF FIGURES.	vii
LIST OF TABLES	ix
Section	
I. INTRODUCTION.	1
Recent Views.	1
What This Part of Our Study Does.	5
Qualifications.	7
II. CURRENT INCOME: 1966 and 1967.	10
Averages.	10
Distributions	11
The Ends of the Distribution.	17
Patterns of the Income Ratio Curves	17
The Meaning of "Equal Opportunity".	18
Income Comparisons for Men and Women.	21
Regional and Farm-Nonfarm Comparisons	24
III. CHANGES OVER TIME	27
Cyclical Instability of Nonwhite Relative Income.	27
Relative Nonwhite and White Distributional Changes in Total Money Income.	34
Relative Distributional Changes Since 1939 in Wages and Salaries.	40
Changes Since 1967.	42
Why Do These Results Differ from Some of the More Common Statements?.	44
Relative Improvement has Clearly Taken Place...	56
...But We are Still Far from Closing the Income Gap	57
IV. SOME COMPONENTS OF THE INCOME DISPARITIES	59
Age Structure	59
Present and Past Discrimination, Genetics, and So On. . . .	64
Occupational Distributions.	70
The Effects of Improving the Job Distribution of Non- white Men	73
The Effects of Improving the Job Distribution of Nonwhite Women.	75
The Distribution of Schooling	78
Marginal Returns to Schooling for Whites and Nonwhites. . .	79
The Effects of Relative Increases in Years of Schooling for Nonwhite Men.	86
The Effects of Relative Increase in Years of Schooling for Nonwhite Women.	89
Concluding Comments on Schooling and Jobs and the Income Ratios at Higher Quantiles.	92

V. SUMMARY AND CONCLUSIONS	99
REFERENCES	105

LIST OF FIGURES

1. Distribution of Total Money Income to Families, 1967.	12
2. Distribution of Total Money Income to Persons, 1967 - Both Sexes.	14
3. Ratio-at-Quantiles for Families (1967).	15
4. Ratios-at-Quantiles for Persons (1967).	16
5. Distribution of Total Money Income of Persons, 1966 -- Male .	20
6. Distribution of Total Money Income of Persons, 1966 -- Male and Female.	22
7. Distribution of Family Income, South and Non-South, 1967. . .	25
8. Annual Growth Rates in Median Family Income 1947-1967	28
9. Total and Subperiod Growth Rates in Median Income	29
10. Annual Growth Rates for Median Income of Persons 1948-1967. .	31
11. Income Distribution of Aggregate Persons: 1967 and 1949. . .	35
12. Ratio-at-Quantiles Comparison for Persons, 1949 and 1967. . .	36
13. Aggregate Persons -- Differences in Ratios of Nonwhite to White Income at Selected Percentiles: 1949 to 1967	38
14. Ratio-at-Quantiles Comparison for Families, 1947 and 1967 . .	39
15. Ratios of Income to Persons at Selected Percentiles of the Income Distribution, 1966, 1949 and 1959.	41
16. Ratios of Wage and Salary Income of All Wage and Salary Workers and of Year-Round Full-Time Workers: 1939 and 1967	43
17. Ratios of Income at Selected Percentiles of the Income Distribution for Males, 1949, 1959 and 1966	45
18. Ratio-at-Quantiles Comparison for Families, 1945 and 1952 . .	47
19. Illustrations for Case where the White Minus Nonwhite Income Differences (or for Log Scale the Nonwhite-to-White Income Ratios) are the Same for All Quantiles.	52
20. Relative Male Income in 1967 Adjusted for Age	61
21. Changes Over Time in Age Adjusted Relative Income for Men in 1949 and 1967.	63
22. Earnings for Males in 1967, with Adjustment for (10-Class) Occupational Categories	74
23. Earnings for Females in 1967, with Adjustment for (7-Class) Occupational Categories	77
24. Total Money Income to Males 25 and Over in 1967, with Adjustment for Years of Schooling Completed	87
25. Total Money Income to Females 25 and Over in 1967, with Adjustment for Years of Schooling Completed	91

LIST OF TABLES

1. Earnings for Males Who had Earnings, 1967, by Occupation Group of Longest Job.	72
2. Earnings for Females Who had Earnings, 1967, by Occupation Group of Longest Job.	76
3. Males 25 and Over, 1967, by Years of Schooling.	85
4. Females 25 and Over, 1967, by Years of Schooling.	90

I. INTRODUCTION

This report summarizes findings from an analysis of income disparities between whites and nonwhites* in the United States. It deals with present and past relative money income of whites and nonwhites at various points in the distribution of each. The empirical results are themselves of interest. They contradict many of the most familiar statements of the last few years on these subjects, in particular statements about the low and high ends of the nonwhite and white income distributions and their changes. Further, they provide a concrete context for clarifying and illustrating the meanings of some related but distinct goals in an area of urgent policy concern. These goals are frequently confused. Yet programs directed to one of these ends may do little or nothing to achieve another. Clarification here, then, can have a pragmatic value.

Section II treats current income disparities; Section III, changes over time. Section IV has to do with three major components of the income disparities: differences in age structure, years of schooling, and job distribution.

RECENT VIEWS

Some useful empirical studies have been done of relations between white and nonwhite income and some suggestive theoretical models of discrimination proposed. We have benefited from them. Nonetheless, not only the popular, but also the professional literature abounds in statements about the relations of nonwhite and white income distributions and their

* For the most part we have used annual data for whites and nonwhites since these are available since the 1940s. For purposes of the Census, the nonwhite population is primarily the black population (over 90 percent). Other nonwhites are mainly Orientals and American Indians. Orientals receive more and Indians less income than blacks. Both an upward and a downward bias then affect inferences from white-nonwhite income disparities to white-black differences. The biases do not substantially affect the largest aggregates but are important, for example, in regional comparisons: Orientals and Indians make up nearly half the nonwhites in the West, while in the South almost all nonwhites are black.

changes over time that do not seem to square with our own results (as summarized in Part V). Sometimes the contradiction is only apparent, but more frequently it is genuine. It is sometimes said, for example, that the income gap between the races is greatest at the lowest levels of the income distribution. And there has been up until very recently a rather widespread impression of decline or stagnation, especially at the bottom. Such impressions have been common not only among militants but among moderate civil rights advocates, and not only among polemicists and politicians in ephemeral pamphlets, they occur rather often in the writings of able economists and sociologists in the course of serious (and generally illuminating) studies. The following quotations are more or less typical:*

Current Race Differences Smallest at Top of the Distribution

"The degree of inequality of incomes of whites and nonwhites is related to position in the relative income distribution. Inequality is less at higher levels of the income distribution than at lower levels."

Guthrie, 1969

Inequality Among Nonwhites Increasing More than Inequality Among Whites

"The reality seems to be that some Negroes, especially those in the middle and upper income brackets, are gaining rapidly on whites, while others, particularly those in the slums, are losing ground in relative terms...."

Faltermayer, 1968

"...in terms of employment and income and occupational status it is quite possible the Negro community is moving in two directions, or rather that two Negro communities are moving in opposite ones. Obviously such a development would be concealed -- cancelled out -- in aggregate statistics that list all 'nonwhites' together."

Moynihan, 1967

Absolute Decline

"the economic position of the Northern Negro deteriorates rapidly...."

Bayard Rustin, 1966

*For full citations, see bibliography.

"It is a stark reality that the black communities are becoming more and more economically depressed."

Carmichael and Hamilton, 1967

"...there has been almost no change or change for the worse in the daily lives of most blacks."

Martin Duberman, 1968

"Although it is true that the income of middle-class Negroes has risen somewhat, the income of the great mass of Negroes is declining."

Whitney Young, Jr., 1968

Absolute Stagnation of Lowest Fifth

In talking about the period 1947-1966, the Kerner Report says, "About two-thirds of the lowest income group -- or 20 percent of all Negroes -- are making no significant economic gains despite continued general prosperity."

Kerner Report, 1968

Widening Gap Between White and Nonwhite or Lower Nonwhite to White Ratios

Title of an article comparing 1949 and 1959 incomes, "Decline in the Relative Income of Negro Men."

Batchelder, 1964

"The income gap between this country's whites and nonwhites is wide and getting wider."

McGraw-Hill's special report #2005,
1968

The Kerner Commission phrases its main comprehensive comparison between Negro (actually nonwhite) family income and white, "...Although it is growing, Negro family income is not keeping pace with white family income growth. In constant 1965 dollars, median nonwhite income in 1947 was \$2,174 lower than median white income. By 1966, the gap had grown to \$3,036."

Kerner Report, 1968

Not Closing, Stable Ratio

"[It is] startling...that there has been very little change in the ratio of nonwhite family income to white family income over the last decade and a half."

Rashi Fein, 1967

"Nor has discrimination declined. The average Negro family income has consistently remained near 55 percent of the white income. For a given average income level the white and black distributions have similar shapes, but the Negro distribution lags approximately thirty years behind the white. On the basis of relative measures such as these, discrimination has neither declined nor increased. In absolute terms, however, between 1947 and 1967 the average income gap between white and Negro families widened from \$2,300 to \$3,100 (in 1967 dollars). Relative measures indicate a stable pattern of discrimination, absolute measures a more intense pattern."

Thurow, 1969

"Negro incomes are growing as fast as white, but while Negroes are increasingly well-off absolutely, the gap remains nearly constant in relative terms."

Banfield, 1970

"...while the absolute condition of the Negro has improved markedly in the last decade, his relative position has improved barely perceptibly...."

John Kain, 1969

Increase or No Decline after World War II, then Decline after Korea

[There was a]..."failure of the economy in the second postwar decade to match its performance in the first."

James Tobin, 1967

"...[the Negroes] maintained their wartime gains in the immediate postwar period...." "The Korean War prosperity... represented the apex of Negro prosperity, at least relative to white prosperity."

Arthur M. Ross, 1967

Not all of these views are based on studies and some of the studies have been affected by rather severe limitations. For the most part:

1. Even where these writers talk of income distributions or make inferences that depend on the distributions, they have actually compared only medians or means; or where they have used distributions they have selected only a few points or used summary statistics (such as the Gini coefficient) that essentially enable comparisons only of inequality among nonwhites with inequality among whites, which is not the same as comparing inequalities in income between nonwhites and whites.

2. They have focused on one or a few income series -- for example, family income or male income -- and have sometimes drawn invalid inferences from these magnitudes to others -- for example, total money income to persons.

3. They have sometimes drawn conclusions about personal income that really apply only to places or to job categories -- conclusions that do not apply to net figures covering both the starting and end points of migrations from one place or occupational category to another.

4. In estimating changes over time they have sometimes used rather short time spans, or pairs of years sharply affected by the cyclical variability of nonwhite absolute and relative income.

5. Some inferences that depend implicitly on assumptions about trends have been based on cross-sectional analysis at an arbitrary point of a cycle -- a point poorly located to sustain such inferences.

6. For very early periods before income data by color are available, changes in nonwhite to white income ratios have been estimated by very coarse occupational indices that neglect nonwhite-to-white real income changes within occupations. This is sometimes done by analogy with production indices where prices are held constant; but in the present case changes in real income are a product of changes in occupational distribution and in real income within occupations. This second factor in the product has been ignored in these studies.

7. They have sometimes used absolute dollar differences to draw welfare conclusions more appropriately based on percentages or logarithms.

8. They have ignored sampling errors, even though these can be estimated from much of the data and are relevant for inference.

WHAT THIS PART OF OUR STUDY DOES

The part of our study summarized here has:

1. Compared white and nonwhite income along the entire distribution of each and developed several statistical measures and graphic devices for this purpose.

2. Used data, including unpublished data from the Current Population Surveys, to construct distributions of wage and salary income, of total money income to families and total money income to persons 14 years old and over, with several socioeconomic breakdowns of each; extended the personal-earnings and family income series of distributions back to 1945, and the wage and salary distributions to 1939; extended the continuous series of income to persons 14 years and over from 1953 back to 1948.

3. Systematically used data on sampling errors varying for different points on a given distribution and at different calendar dates to estimate errors in our income ratios and in various functions of them. These error estimates permit inference about the probable longitudinal and cross-sectional relations of various distributions.

4. Estimated the effects on nonwhite relative income of differences in the distribution of whites and nonwhites by age, years of schooling, and major occupational categories.

5. In the course of this work, explored briefly the relations to the data of various economic theories of discrimination in the marketplace, genetic explanations of income differences between whites and nonwhites, queuing models of the relative instability of nonwhite and white income during the business cycle, human capital theories of formal schooling and on-the-job-training as an investment process, a model of the dynamics of relative improvement in terms of migrations from one place, job category, or industry to a higher income place, job category, or industry (in which the movers come from the top half of the distribution at the point of origin but, to begin with, are in the lower half of the distribution at the point of destination).

Other parts of this study completed or in process but not summarized here:

6. Use unpublished Current Population Survey or Survey of Economic Opportunity data tapes to estimate the joint effects of various components of the disparity.

7. Analyze the effects of redistributing nonwhites among detailed occupations.

8. Use a new, generally useful, and powerful statistical measure of the relative internal inequality of two distributions to compare inequalities among nonwhites with inequalities among whites, and to estimate changes over time in such internal inequalities. (The measure used to compare inequalities within groups is a parameter of the same ratio-at-quantiles function useful for comparing inequalities between the groups.)

9. Analyze and illustrate the relations and the differences among programs to reduce unemployment or to eliminate poverty or to reduce internal inequalities in society as a whole on the one hand and, on the other, programs addressed to the problem of eliminating inequalities of opportunity and income disparities between whites and the nonwhite races.

10. Explore various political and sociological theories of relative deprivation and discontent.

QUALIFICATIONS

Several disclaimers are in order. Although our study has been almost entirely concerned with income, this does not imply that we believe income disparities are the only important problem of race discrimination; nor that the only such problems of importance are economic; nor even that they are all quantifiable. But clearly a broad range of social, political, and economic problems is reflected in income disparities, and income data are among the most complete and tractable of the available quantitative measures. Moreover, income is important. Among other things, nonwhites do want more income, and more income relative to whites.

Our primary data source has been the Current Population Survey (CPS), a monthly survey conducted by the Bureau of the Census. The CPS tabulations, currently based on a stratified sample of about 50,000 households, contain the most complete figures currently

available. However, some qualifications regarding these data are still in order. First, there is the problem of under-reporting; whites have more of a principal kind of income that is under-reported -- self-employment income. On the other hand, some hold that nonwhite income is under-reported because more nonwhites, especially men, are missed by census interviewers. Then there is the problem of price differences in and out of the ghetto: these seem to favor whites, but there are no reliable estimates of the magnitudes of these differences. The partial exclusion of members of the armed forces introduces another unknown bias. We have considered at least in a gross way a variety of other possible sources of error (variation in access to public services, differences in imputed income from property, differing family structure and dependency ratios, differing age distributions of nonwhites and whites, the relative instability of nonwhite income, and, since the data used are money income before taxes, possible differences in effective taxes). On the whole, a rough evaluation suggests that the data understate the current nonwhite relative disadvantage; and also appear to understate the relative improvements over time. Inevitably, however, there are substantial uncertainties. These are problems that are introduced by the income data, and inferences about income inequality have to be so qualified.

There are three main income concepts used in the CPS tabulations: (1) wage and salary income, (2) earnings, and (3) total money income. Wage and salary income includes the income of employees, that is, regular pay, bonuses, tips, commissions, and so on. Earnings include wage and salary income plus self-employment income. Finally, total money income includes earnings plus rental income, interest, dividends, and transfer payments of all sorts such as welfare, social security, alimony, and others. We have dealt primarily with total money income in our study, since this is probably the best readily measurable income indicator of one's command over goods and services. Other types of income are important for certain classes of questions regarding racial income differences, but except where otherwise indicated, all of the references to income in this report mean total money income.

We shall refer mainly to two sorts of income receiving units: families on the one hand, and persons on the other. Income to families^{*} is of substantial interest in considerations of welfare and consumer behavior. It has, however, a good many limitations, especially for comparing race differences. Family units at any given time vary greatly in the number of persons that compose them, in number of earners, and in the amount of doubling up (the combination of young married couples or of the elderly with family heads in the prime of life). Moreover, family structures vary as between nonwhites and whites. Family structures also vary over time for both nonwhites and whites. And these changes over time have differed as between nonwhites and whites. For example, though white women participate less in the labor force, since World War II they have increased their participation more than nonwhites. For such reasons it is important to deal not only with families as receiving units, but also with persons.^{**}

^{*}The term "family" as used here refers to a group of two or more persons related by blood, marriage, adoption, or residing together.

^{**}See T. P. Schultz, 1965, p. 7, which stresses the variable size, structure, and wants of the family unit and therefore the greater ambiguity of family income data compared with data on personal income.

II. CURRENT INCOME: 1966 AND 1967

When we speak of current incomes, we mean mainly 1966 and 1967, sometimes 1968 and 1969, and never 1970. There is an inevitable long lag between the receipt of income in a given year, a report on it in the sample survey the following March, and the processing of the Survey data and further analysis and publication. Similar data and publication lags in the past partly explain the disparity between what a good many authors have been saying about "current" nonwhite and white income and the greatly changed actual income at the time of saying. It is a hazard of the profession that should inspire a prudent check with more recent indirect measures as well as cycles and trends.

The upshot of an analysis of the 1966, 1967, and 1968 data is that there are very large disparities between nonwhite and white family income, and between the incomes of nonwhite and white persons 14 years old and over who have income. These disparities appear on the whole to be understated by the data, though they are the most complete figures currently available. Moreover, the disparities affect not only the middle and the lower end but the entire income distribution. Drastic reduction in such differences requires work not only on the nonwhite poor, or on reducing "inequalities" in general, or on the "hard core" unemployed but large changes in the occupational distribution of nonwhites, and in the nonwhite to white ratio of earnings within occupations. It will take time, energy, resources, and intelligence.

AVERAGES

In looking at current differences in income between whites and nonwhites, we will look first at averages. Median family income for nonwhites in 1966 was \$4,628 and for white families \$7,722, giving a nonwhite to white median income ratio of 59.9 percent. Median total money income to nonwhite persons (including all persons 14 years old and over who received income) in 1966 was \$2,099 and for white persons \$3,499, giving a nonwhite to white ratio of 60.0 percent.

The ratios improve slightly for both persons and families in 1967. For families, median nonwhite income was \$5,141 and median white income was \$8,274, for a ratio of 62.1 percent. For persons, median nonwhite income was \$2,322 and for whites \$3,725, giving a ratio of 62.3 percent. Data for 1968 indicate that the ratios at the median for both families and persons were about the same as in 1967.

DISTRIBUTIONS

However, we are interested not only in comparing white and non-white incomes in the center of the distributions, but at all other parts of the income distribution as well. The statements cited earlier, for example, include some that say that at any given time the ratio of nonwhite to white income is lower in the low-income quantiles than it is at the high end -- that nonwhite relative income increases with increasing quantiles of income; that inequality among nonwhites is greater than among whites and, moreover, is increasing; that ghetto rioters are particularly sensitive to where they stand in relation to other Negroes, not to whites, and believe that inequality among nonwhites is increasing;* that better-educated Negroes compare themselves with whites of equal schooling, and therefore feel more deprived than uneducated Negroes. (The latter on this assumption, contrary to the preceding case, are supposed to compare themselves with whites who are not much better off than they.)

Such statements manifest a variety of interests and beliefs about the distributions of nonwhite income. To compare the distribution of income to whites with the distribution of income to nonwhites, we use several methods. One is illustrated in Fig. 1. Here we have white and nonwhite incomes for families in 1967 plotted against proportions of the population. The rightmost vertical scale gives us the proportion of families with income greater than the amount shown, and the leftmost vertical scale gives us the quantiles -- the proportion of families with income equal to or less than the amount shown. Incomes are plotted on the horizontal scale. For example, in Fig. 1 the incomes

* Caplan and Paige, 1968.

Fig. 1 — Distribution of total money income to families, 1967

at the 33rd percentile are about \$3,500 and \$6,500 for nonwhites and whites respectively. Since the income scale is logarithmic, equal distances on the graph between white and nonwhite incomes indicate incomes in equal ratios.*

From Fig. 1, it is clear that income differences between whites and nonwhites involve differences not only in median incomes or in the proportions in poverty, but in the entire distribution. This illustrates the need to distinguish objectives. Reducing the number of poor -- as defined by an arbitrary poverty line -- doesn't help nonwhites above that line, but of course most nonwhites above the line are closer to it than whites and they receive smaller incomes than whites in corresponding positions of the income distribution. Fig. 2 gives us a similar picture of income to persons in 1967. Again, as in the case of families, income differences exist at all points of the income distribution.

For a considerable part of the distribution of family income in the modal range, the distance between the two curves narrows with increasing levels of income -- that is, the nonwhite to white ratio tends to increase. All of this behavior is more clearly visible in the income-ratio-at-quantiles curve shown in Fig. 3 which is derived by taking the nonwhite-to-white income ratio at selected percentiles and plotting the ratio against the percentiles. However, these changes are not monotonic and their behavior at the tails in particular is quite different. For 1967, for example, in the lowest and highest fifths, the ratios decline with increasing income. Moreover, for the case of income to persons, for the distribution on the whole, there is no tendency toward increased ratios with increasing income such as is shown in the modal range of family income; and the relative decline in the bottom and top percentiles is plain. See Fig. 4. (We shall make extensive use of similar curves.)

*For some of the reasons for our extensive use of logarithms, percentage differences and the like, see pages 48 ff.

Fig. 2—Distribution of total money income to persons, 1967 - both sexes

Fig. 3 — Ratio-at-quantiles for families (1967)
(95% confidence limits)

Fig. 4 — Ratios - at - quantiles for persons (1967)
(95% confidence limits)

THE ENDS OF THE DISTRIBUTION

There are good reasons to expect the two ends of these relative distributions to behave differently from the middle. At the bottom, income maintenance programs, in spite of their many familiar limitations, tend to put at least a low floor under nonwhite as well as white income and so to raise low level nonwhite relative to low level white income. Moreover, the lower the position in the nonwhite income distribution the more one would expect these income supports to decrease nonwhite economic disadvantage relative to whites at the corresponding position in the white distribution. This effect would be even stronger with more generous income maintenance programs, but they are quite visible with current ones.

At the other end, nonwhites run into a variety of obstacles lost from view in averages and totals. Even though young whites and nonwhites have come close together in median years of schooling, they are still very far apart in the advanced education associated with high income. In the older groups the schooling differences are larger. Moreover, even allowing for differences in years of schooling and in occupational structure, many social hurdles apparently make it particularly hard for nonwhites to earn very high incomes; examples include the remoteness of nonwhites from top-level communication and decision networks, a particular white prejudice against nonwhites in supervisory and other authoritative roles.* Such expectations about the two ends of the distribution are confirmed by the analyses (summarized below, see Sections III and IV) of the changes over time in money income distributions and their components and by the analysis of the effects of schooling and occupational distributions.

PATTERNS OF THE INCOME RATIO CURVES

In fact, the behavior of the income-ratio-at-quantiles curves exhibit quite consistent patterns in recent years. The 1967 curve (Fig. 3) is quite typical for families. It is neither linear nor

* Blumer, 1961, p. 219; Siegel, 1965, pp. 41-57.

monotonic. It does appear that there are three distinct segments of the curve, each of which may be approximately linear. Fitting straight lines to each of the three segments (that is, 0th to 21st percentile, 21st to 83rd percentile, and 83rd to 100th percentile) gives strong evidence that these three parts of the distribution follow quite different patterns. The slopes for the nonwhite-to-white income ratios against quantiles of the distribution are negative for the two end segments, and positive for the middle one. (The positive slope for families in the modal range appears to be associated with a greater tendency in nonwhite middle income families for wives to work as well as husbands; and perhaps with the positive association of wives' job qualifications with husbands'.) The data points are also very close to linear over the middle segment.* In Fig. 4, the segments of the relative distribution for persons (using 0th to 38th percentiles, 38th to 79th percentiles, and 79th to 100th percentiles) are not as clearly linear as for families, but the change in behavior of the curve is quite pronounced over these three parts of the distribution. And the evidence is particularly strong for a negative slope in the last segment (the upper part of the distribution).**

THE MEANING OF "EQUAL OPPORTUNITY"

The relevance of the low end of the distribution is clear, but why should anyone bother with higher percentiles, especially the top

* Let X =quantiles of the distribution, and Y =the nonwhite-to-white income ratio for families. Then the straight line fits are $Y = .599 - .376X$ for $0 < X < .209$ with $R^2 = .826$, $Y = .441 + .336X$ for $.209 < X < .826$ with $R^2 = .991$, $Y = 1.182 - .565X$ for $.826 < X < 1$ with $R^2 = .829$. The slopes for all three fits are significantly different at the 5 percent level from the slope of .1567 which results from fitting a line to the whole distribution. All three fits took account of the sampling errors for each point; i.e., each point had a weight inversely proportional to the variance in the estimate at that point.

** Let X =quantiles of the distribution, and Y =the nonwhite-to-white income ratio for persons. Then the straight line fits are $Y = .832 - .530X$ for $0 < X < .382$ with $R^2 = .971$, $Y = .580 + .085X$ for $.382 < X < .787$ with $R^2 = .503$, and $Y = 1.116 - .560X$ for $.787 < X < 1$ with $R^2 = .808$. All three slopes are significantly different at the 5 percent level from the slope of -.1379 which results from fitting a straight line to the whole distribution, and the last slope is significantly below zero at the 5 percent level. All three fits took account of the sampling errors for each point; i.e., each point had a weight inversely proportional to the variance in the estimate at that point.

ones? There are good reasons for wanting to put the same floor under the income of nonwhites and whites. But to focus only on the lowest quantiles is to neglect the fact that there is a lower statistical ceiling over nonwhite income, one that is hard to penetrate. It may suggest a kind of settlement-house attitude, as distinct from the wider range of concerns indicated by the goal of equal opportunity. First, it should be observed that even the top 1 percent of nonwhite income receivers are hardly rich beyond the wildest dreams of avarice. The top 1 percent of nonwhite males who had income in 1966 received at least \$12,000 (see Fig. 5). However, the top 10 percent of white males received at least \$12,000,* and the top 1 percent of white males received at least \$26,000. It seems only reasonable for nonwhites to want to have as much of a chance as whites to get \$12,000 in annual income, or \$26,000. This seems a natural interpretation of the phrase, "equality of opportunity." The phrase clearly covers an equal chance to exceed the poverty line, but getting an even chance with whites at middle and higher incomes seems to be implied as well. More than just the symbolism of top nonwhite earners (like top athletes or top politicians), it may provide useful incentives for those in lower ordinal groups to aim that high: even if they don't reach top income levels, they may get more than if they hadn't had that incentive. Finally, the growth of the nonwhite middle class and of a class of high-level managers, professionals, or entrepreneurs who make, say, \$26,000 or

* Forming the nonwhite to white ratio of these proportions with income above \$12,000, that is, 1 percent/10 percent, as a measure of nonwhite disadvantage at that income level has an obvious intuitive appeal. The variation of such ratios with increasing income levels at a given date and the variation over time of such ratios above a given dollar income level have both been suggested to us as useful measures of changing nonwhite disadvantage. In fact, in 1967 nonwhite relative proportions with income above various dollar amounts declined linearly with income from .963 at \$500 to .233 at \$10,000, suggesting a steady and drastic worsening of nonwhite relative disadvantage with higher income levels. The regression, moreover, was statistically significant at the .001 level. But its substantive significance is slender. The ratios below various dollar levels suggest the opposite: a steady relative improvement with increasing income. Something like this measure is rather popular for indicating changes over time and is equally misleading for this purpose. We comment on it in Section III.

Fig. 5 — Distribution of total money income of persons, 1966 — male

more might be directly associated with the economic improvement of other nonwhites -- through savings and investment, by helping to build information networks, and through key positions of influence that affect entry, promotion, and profit in higher-paying occupations.

Of course, none of the above disparages the importance of lifting the low end of the nonwhite distribution. Rather, it stresses that the problems of discrimination apply to all of the distribution; that some useful aids to solving the troubles at the low end are not independent of progress at the middle and at the top; and finally, that slogans of "equal economic opportunity," if they mean what they say, imply for nonwhites an even chance with whites -- not simply at scraping by above some arbitrary minimum, but at doing moderately well, and a fair chance at making it big.

INCOME COMPARISONS FOR MEN AND WOMEN

The greater disparity between whites and nonwhites for men (Fig. 5) than for aggregate persons (Fig. 2) implies that the disparity may be smaller between white and nonwhite women. The income distributions for white and nonwhite women are illustrated in Fig. 6, along with the distributions for men. Here we see that income to both white and nonwhite women is lower than income to either white or nonwhite men. Note also that the two curves for women are closer to each other than are the two curves for men, which means nonwhite to white income ratios are higher for women than for men. Thus, among nonwhites, men have higher incomes than women, but the difference is smaller than that between white men and women.

Men are, of course, the principal breadwinners and for that reason the object of more study; and the "status" of women on the other hand is often thought to be primarily determined by the income, occupation, and education of their husbands. It is also true that more data are published about men than women and this tends to further focus research on male income. This in turn is reinforced by several traditions of research. For example, S. M. Lipset has suggested to us that the familiar sociologists' methods of studying occupational mobility

Fig. 6 — Distribution of total money income of persons, 1966 — male and female

by relating the occupational status of the son to occupation of the father is of clear interest for men, but has no ready correlative for women. Be that as it may, many studies focus exclusively on comparisons of white and nonwhite men, yet sometimes draw conclusions about nonwhites in general. However, from Fig. 6 we can see that men and women have quite different incomes, and any inference from one to the sum of the two (or in the reverse direction) requires caution. This caution has not always been observed, and it has misled inferences about changes over time.

Nor is it justified, in spite of the principal importance for family welfare of male income, to focus only on male income and to neglect the incomes of white and nonwhite women. This might be done on the premise that, in the case of white women, low incomes are almost entirely a matter of unconstrained choice, that white women who participate less or receive smaller rewards in the labor force do so only because they are married to rich men and are not interested in middle or high level jobs. However, that premise may be doubted even by some who are not charter members of Women's Lib. First, for nonwhite compared with white women, the ratio of the medians of year-round full-time earnings is even larger than that for all earnings, part and full-time (in 1967, .761 compared with .688; see Table 2). Second, even when the husband's income is high, nonwhite wives participate more than whites. "Among families where the husband's yearly income was \$10,000 or more, about half of the Negro wives compared with a third of the white wives were working or looking for work"* in March 1969. Since the interval is not bounded above and nonwhite husbands are undoubtedly clustered nearer the lower limit, this second point is suggestive rather than conclusive. Third, however, the income contribution of wives, in any case, bears no simple inverse relation to the income of their husbands. For nonwhites in the middle ranges, as we suggested earlier (p. 18), wives' incomes are positively correlated with their husbands' income. And, finally the willingness to work of white as well as nonwhite women has something to do not only with pay, but also with the non-monetary rewards of the work available --

*Waldman, 1970, p. 12.

its interest, the status it confers, and so on. An abundance of evidence suggests that (in parallel as we shall observe with nonwhite minorities) women find it especially hard to get authoritative, high-paying jobs that call for high levels of education. See Archibald, 1970.

Both nonwhite and white women are discriminated against, though discrimination by reason of sex is even harder to disentangle and quantify than color discrimination. One needs to separate not only unequal pay for equal work from non-market discrimination in the opportunities to acquire skills, but also inequalities in opportunity available to women who want to and can perform the same job as well as men from educational choices and income differences due to differing social functions, capabilities, and preferences. The annals of prosecution under the Fair Labor Standards Acts, as well as common observation, make clear that some substantial part of the difference is discriminatory.

REGIONAL AND FARM-NONFARM COMPARISONS

There are various ways of decomposing income distributions other than by sex. For example, for families we can look at income differences over different regions of the country or by farm-nonfarm residence. Fig. 7 compares the ratio-at-quantiles curves for the South^{*} and for the Nonsouth for 1967. For both whites and nonwhites incomes are lower in the South than in the rest of the country. However, notice that the difference is greater for nonwhites than for whites. Thus, Southern nonwhites have lower incomes relative to Southern whites than have nonwhites living outside the South compared with whites outside the South. This greater income disparity in the South is very important for the overall picture, because at present about half of all nonwhite families live in the South, whereas only about one-quarter of white families do.

We find even greater disparities between white and nonwhite incomes for families who live on farms. However, the effect on the

^{*}The South as used here includes, besides the District of Columbia, 16 states: Maryland, Delaware, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Arkansas, Oklahoma, and Texas.

Fig. 7 — Distribution of family income, South and non-South, 1967

overall income distribution is small, since only a small proportion of /families live on farms, and today proportionately fewer nonwhites than whites. In 1967 about 5.5 percent of white families lived on farms, while about 4.4 percent of nonwhite families did.

The intersection of some of these unfavored categories show even larger contrasts in nonwhite to white ratios.

III. CHANGES OVER TIME

General impressions of decline or stagnation of nonwhite income relative to white income vary in meaning from nonwhite absolute decline from a previous nonwhite position to the view that the growth rates of nonwhite income have been positive but no larger than for whites.

CYCLICAL INSTABILITY OF NONWHITE RELATIVE INCOME

The graph in Fig. 8 shows us the year-to-year percentage changes in both white and nonwhite median family income from 1947 to 1967 (in 1966 prices). The percentage changes for the entire 20-year period and for three sub-periods are illustrated in Fig. 9(a). From Figs. 8 and 9(a) several points can be made. First, the annual average percentage improvement in nonwhite family median income, adjusted for price changes, has been greater than that for white families: 3.8 percent and 2.8 percent respectively. Second, the fluctuations in both the sub-period trends and in the year-to-year changes are greater for nonwhites than for whites. These relatively larger nonwhite rises and falls in income appear to reflect changes in the tightness of the labor market and roughly to parallel business cycle expansions and contractions.* The greater cyclical instability of nonwhite income is related to the fact that during the business cycle, in general, wages fluctuate most, the general run of salaries less, and professional and executive salaries least,** and nonwhite income has a disproportionately large share of some of the sorts of earnings that fluctuate most widely. The relatively larger short-term fluctuations of nonwhite income also offer a certain amount of support for some variants of a queuing model for nonwhite earnings. If (in Gary Becker's terms) employers' prejudices

*The business cycle peaks and troughs as set by the National Bureau of Economic Research for the period are: peak November 1948, trough October 1949, peak July 1953, trough August 1954, peak July 1957, trough April 1958, peak May 1960, trough February 1961. See Moore and Shiskin, 1967, p. 25. The income figures are, of course, annual totals and therefore tend to hide or distort short-term fluctuations that peak at various other times of the year.

**Creamer, 1956.

Fig. 8—Annual growth rates in median family income 1947-1967
(1966 prices)

A—Families 1947-1967

B—Persons 1948-1967

Fig. 9—Total and subperiod growth rates in median income (1966 prices)

are measured by a discrimination coefficient that in effect makes employers act as if the real costs of hiring or promoting a Negro exceed the money costs by some percentage, then the scarcity and the rising costs of white labor can make the employer willing to pay that extra non-monetary price in using nonwhites. When the market slackens it may not seem worth it to him. The evidence of unemployment rates, according to Harry Gilman's study of three business cycles from 1953 through 1961, did not support the hypothesis that nonwhites are the last to be hired and the first to be fired: in particular, the amplitude of the fluctuation of nonwhite unemployment rates was no greater than that of whites (though of course the levels were higher).^{*} However matters stand so far as the relative instability of nonwhite compared with white unemployment rates is concerned, for nonwhite income the case is quite clear. Nonwhite income fluctuates much more widely. And if nonwhite money income, whose fluctuations are tempered by money transfers, is more sensitive to short-term changes in the labor market, we would surmise that nonwhite earnings as distinct from income are even more variable.

Fig. 10 is like Fig. 8, only it deals with income to persons. It shows annual percentage changes in median income to persons from 1948 to 1967.^{**} The percentage changes for the 19-year period and three subperiods are shown in Fig. 9(b). The pattern of movement for persons is very much like that for families, except that both the long-term percentage gains and the cyclical fluctuations are even wider for income to nonwhite persons. These points are rather plain in the graphs for the total postwar period and the three subperiod trends.

The greater cyclical instability of nonwhite income can be seen more precisely by removing the trend effect, and comparing the residuals of the year-to-year percentage changes in median income. When the income

^{*} See Gilman, Chapter 3, 1963. Barbara Bergmann and David Kaun, on the other hand, did find support for the "last hired" hypothesis in their study of Negro unemployment. See Bergmann and Kaun, 1966, pp. 90-99.

^{**} Here and in the analyses of the changes of income distribution over time, we have used unpublished census data to extend the CPS income to persons series back from 1953 to 1948.

Fig. 10—Annual growth rates for median income of persons* 1948 - 1967
 (1966 prices)

levels are taken into account, the deviations from the trend (measured by the sum of the squares of the residual over the predicted income) are about 4 times higher for nonwhites in the case of persons, and about 4-1/3 times higher for nonwhites in the case of families. These greater deviations for nonwhites exceed sampling error easily. The great instability of nonwhite family income, and even more, of income to nonwhite persons has, of course, direct implications for hardship -- an aspect of welfare that is not adequately reflected in the usual measurement of the present value of earnings or the smoothed curves of lifetime earnings.

The greater instability of nonwhite income may be related to the fragmentary data often referred to in relative income or in permanent income theories of the consumption function.* These data indicate that nonwhites at any given income level save a larger percentage of their income than whites. Joseph Newhouse has suggested to us that the greater instability of nonwhite measured income biases downward estimates of marginal propensity and average propensity to consume more for nonwhites than for whites.** We would add that, even where a nonwhite and a white have identical lifetime incomes and therefore the same permanent incomes, the fact that the nonwhite receipts fluctuate much more widely would make it reasonable for the nonwhite as a rule to consume less in order to even out the sequence of feast and famine. This is so given the imperfection of capital markets, particularly for nonwhites, and the uncertainties as to the periods and amplitudes of the fluctuations.

* See Brady and Friedman, 1947; Duesenberry, 1948; Tobin, 1951; Duesenberry, 1962; and Friedman, 1957.

** The marginal propensity to consume, k , can be estimated from income, y , and consumption, c , with the equation $c = k y + e$. If we take account of cyclical variation in income, the equation becomes $c = k'(y_p + y_t) + e'$, where y_p represents permanent income and y_t represents transient income. y_t has zero mean and some positive variance and is independent of y_p . The regression coefficient for the second equation is estimated as

$$\hat{k}' = \frac{\text{Cov}(y_p + y_t, c)}{\text{Var}(y_p + y_t)} = \frac{k \text{Var}(y_p)}{\text{Var}(y_p) + \text{Var}(y_t)}.$$

$\hat{k}'$ is therefore an unbiased estimate of k only when $\text{Var}(y_t) = 0$, but otherwise it will underestimate marginal propensity to consume.

Nonwhites who want to avoid the risks of very low consumption would have to maintain reserves that would reduce their lifetime consumption. If the nonwhites do not steadily save more and consume less (and the data, despite their very frequent use in analyses of the consumption function, are piecemeal and ambiguous) they are worse off than whites, not merely because their lifetime income and consumption are generally lower, but because these are also much unsteadier.

The upshot of these considerations is to reinforce the judgment that the greater instability of nonwhite income makes nonwhites worse off compared with whites than the comparisons of their averages and totals accumulated over time would indicate.

For both nonwhites and whites, the growth rates of income to persons are generally lower than those of family income since both white and nonwhite women increased their participation in the labor force and their contribution to family income. White women participate less, but in the postwar period increased their participation more than nonwhites. In March 1969, it was 12 percentage points lower for white women, but was as much as 20 points lower in past decades.* As a result, the relative (to white) growth rate of income to nonwhite persons (the aggregate of men and women) is higher than the relative growth of nonwhite family income. The growth rate of nonwhite income to persons was more than double that of white (3.1 percent per year compared with 1.5). The growth rate of nonwhite family income was about one-third higher than white. (3.8 percent per year compared with 2.8 percent.)

Short-term ups and downs in the labor market have long-term effects on race differences in income. Slack markets reduce incentives for employers to train unskilled labor for more highly skilled, better paying jobs; and reduce the rewards to employees for investing time and money in acquiring skills.** Labor markets that are tight enough and last long enough have the reverse effect. Employer prejudice may be overridden by the gap between the demand for and the short supply of

* Monthly Labor Review, June 1970, p. 12.

** See Johnson, 1966.

the favored kind of labor. And there are net incentives for minorities to migrate to higher income regions, occupations, and industries. Tight labor markets not only alter and increase a minority's productive potential by offering it job training and experience in higher level skills, they also, as John McCall suggests, provide employers with information as to what that potential is and so can modify stereotyped underestimates.* The Korean War and again the Vietnam War were the times of greatest improvement since World War II in nonwhite median income. (The more fragmentary evidence on World War II gains for nonwhites shows the same. The changes for white as well as nonwhite women during World War II may be the most familiar example of the immediate short-term and the residual long-term effects of a very tight labor market.) Income to nonwhite persons has not returned to pre-Korean troughs either in absolute terms or relative to white.

RELATIVE NONWHITE AND WHITE DISTRIBUTIONAL CHANGES IN TOTAL MONEY INCOME

But again, we are concerned not only with changes over time in median incomes, but with changes at other quantiles as well. To consider changes along the entire income distribution, we start with the semi-log curves shown in Fig. 2 for persons in 1967. Then we add to them the similar curves for white and nonwhite persons in 1949. These are all shown together in Fig. 11. At all percentiles both white and nonwhite incomes have improved. (Incomes for both years are given in 1967 dollars.) For many purposes, we have found more revealing another way of comparing white and nonwhite incomes for the two years. Here, we use the income levels at each quantile for each year to form the ratio of nonwhite to white income at each quantile for each of the two years, and then plot a new graph of nonwhite to white income ratios against quantiles in the income distributions. This is illustrated in Fig. 12, which shows that the income ratio has improved for all quantiles,

* McCall, 1970. McCall's work, done independently and in parallel with our own, used different methods (a Markov mover-stayer model) and different data (Social Security Administration work history information). It reaches a similar conclusion about the greater instability of non-white incomes.

Fig.11—Income distribution of aggregate persons: 1967 and 1949

Fig.12—Ratio-at-quantiles comparison for persons,
1949 and 1967

but the improvement is generally greater at lower quantiles. This is more easily seen by subtracting the nonwhite to white income ratios for 1949 from those of 1967 to get the curve of ratio differences shown in Fig. 13. Figure 13 also takes account of sampling variability in the income data, and the lower boundary of the shaded area represents the ratio difference at each percentile for which we have about 95 percent confidence that the true value is equal to or greater than the amount shown.

This again helps to clarify and distinguish possible objectives. We observe that nonwhite median income has improved at a greater rate than white median income for both persons and families and that in relative terms the improvement for nonwhites has been greatest at the low percentiles for persons. Thus, efforts to achieve the distinct though related and useful goals of reducing poverty and hard-core unemployment would be directed at those parts of the income distribution where the greatest nonwhite relative improvement has already occurred, leaving the higher percentiles relatively unaffected. Notice that in Fig. 13 it is only in the upper 10 percent of the income distribution that we are not at least 95 percent confident that nonwhite income has improved relative to white income. And in the upper 10 percent, we are talking not just about millionaires: income to nonwhite persons at the 90th percentile in 1967 was only about \$6,796. Thus, a substantial effort aimed at the higher and middle percentiles as well as at the lower ones will be required in order to equalize white and non-white income distributions.

The pattern of relative nonwhite improvement in income position for families is more dependent on the choice of years than in the case of persons. The trend of greater improvement for lower percentiles is clear for persons when any earlier year for which CPS data are available is compared with either 1966, 1967, or 1968. However, in the case of families, we find this pattern occurring in a comparison of either 1945 or 1949 with 1967, but not for either 1947 or 1948 with 1967. Fig. 14 illustrates the 1947 to 1967 comparison for families. We find a horn-like opening at the lowest percentiles, but there is roughly

Fig.13—Aggregate persons—differences in ratios of nonwhite to white incomes at selected percentiles: 1949 to 1967

Fig. 14—Ratio-at-quantiles comparison
for families, 1947 and 1967

equal improvement from about the 50th to the 80th percentiles, so that overall the improvement is slightly greater for the upper half of the distribution than for the lower half for families since 1947.*

The greater relative improvement in total money income at the lower percentiles displays the effect of the increase in transfer payments since World War II (an increase that has, of course, been neither steady over time nor uniform in its effect on all categories of low income groups). In fact, as Fig. 15 shows, the personal income ratio-at-quantiles curves have tended to rotate clockwise since the late 1940s, with the upper percentiles as a fixed pivot.

The short run behavior at the low percentiles might be expected to exhibit the combined effect of this nonuniform trend of increase in transfer payments and a cyclical instability even greater than that at the median. And, in fact, in periods of cyclical expansion such as the long period of growth from 1958 to 1967, the nonwhite to white income ratios grew more rapidly at the lower percentiles than at the median but declined less, or even grew, in comparison with the median at the lower quantiles during contractions such as that between 1948 and 1949.

RELATIVE DISTRIBUTIONAL CHANGES SINCE 1939 IN WAGES AND SALARIES

The preceding paragraphs talk of postwar changes beginning with 1947 for family income and starting a year or two later for income to persons (the starting points for the continuous CPS time series on income by color). For earlier times income data by color are hard to come by, and income distributions by color especially so. The 1935-1936 Consumer Purchases Study** offers some distributions by color; but they represent the Negro population inadequately and cover only some parts of the country, include income in kind as well as money income, exclude direct relief payments, and are not comparable to data

* From 1945 to 1967 the improvement in family income in the lower half is triple that in the top half. For possible limitations in the 1945 data, see page 48.

** U.S. National Resources Committee, 1938.

Fig. 15 — Ratios of income to persons at selected percentiles of the income distribution, 1966, 1949 and 1959

for the postwar years. Estimates for earlier periods are based on the decennial censuses of occupation and are constructed by using wages and salaries or earnings or total money income weights from a later period and applying these weights to very large classes of occupations. (Gary Becker, for example, applies 1939 wage and salary weights to a three-category classification: skilled, semiskilled, and unskilled.) There are no data on relative changes of nonwhite income within occupations.

Using unpublished census data, we have been able to make a comparison between white and nonwhite wage and salary distributions in 1939 and 1967. This 28-year span seems the longest permitting any confident comparison. Fig. 16 shows the wage and salary ratios for the two years, both for full-time and part-time workers.

It is quite clear from this graph that for about 80 to 90 percent of the wage and salary distribution, the nonwhite to white ratios have roughly doubled in the 28-year period. The trend of greater improvement in lower percentiles noted earlier in the case of total money income to persons is not present in the case of wage and salary income to persons -- a confirmation that improved welfare arrangements benefiting nonwhites in the lowest percentiles rather than higher earnings account for the greater closing of the gap at that end of the distribution. (Detailed data recently made available by color on types of income other than earnings for 1968 strengthen this conclusion.)

CHANGES SINCE 1967

The nonwhite to white ratio of median incomes changed very little from 1967 to 1969 for families, increasing from .621 to .625. The ratio changes across the distribution are generally small (mostly less than 2 or 3 percent), though the slope of the ratio-at-quantiles curve is somewhat smaller in the middle of the distribution, and the decline at the top appears to be somewhat sharper. The ratio at the median for persons did increase somewhat, from .623 in 1967 to .642 in 1969. The persons ratio curve for 1969 is more consistently above that for 1967 than in the case of families, though for both persons and families they intersect several times.

Fig. 16 — Ratios of wage and salary income of all wage and salary workers and of year-round full time workers: 1939 and 1967

WHY DO THESE RESULTS DIFFER FROM SOME OF THE MORE COMMON STATEMENTS?

1. Choice of Years

For one thing, the changes over time observed in such statements depend on the time covered, and many of the comparisons measure the difference between two rather accidentally chosen years. Given the relatively extreme fluctuations of nonwhite income, this has a very large effect. The most pessimistic conclusions stem from comparing the Korean highs with pre-Vietnam low points. But even the two most recent decennial censuses can mislead. They deal with income in 1949 and 1959, two recession years, and this has strongly influenced the results of many investigations. The censuses are a unique, invaluable, and much used source of detailed income data. But are not unaffected by their arbitrary position in the business cycle. This has biased not only longitudinal studies but cross-sectional ones as well.

To illustrate, consider the three ratio-at-quantiles curves for persons in 1949, 1959, and 1966 shown in Fig. 15. Here we can see that the improvement for nonwhites relative to whites between 1959 and 1966 greatly exceeds that between 1949 and 1959. The use of 1959 data without corrections based on other years may bias conclusions from cross-sectional studies as well. To take an example, prospective lifetime earnings and relative marginal returns to schooling of whites and nonwhites are often estimated by using only the 1959 income of various age cohorts in that year. This neglects trends as well as cyclical effects -- and, as we have seen, the long-term percentage rate of growth in median income for nonwhites substantially exceeds that for whites; and nonwhite income relative to white is particularly low in recession years.

2. Focus on Income to Men

A second thing that has frequently misled inference in the field is the focus on income to men. A good many studies deal with male income but draw conclusions about the total nonwhite population. Fig. 17 suggests the combined biases that can result from the arbitrary

Fig.17—Ratios of income at selected percentiles of the income distribution for males, 1949, 1959 and 1966

choice of years and an exclusive focus on men. It shows the ratio-at-quantiles curves for men in 1949, 1959, and 1966. The improvement to 1966 for males is clearly less dramatic than for aggregate persons, and from 1949 to 1959 the income ratios decline for many percentiles. This indicates that the improvement for females would be even greater than that for aggregate persons. Unfortunately, the median income for nonwhite females in 1949 fell within the lowest income interval published so that no income ratios could be computed for the lower half of the distribution.

3. The Use of Averages Rather than Distributions

A third difference between the results we have presented and many more familiar statements is that the latter tend to use only the median or mean or just a few points on the distribution. The possible misleading effects of such a limitation are illustrated neatly by Fig. 18, the ratio-at-quantiles comparison for families in 1945 and 1952. The two curves cross just about at the median, so that a comparison of ratios of median incomes only for the two years would lead one to conclude that there had been no change in the income position of nonwhites relative to whites. However, as can be seen from this graph, there were relative changes at all parts of the distribution except the median. The ratios improved in the lower half of the distribution, and declined in the upper half. This is, of course, an extreme case, but it illustrates nicely the need to consider the complete distribution of income rather than only the median.

The 1945 to 1952 comparison serves as a reminder also that the starting points for the continuous series on income after the war -- in 1947 in the case of families and in 1948 in the case of income to persons -- are accidental. This puts at hazard some of the familiar generalizations about subtrends within the postwar period. The Current Population Survey of income got underway in 1944 and information by color has been put out regularly only since 1947. However, distributions can be obtained for total income to families in 1945, and we have used them in Fig. 18. The CPS sample at that time was much smaller

Fig. 18 — Ratio-at-quantiles comparison
for families, 1945 and 1952

than the current one (8,000 households compared with about 50,000 households in 1968); and the sampling error is larger. More serious (since we can take account of the sampling errors), there may be some undisclosed systematic bias limiting the use of the 1946 survey of 1945 income. For example, we do not know what the effects of the inclusion and exclusion of members of the armed forces were, and this could be important for the year 1945. Nonetheless, this and other evidence suggest that most of the improvement from 1939 to 1947 took place between 1941 and 1945.* Statements that divide the postwar period into two subperiods -- a Golden Age followed by a Fall** -- are dubious for their start as well as their finish.

4. Problems in Exclusive Use of Family Income

Fourth, most of the common statements refer to nonwhite relative family income, and as we have seen, family income is a more rubbery unit subject to alteration with changes in family structure. Nonwhite relative family income grew more slowly than income to persons.

5. Income Differences Versus Income Ratios

Fifth, several of the familiar statements refer to increasing dollar differences between whites and nonwhites.*** We have taken ratios or percentage differences or logarithms or the like as more appropriate measures from a welfare standpoint.**** If one regards

* In fact by 1944: 1945 was a year of recession from the wartime peak.

** See, for example, the statements of Tobin and of Ross quoted in the introduction.

*** Fein and Michelson hold the problem is that "the absolute spread between white and nonwhite median family income is rising." Washington Post, January 14, 1968. Vivian Henderson writes, "The real predicament" of Negroes is that they are "losing rather than gaining ground in reaching dollar parity," and "People do not spend or save percentages. They spend and save dollars." Henderson, 1967, pp. 76-104.

**** The use of differences in this context seems to rest on the assumption that utility is proportional to income, or at least that the slope of utility as a function of income is constant and that prudent persons maximize expected income. However, at least since Daniel

the absolute dollar difference as defining the problem, then it would appear that Negro male wage and salary earners were much better off in 1939 compared with whites than they are today. The median of their wages and salaries was \$460, 41 percent of whites, and \$652 less. In 1967 Negro median wages and salaries were about 64 percent of whites, and \$2,464 less (\$4,369 compared with \$6,833). If we adjust the 1939 wage and salary income to 1967 dollars,* we get median nonwhite and white incomes of approximately \$1,095 and \$2,650, for an income difference of about \$1,555. If the nonwhite median had been about 77 percent of the white median in 1967, the dollar difference would have been about the same as in 1939. Eliminating a \$1,550 difference would then mean a 29 percent increase in income for nonwhites in 1967, whereas in 1939 it would have meant more than doubling nonwhite income. It seems implausible to suppose the marginal utility of the dollar difference is the same in both cases. In fact, while appropriate in some circumstances, the use of absolute or dollar differences here (as in the case of discussions of the economic development of The Third World, and the gap between the rich and poor countries), tends to serve a hortatory rather than an analytic function. (The Japanese per capita GNP tripled in the decade beginning 1953 while that of the United States increased by less than 50 percent. The Japanese lost ground in dollars but most of us, including the Japanese, think they are catching up.) Welfare considerations aside, even for purposes of prediction, percentage rates of change have an obvious relevance to economic growth. One would expect

Bernoulli and Gabriel Cramer in the 18th century, it has been clear that such a rule of behavior is inconsistent with observed practices both of insurance and fair gambling. Cramer and Bernoulli indicated that not expected income but the expected utility of income is maximized. And the utility of an increment in income depends on the amount of income to which the increment is added. While plausible utility functions may differ from each other for extreme values of income, the logarithm of income is the most widely accepted approximation for the moderate ranges of income that include all the income distributions considered in this study. For an excellent historical and critical comment on these matters, see Savage, 1954, pp. 91ff.

*The adjustment is actually based on the change in the price index between 1940 and 1967, since the value of the index for 1939 could not be found.

that a \$1,550 increase would take a good deal longer starting from a \$1,095 base than starting from a \$4,400 base. It is because the rate of change or amount of growth at a given date is related to size at that date that exponential functions are generally useful in forming our expectations about growth.

6. Comparison of Population Proportions at Fixed Income Levels

Sixth, the ratio of proportions^{*} at a given income is frequently used in comparing white and nonwhite proportions above or below a poverty line or some given income levels. However, aside from the troubles that can stem from focusing on one or two arbitrary dividing points in the distribution, such ratios of cumulative percentages do not directly measure relative income and, as we suggested earlier, can be quite misleading. Consider the case of the poverty line for families: 56.0 percent of nonwhite families and 16.5 percent of white families were below the poverty line in 1959, giving a ratio of .295 for the white-to-nonwhite incidence of poverty. In 1968, 32.4 percent of nonwhite families and 8.4 percent of white families were below the poverty line, giving a white to nonwhite ratio of .259. The white to nonwhite ratio then, decreased, suggesting that in relative terms things improved more for whites than for nonwhites. However, if we compare proportions above the poverty line, we find that the nonwhite to white ratio increased from .527 in 1959 (44.0 percent for nonwhites and 83.5 percent for whites) to .738 in 1968 (67.6 percent and 91.6 percent for nonwhites and whites respectively). The nonwhite to white ratio of proportions of families above the poverty line, then, increased, suggesting that in relative terms things improved more for nonwhites than for whites.^{**}

The results are similar when we compare proportions above and below \$8,000. The nonwhite to white ratio of proportions of families above \$8,000 (price adjusted, in 1967 dollars) was .278 in 1947 (5

* See footnote 1, p. 19.

** U.S. Bureau of the Census, 1969, Table D.

percent of nonwhite families and 18 percent of white families) and .509 in 1967 (27 percent of nonwhite families and 53 percent of white families). This suggests that in relative terms the situation improved more for nonwhites. The white to nonwhite ratio of proportions below \$8,000 decreased from .863 in 1947 to .644 in 1967, indicating greater relative improvement for whites.*

The reason for this apparent contradiction is indicated by the curves shown in Fig. 19. If we have two curves of identical shape but differing only by a translation along the horizontal (income) scale, we would find that income differences would be the same for all quantiles (Fig. 19a). Or, if the horizontal scale were log income, we would find that income ratios would be the same for all quantiles. But with either income or log income, the use of the ratio of proportions measure would indicate increasing nonwhite to white ratios if we compare proportions (or quantiles) below incomes, and decreasing nonwhite to white ratios for proportions above incomes. Extending this to changes over time, even if the translations over time for the income distributions were the same for whites and nonwhites (Fig. 19b) on the income scale (or on the log income scale), we would still find that white to nonwhite ratios of proportions below any income figure (low income or high) would decrease, and nonwhite to white ratios of proportions above any income figure would increase. Of course, the nonwhite and white curves do not differ only by a translation on either the income scale or the log income scale, nor have changes over time preserved the shapes of either income curve. But the point here is that ratios of proportions above or below given income levels may reveal little or nothing about relative improvement over time of white and nonwhite incomes.

7. Migration and "The Reverse Harvard-Yale Paradox"

A seventh point that has sometimes misled inference has to do with a phenomenon we have thought of as "The Reverse Harvard-Yale Paradox,"

* U.S. Bureau of the Census, 1968, p. 8.

Fig.19 — Illustrations for case where the white minus nonwhite income differences (or for log scale the nonwhite-to-white income ratios) are the same for all quantiles

a title suggested by the familiar story of a student who transferred from Yale to Harvard (or vice versa, depending on whether a Yale or Harvard man tells the story) and raised the average in both places. The reverse statistical phenomenon may work to reduce income ratios when we infer them from subgroup changes over time. And, in fact, it may have something essential to do with the dynamics of relative growth, with shifts of minorities from low income regions, occupations, and industries to higher income regions, occupations, and industries. For one might expect to find: (1) that the ones who make the shift are in general better educated, more enterprising, and have higher incomes than the average in the places that they leave; (2) that, as a result of the shift, on the average the move will raise their own incomes; but (3) not immediately to the average level at their destination. From a national standpoint, that is from a standpoint including all those involved both at the starting point and at the destination, there is then a net relative improvement. But looking at the starting point and at the end point separately, relative income at each place may decline. More generally, the relative improvement in the national aggregate could be expected to be larger than those displayed in the subtotals.

This has happened in the case of geographical migration. There has been a very large migration of nonwhites from the South to the North and West. There is substantial evidence that the migrants were younger and better educated than the average.* Between 1955 and 1960 the South lost a fifth of all the nonwhite men 25 to 29 years old who had some college training, but only 6 percent with elementary schooling. And, in fact, the regional ratios between the two census years show declines in the income of Negro men while the overall ratio was static,** and in the surge since 1959 the improvement has been larger for the total than would be inferred from the subgroups. The smaller the geographical subunit, the more misleading the subunit income ratios

* See Newman, 1956.

** See Batchelder, 1964.

may be; so the trouble is likely to be even more acute for cities or neighborhoods than for regions.

A migration that means a net improvement from the standpoint of the aggregate of those involved at the starting and end points of the migration is all to the good if one is interested in people. If one is interested in places rather than people, on the other hand, the story may be very different. And, as Harry Johnson points out, politicians tend to come attached to places.

As our formulation above suggests, this problem in comparing subgroups affects not only geographical migration, but also shifts to higher income job categories or higher income industries. To take the case of occupations, the lower relative income of nonwhites is a product of two components: an underrepresentation of nonwhites among job categories that pay high average incomes, and a lower than average income for nonwhites within the job categories.* A shift in the proportion of nonwhites toward the higher paying job categories then can be accompanied by a transient lowering of nonwhite relative pay within the job category. To overcome the large remaining gap between nonwhite and white income, however, it is plain that ultimately there will have to be large improvements in both components of the product, that is, in the relative distributions of nonwhites in jobs and their relative rate of pay within the job categories.

8. Occupational Shifts Understate Income Changes

An eighth point about estimates of changes over time in nonwhite relative income specifically affects those estimates of very long term trends that have been made using the occupational distributions in the

*The nonwhite to white income ratio $R = (G_n/G'_n) \cdot (G'_n/G'_w)$, where G_n and G_w are nonwhite and white incomes respectively, and G'_n represents the income of a population that has the white job distribution, but the nonwhite rates of pay within each job category. Thus, the factor G_n/G'_n is an index of relative job distributions with fixed nonwhite income weights, and the factor G'_n/G'_w is an index of relative income within job categories, using fixed white job distribution as weights.

decennial censuses with fixed wage and salary or other income weights. Such estimates do not reflect the relative improvements in nonwhite real incomes within job categories, but only the improvements in the distribution of nonwhites among jobs. They estimate only one of the two components of the product that measures changes in relative nonwhite income. Moreover, some of the best known of these use extremely broad categories.* However, the effects of past and current discrimination in the job market are displayed not only in the distribution among jobs, but also in differences in the rate of pay within jobs. The analogy sometimes suggested with indexes of output where one wants to eliminate

* See, for example, Becker, 1957, Chapter 9. In this fruitful and pioneering theoretical work, Becker presented an index constructed by applying 1940 census estimates of 1939 wage and salary weights to three broad categories for whites and nonwhites: skilled, semiskilled, and unskilled.

Elton Rayack has criticized Becker's index for the use of fixed income weights and constructed an index of his own designed to reflect the fact that there is a narrowing of differentials between the average earnings of skilled workers of both races and the average of both races in unskilled occupations. (Rayack, 1961, p. 209. Becker, 1962, p. 214.) Rayack's point, which Becker answers adequately, is quite different from our own. Becker's index measures improvements in job distribution among nonwhites, but it says nothing about changes in nonwhite relative income within job categories. Neither, however, does Rayack's index.

Some misunderstanding may be created by references to the supposed stability from 1910 to 1950 of such an index of the relative changes in the distribution of nonwhites among very broad job categories as implying that there was no change in market discrimination in those 40 years. "The average occupational position of Negroes has risen quite strikingly in both the North and South, but their position relative to whites has been remarkably stable; in the North this was only slightly higher in 1950 than in 1910, and in the South it was slightly lower in 1950 than in 1910. While many important and relevant changes may have taken place in both regions, a very tentative conclusion from this stability would be that neither striking increases nor striking decreases in discrimination against Negroes have occurred during the last four decades." See Becker, 1957, p. 125. Cf. also Batchelder, 1964, p. 527.

However, for the reasons given, as well as several others connected with problems of separating the effects of past discrimination in schooling, etc., from current market discrimination, that index does not measure Becker's "Market discrimination coefficient," which Becker defines as the proportional difference between the equilibrium wage rates for whites and for nonwhites with and without discrimination -- assuming white and nonwhite labor are perfect substitutes. A good many such inferences have been much less tentative than Professor Becker's.

the effects of price change does not apply. In estimating the changes in relative nonwhite income, one needs to take into account changes in real income relative to white within occupations. Gary Becker notes,

A decrease in discrimination could increase merely the relative income of Negroes within an occupational category and not change their relative occupational distribution. However, since discrimination against Negroes has been greater in the more skilled occupations, a large decrease in discrimination would probably also increase their opportunities in these occupations.*

Supposing this is true, the magnitude of a total reduction in discrimination has nonetheless to be measured as a product of the two components.

RELATIVE IMPROVEMENT HAS CLEARLY TAKEN PLACE...

A good many other statements suggesting that there has been no significant improvement of nonwhite income over time have been based on less complex inadequacies than those we have discussed. For charity's sake, we shall not expand on the simpler errors. In any case, the evidence for relative improvement over time (in the last two decades, since the Korean peak, in the last decade, and so on), of the nonwhite income distributions as a whole, is quite plain. Such evidence can be summarized by measures using the area between the income-ratio-at-quantiles curves for a recent and for an earlier year and taking sampling errors explicitly into account. In the case of income to persons, we have better than .999 confidence that there was relative improvement for nonwhites from any of the pre-1960 years considered to 1967. The evidence is nearly as strong for family income. And even when we take very short periods such as 1963 to 1967, for example, the confidence levels for improvement are still .998 for both families and persons. Nonwhite income has plainly improved more than white income. That, however, hardly means that the problem of race discrimination in income will soon be solved.

* Ibid., p. 114.

...BUT WE ARE STILL FAR FROM CLOSING THE INCOME GAP

In ending this discussion of changes over time, two points need emphasis. They suggest strongly that, though there have clearly been sizable absolute and relative improvements, these can hardly be the basis for unclouded optimism. First, that nonwhite relative income has been extremely sensitive to the tightness of the labor market suggests that without a well calculated and executed policy to avoid a setback after Vietnam, such a setback is quite likely. That the relative income of nonwhites did not return to pre-Korean troughs is only a little comfort. It did decline quite a bit after the Korean peak.*

Second, if we project the rate of convergence of nonwhite and white median personal incomes since 1948 into the future, it will take until the end of the century before nonwhites overtake whites. And longer than that for median family income. Extrapolations at the lower end of the distributions are somewhat more promising. As for the top end of the distribution, simple extrapolations would show no future convergence at all.

* As an indication of the possible effect, consider the relationship between the rate of change in GNP with the rate of change of white and nonwhite median incomes. Although the relationship is not very strong using only one independent variable, the regression results are nevertheless interesting. Letting x = the rate of change in GNP, and Y_1 = rate of change in median income to nonwhite persons, Y_2 = rate of change in median income to white persons, Y_3 = rate of change in median income to nonwhite families, and Y_4 = rate of change in median income to white families, we find the following equations:

$$\begin{array}{llll} Y_1 & = & -.0866 + .8464x, & R^2 = .185, \\ Y_2 & = & -.8973 + .5963x, & R^2 = .354, \\ Y_3 & = & -.2653 + 1.0448x, & R^2 = .293, \\ Y_4 & = & .5126 + .5807x, & R^2 = .350. \end{array}$$

For both persons and families, the coefficient is higher for nonwhites than for whites, indicating that nonwhite income is more dependent on the general condition of the economy. The coefficients are significant at the 5 percent level for all but the first of these four regressions. The years used are 1948 to 1967 for persons and 1947 to 1967 for families.

Given the present large disparities, convergence will require a drastic improvement in the relative distribution of nonwhites among occupations and an improvement of their relative income within occupations. This in turn will require changes in education. But not only that. In the next section we consider the effects of job distribution and years of schooling, as well as the effects of the age structures of the two populations.

IV. SOME COMPONENTS OF THE INCOME DISPARITIES

AGE STRUCTURE

The criterion for policy that has been implicit in the analysis so far assumes that it is a reasonable aim from the standpoint of equity that nonwhites overtake whites in the level and distribution of income, subject to a very few qualifications affecting such demographic traits as age distributions or family structure. As for the qualifications, take the example of age. Some differences in earnings can be accounted for by differences in the age structures of the nonwhite and white populations and would persist even if the level and patterns of individual lifetime earnings were the same in the two populations, so long as the age structures continued to differ. A 20-year-old near the start of his career doesn't in general expect to receive as much income as he will receive at the age of 40: individuals characteristically tend to increase in their ability to do work, reach some peak, and then decline as the composite result of changes in their knowledge, strength, energy, etc. So two individuals in the same line of work at different stages in their life cycles would expect to receive different incomes even if equal work is paid equally and their lifetime earnings are equal.

In fact, the nonwhite population has a very different age structure from that of whites. For example, in 1967 the median age for Negroes (who make up the overwhelming bulk of the nonwhite population) was 21.1 compared with 29.1 for whites. The median age for Negro men was 19.7 compared with 28 for whites. These relationships apparently have been altering drastically in recent years, and it seems that race differences in median ages used to be considerably smaller. At any rate, they are smaller now for the part of the population that is over 14 years old and receives income: in 1967 Negro men with income had a median age of 38.9 compared with 41.8 for white men. As a consequence of the differing age structures of income receivers, if Negro men had the same lifetime earnings -- that is, the same earnings as whites for each age group -- then median income would be some 98 percent

of white median income; and income levels would be lower than those of whites for most of the income distribution, especially at the low end. Near the 7th percentile, for example, it would be less than 84 percent of whites. (This calculation was made by taking white incomes at each age group and assigning these incomes to a population with the Negro age structure.) Yet these do not appear to be welfare differences nor, therefore, differences in welfare resulting from discrimination. With such a transformation, there would still be inequalities but not necessarily inequities. In fact, it seems likely that such income inequalities due to differences in age structure may continue to increase for the next few years. This, at any rate, is suggested by the greater disparity between the age structures of the Negro and white populations as a whole, as distinct from the age disparity of the populations of working age with income.

However, if the adjustment is made the other way around -- that is, if instead of assigning white incomes to Negro age cohorts, one used the white age structure with Negro incomes -- then this hypothetically older Negro population would experience, as the result of that artificial advance to later stages in lifetime earning careers, little or no improvement in income for most of the distribution. For men, the improvement in the ratio of median incomes would be only 1/4 of 1 percentage point and would average about 1 percentage point across the distribution. It is of interest that this adjustment shows a more sizable improvement at the lowest percentiles. For example, it makes a ratio difference of .07 near the 11th percentile, but less than .01 for all of the upper 2/3 of the distribution (see Fig. 20). For women, the ratio of median incomes would actually drop by about 8 percentage points with this adjustment.

The results of this second statistical adjustment are of substantive significance. The difference between assigning white incomes to the black age distribution and assigning black income to the white age distribution means that the life pattern of earnings for blacks is very different from that of whites, that, in particular, the payoff to

Fig.20— Relative male income in 1967 adjusted for age

increased age and experience is less for blacks.* Blacks are concentrated in less skilled jobs where in general long experience contributes less to productivity. Even where they are in jobs where experience would count, they are likely to have come to these jobs with less of the formal schooling that would enable them to benefit from on-the-job training, to receive less on-the-job training, and to be rewarded less for the training and education that they have received. The data, however, do not permit separating these complementary factors.

We observed above that the difference in white and black median ages for income receivers is less than the difference for median ages of the two entire populations. This suggests that measuring changes over time for distributions adjusted for age differences for men would show a greater relative improvement than in the case of the unadjusted distributions and particularly at the low end. This is in fact the case, as shown in Fig. 21, which compares adjusted distributions for men for the years 1949 and 1967.** This result confirms and amplifies

* Lester Thurow has studied the joint effects of education and experience for nonwhite and for white men, in 1959, and has found the payoff to experience much less for nonwhites. (Thurow, 1968, Vol. I, pp. 267 ff.) He approximates experience by data on the age of individuals less a constant representing the typical school leaving age for a given number of years of schooling. He approximates education by years of schooling and occupation by ten broad occupational categories. All these approximations are admittedly rough. The use of age for work experience, to take one example, ignores the fact that some of the time after leaving school might have been spent out of employment or in jobs unrelated to the ones in which income was earned in 1959. And there is good reason to believe that this is a more important factor for nonwhites than for whites. That is, nonwhites may typically complete any given number of years of schooling at a later age than whites, and may have spent more time in jobs unrelated to their present work. Thurow's calculation of the return to training or experience assumes that all the remaining income differences by age groups after controlling for occupation and years of schooling are due to a return to experience. But, as he is aware, other factors affect income. And several of these may vary as between nonwhites and whites. (See footnote 1, page 81, for a related comment on circularities in the use of lower nonwhite investment in training, measured by lower earnings forgone, to explain lower nonwhite income.) Thurow, moreover, measures the differences in payoff in absolute dollar terms, and the increasing gaps he refers to are dollar gaps.

** Income by race and age was not available from the CPS for 1949. The data used for the 1949 age adjustment were obtained from the 1950 Census.

Fig. 21—Changes over time in age adjusted relative income for men in 1949 and 1967

our earlier observations about improvements at the low end of the income distribution based on data not controlled for age.

PRESENT AND PAST DISCRIMINATION, GENETICS, AND SO ON

It is a fact of common observation that discrimination exists in the labor market today. Nonwhites, quite frequently, do not get paid equally for equal work. However, it is also plain this is only part of the problem. There are many cases where members of a minority receive less money because they do not do equal work, but do not do equal work because they did not have an equal opportunity to acquire the relevant formal schooling or informal training. This is not a case of current discrimination by an employer against an employee: the current difference is the result of a past discrimination that narrowed the earlier educational choices available to the minority. Moreover, the difference in educational advantage may have to do not merely with the number of years spent in school, nor even the "quality" of the schooling, but with its content. Some members of a minority may have gone to school the same number of years in schools measurably no worse than the majority schools, but the schooling may be less relevant for maximizing earnings.* Or the informal education that takes place outside the school in the extended family or among peers or on the job may have been poorer for that purpose.

Moreover, these various disabilities interact. The chances for benefiting from years in school are likely to be limited by disadvantages

* This point needs emphasizing. It differs from the matter of the quality of schooling which has been much in controversy since the Coleman report. It applies particularly to higher education where one would expect a larger diversity of curricula. In the past most Negroes who went to college were enrolled at Negro colleges: in 1947, 85 percent. (See Becker, 1964, p. 94n.) While this has changed drastically in recent times, it is reported to be still true of some 90 percent of Southern Negroes. The curriculum was adapted especially to preparing for the two professions in which Negroes had relatively easy access -- the ministry and teaching in elementary and secondary schools. And "teaching and preaching" are among the lowest paid professions. Recently there has been a large shift among Negroes toward preparation for careers in business. See The New York Times, December 22, 1969, p. 19.

in the knowledge and motivations gained outside of school. The combined disadvantage therefore is not simply a sum, but, as Thurow suggests, more like a product of many separate disadvantages. Finally, many of the factors are hard to define or measure. "Education," especially "informal education," covers not only the transfer of information but the instilling of motives or values that improve the chances for doing productive work in our society; the quality of formal schooling is not measured adequately by the pay of teachers or the cost of school buildings or scores in reading or arithmetic; and the inadequacies of measurement both in respect to quality and content seem likely to increase with the increasing numbers of years of schooling measured. And on many of the component factors there are few or no data.

These examples suggest how hard it is to disentangle the effects of current discrimination in the marketplace from the various results of multiple past discriminations that may in turn have made it unlikely that a minority can compete currently on equal terms. While the fact of current as well as past discrimination is clear enough, the precise magnitudes involved are not clear; and, it appears to us, given our present state of knowledge, they are likely to resist exact determination. The proportion of the current income differences that is attributable to current discrimination in the marketplace is extremely difficult to determine, and in spite of several attempts, it does not seem to us to have been measured convincingly.

Paradoxically, the logical structure of many models that have been used to measure current discrimination against nonwhites has been almost identical with that of models used to measure a supposed nonwhite innately inferior productivity. In both cases, the model builder attempts to show that only part of the difference in the reward or achievement can be explained as a result of some list of factors explicitly treated. The fact that the model leaves a sizable part of the variance unexplained may be taken in the one case as a measure of discrimination, and in the other as a measure of the genetic difference between races.

This odd logical identity was illustrated recently in Arthur Jensen's well-known controversial article, "How Much Can We Boost IQ and Scholastic Achievement?"* Jensen mustered a miscellany of study results that he interprets as evidence for innately lower Negro average intelligence, scholastic performance, and, apparently (the article is not precise in this respect), occupational status and differential earnings of men with the same schooling in the same line of work. The cited miscellany included studies of quite a few scholars who themselves interpret their results as measuring the effects of discrimination: James Coleman, Otis Dudley Duncan, Rashi Fein, and Daniel Patrick Moynihan.

We are not arguing against the use of simple models. Our view is that simple models are fine, and to the extent that they work, the simpler the better. But if a model does not provide an adequate explanation of a complex process, there is no logical basis to use its inadequacies as if they explained and precisely measured something not actually included in the model.

The logical problem is quite analogous to that affecting some economic models designed in the past ten or fifteen years to show the contribution of a specified list of inputs to the measured growth in output. There was a tendency, especially early on, to identify the residual growth of output not explained by changes in input quantities as an increase in the productivity of the inputs and, specifically, as a measure of the contribution of "new knowledge" to increases in output. But, of course, the residuals included errors in estimates of the influence on growth of those factors taken into account, and the influence of all factors not taken into account; the simpler and more inadequate the model the larger the apparent influence of "new knowledge."

Careful attempts to explain differences in earnings between various groups, say between professional and non-professional workers,

* See Environment, Heredity, and Intelligence, Reprint Series #2, compiled from Harvard Educational Review, Cambridge, 1969.

run into quite analogous problems. Friedman's and Kuznets' careful, early investigation into professional incomes before World War II^{*} estimated that (1) professionals earned on the average between 85 percent and 180 percent more than non-professionals; but (2) the extra costs, direct and indirect, of the long training needed for professional work would have called for, at most, a 70 percent extra return to make professional and non-professional pursuits equally attractive financially. A very plausible explanation of at least part of this difference between extra returns and extra costs is that the professions are "non-competing groups." (Young men are not equally able to finance professional training, are not equally aware of opportunities for professional work, and social and economic stratification makes it much easier for some to enter professions and to succeed in them.) But it is also not implausible to assume, for example, that professional work attracts people with higher level abilities than non-professional work. Inference from this analysis had to be qualified accordingly.

It is plain that both public and private institutions have offered nonwhites lesser opportunities than whites to get productive training and education, and that nonwhites have had a much more restricted range of choice among occupations. Further, it's clear that the prejudices of customers, employers, and fellow workers reduce nonwhite productivity in many jobs. Color prejudice, then, has much the same effect on the earnings of nonwhites as would a difference in ability. But the economic and educational processes involved in this result are enormously complicated and the forces that affect learning and the ability to earn money in the marketplace are highly confounded. Our understanding is quite limited. The empirical models available employ, for the most part, variance or correlation analysis or regressions with rather crude linear or sometimes log linear relations, a rather short list of quite coarse variables, and with a good many relevant variables left out of account altogether.

When we say, for example, that we are "controlling for" (or "adjusting for" or "holding constant") "occupation" or "education," it is

^{*}Friedman and Kuznets, 1945.

important to bear in mind that we are not literally talking of "...men with the same schooling and in the same line of work"* who exhibit differences in income or employment rates, or the like. Rather, so far as occupation is concerned, we are talking about people within some very broad category of disparate jobs, one of a small number of sets of jobs into which we have partitioned gainful work. Becker** uses 3 categories; Hiestand, 7; Gilman, 10 (as do we in the occupational adjustments presented below); Blau and Duncan, 17; and so on for larger numbers of still heterogeneous sets.*** But even in a 17 occupation breakdown of males, a "single line of work" such as "salaried professionals" includes physicians and surgeons as well as primary and secondary school teachers. In 1968 the mean earnings of the former were \$16,273, nearly double that of the \$8,240 mean for the teachers. And of course nonwhites are much scarcer among physicians and surgeons than they are among teachers. The distinction between occupational differences and differences in skill and reward within the same occupation is to a considerable extent arbitrary, even when jobs are quite narrowly defined. But the broad categories of jobs for which relevant current data are available neglect a variety of differences that need to be controlled for a moderately convincing analysis of either the effects of current market discrimination or of differences in ability, to say nothing of distinguishing between the effects of discrimination and those of ability.

Analogous comments, of course, apply to controlling for years of schooling as a surrogate for education; and for a good many other variables that figure in the familiar models. And these are only some of the limitations of the familiar models. (1) Some models regress income on variables such as "occupational status" as well as schooling, but determine "occupational status" as a linear function of income and schooling in some past year. (2) The forms of regression used, in

* See Jensen, 1969, p. 16.

** See Becker, 1957.

*** Hiestand, 1964; Gilman, 1963; Blau and Duncan, 1967.

general, lend themselves mainly or solely to the use of a summary statistic for the dependent variable (for example, mean or median incomes or the nonwhite to white ratio of means or medians), even though comparisons at other points in the distribution are quite relevant to the policy points at issue. It is not surprising, then, that in general a substantial part of the variance in nonwhite-white income differences (or unemployment rates or scholastic achievement or IQ) is not associated with the coarse variables of the models.*

Fortunately, policy choices need not wait for complete understanding. We don't have to know the exact dividing line between the effects of past and current discrimination to support programs to reduce both. It is plain that both are very substantial and that they reinforce each other.

As for possible genetic difference, our view is not unlike that of Eckland and of Duncan, and even more that of the geneticists James F. Crow and Joshua Lederberg.** There are, of course, native differences among individuals in abilities of various sorts. However, so far as race differences are concerned, genetic theory does not imply that each of the various traits associated with skin color has persisted because it has had a survival value in past environments, nor that the effects are immutable. And genetic theory has even less to say about the relation of race differences to the complexities of contributing to the product of a modern industrial society. The mischief to be done by rejecting a true hypothesis that there are no substantial genetic factors disabling nonwhites from contributing on a par with whites is so large compared with the consequences of accepting that hypothesis if it is false, that the null hypothesis seems the appropriate one on moral and political grounds as well as scientific ones. The

* A. H. Pascal and L. A. Rapping's Racial Discrimination in Organized Baseball, RM-6227-RC, December 1970, may be a unique example of a study that convincingly analyzes the results of current discrimination in the market place, separating its effects from others. For baseball it was possible for them to measure precise line of work, ability, and reward independently.

** Eckland, 1967, pp. 173-194; Otis Dudley Duncan, 1969. For James F. Crow's views, see Crow, 1969, pp. 153-161. For Lederberg, see Washington Post, March 29, 1969; Washington Post, April 5, 1969; and The Stanford Daily, October 21, 1969.

appropriateness of this stance is reinforced by a candid and realistic view of the many limitations in our studies and in our understanding of these matters.*

With these caveats in mind, we turn to a summary of preliminary work on white-nonwhite differences in income distributions associated with differences in the distribution of major occupations and years of schooling.

OCCUPATIONAL DISTRIBUTIONS

Nonwhites are greatly overrepresented in some jobs and underrepresented in others, a kind of occupational segregation. Many studies have measured this dissimilarity of the nonwhite and white occupational distributions.**

While a very substantial occupational dissimilarity appears to be bad in itself, such as segregated housing and schools, the mere fact of dissimilarity doesn't offhand appear to explain why nonwhites have lower incomes than whites. It is conceivable that occupations might be "separate but equal" so far as income is concerned. The relation of

* Jensen himself warns that "...no adequate heritability studies have been based on samples of the Negro population of the United States," but nonetheless favors a genetic explanation of race differences in achievement. On this Lederberg comments: "This position will be difficult to confirm or refute by any experiments that I can foresee as realistically possible in the face of existing cultural alienation. Large segments of either community refuse to be color blind. How then can we discuss experiments like adoption of black children into white families, with any realistic expectations of their answering such subtle questions as the genetic basis of the development on the brain? We part company on the impact of racial alienation on intellectual development. I believe this is quite sufficient to account for the statistical observations without having to speculate about other genetic factors. Jensen fails to see enough difference in early environments of children he believes to be in comparable economic strata, to account for later school difficulties. We must point out that 'comparable' groups have never been standardized even for simple, physical health or for nutrition during pregnancy." Washington Post, March 29, 1969.

** See, for example, Hare, 1962; Hodge and Hodge, 1965; Taeuber, Taeuber, and Cain, 1966. The two preceding articles appear in Occupational Assimilation as a Competitive Process: Two Views, Reprint 11, Institute for Research on Poverty, The University of Wisconsin, 1967.

dissimilarity, in fact, is symmetrical with respect to whites and nonwhites. Nonwhites may be scarce in "white occupations" because they are excluded. Whites may be scarce in "nonwhite occupations" because they regard them as nonwhite and inferior. Whatever the reasons for the segregation, the effects might be the same. A nonwhite in the jobs accessible to him has to compete with an extra supply of nonwhites who are capable of working in "white occupations" but are excluded from them. And he is free from the competition of the whites who chose to work elsewhere. A white, on the other hand, limited to some occupations by his own or community prejudices, would experience a parallel extra competition from members of his own race whose prejudices limit their choice, and would benefit by freedom from the competition of the excluded nonwhites.

The earnings disparity stems from the fact that nonwhites find it specifically hard to get into higher paying occupations and seem to be disproportionately limited to a range of occupations in which they can produce less and are paid less at the margin than whites.

There has been a considerable reduction in occupational dissimilarity in the last decade and a shift of nonwhites to higher paying occupations. The improvement by 1967 was larger than had been anticipated, for example, in the National Planning Association projection made early in the 1960s for the year 1972. Many shifts expected only by 1972 occurred by 1967 and the others were ahead of schedule.* Nonetheless in 1967 nonwhites were greatly underrepresented in high paying occupations.

In Table 1, comparing white and nonwhite earnings for men in 1967 by major occupational categories, we note first that the relative status of nonwhites within occupations (as measured by the ratios of nonwhite to white median earnings) varies across different occupations. But second, the ratio of overall nonwhite to white median earnings is lower than any of the ratios for component occupation groups, with the exception of farmers and farm managers. The lower overall ratio is a result

* For NPA's projections for 1972, see Northrup and Rowan, 1965, Table I, p. 30. For the actual 1967 figures, see Claire C. Hodge, 1969, pp. 20 ff.

Table 1
EARNINGS FOR MALES WHO HAD EARNINGS, 1967, BY OCCUPATION GROUP OF LONGEST JOB^a

Occupation Group	Medians		Means		Proportions ^b	
	W	NW	W	NW	W	NW
Professional, technical and kindred	\$9090	5971	9667	6197	.135	.073
Farmers and farm managers	2804	970	4053	2155	.041	.019
Managers, officials and proprietors	8897	5831	10144	6846	.136	.037
Clerical and kindred	6088	5104	5722	4803	.072	.069
Sales workers	6103	4665	6404	4714	.063	.019
Craftsmen, foremen and kindred	7089	5019	6929	4907	.198	.121
Operatives and kindred workers	5677	4423	5443	4440	.192	.243
Service workers, except private household	3886	3148	4160	3244	.066	.150
Farm laborers and foremen	885	681	1639	1085	.026	.073
Laborers, except farm and mine	2472	2915	3192	3071	.070	.193
Total	\$6290	3780	6621	4009	1.000	1.000
Total for year-round full-time	7396	4964	8131	5125		.630

Notes:

^a10.1 percent of men who had earnings in 1967 were nonwhite.

^bproportions for occupations are proportion of earners who belong to that occupation group.

of the difference in the occupational distributions of whites and nonwhites. Nonwhites are proportionately overrepresented in occupational categories such as operatives, laborers, and service workers, and underrepresented in generally better paying categories such as professional and technical workers; managers, officials, and proprietors; craftsmen and foremen; and sales workers.

We would like to separate the effects of broadly different occupational distributions from the effects of different earnings within major occupation groups. To be sure, we have already stressed that the "within-occupation" differences for the ten major occupations reflect large contrasts in jobs within each category. Among "professional, technical, and kindred workers," independent professionals receive much higher incomes than salaried professionals and may perform rather different functions. And, once again, the salaried professionals include poor ministers as well as rich surgeons.

THE EFFECTS OF IMPROVING THE JOB DISTRIBUTION OF NONWHITE MEN

To estimate the effect of the different occupational distributions (using the categories given in Table 1) on the overall earnings differences, we make an adjustment on nonwhite male earnings as follows. We calculate a new nonwhite earnings distribution from the actual earnings distribution by "re-assigning" nonwhites among the ten occupational classes so that the proportion of nonwhites in each occupational class is the same as that of whites (that is, in effect, we make white and nonwhite occupational distributions operationally equal), but nonwhites are assigned the same earnings within each category as they now receive. The result of this adjustment is an increase in the nonwhite to white earnings ratio of about 12 percentage points at the median (that is, it would increase from .601 to about .723). The effect of this adjustment also, however, is different for points below the median than for points above the median. See Fig. 22. The increase in the nonwhite to white ratio averages about 18 percentage points in the lower half of the distribution and about 11 percentage points in the upper half. Therefore the ratio curve declines at the top even when the earnings

Fig. 22 —Earnings for males in 1967, with adjustment for (10-class) occupational categories

distribution is adjusted for the current differences between the distribution of whites and nonwhites among major occupations. While such a redistribution does more for nonwhites at the low end, the ratios that would result from this adjustment are still substantially below 100 percent throughout the entire earnings distribution. The average proportion of the ratio disparity closed by the adjustment based on these 10 categories is about one third.

THE EFFECTS OF IMPROVING THE JOB DISTRIBUTION OF NONWHITE WOMEN

In the case of earnings to women in 1967, we again find that the nonwhite to white ratio of median earnings in the aggregate is lower than any of the ratios for component occupational groups. See Table 2. In fact, the ratios are above 100 percent in about half of the categories. The most substantial difference, however, is in the white and nonwhite distributions among the occupational categories. 14.1 percent of white women were professional and technical workers, and 33.8 percent of white women were in the category clerical and kindred workers, while only 8.8 percent and 16.4 percent of nonwhite women were in these two categories, respectively. On the other hand, 23.5 percent of nonwhite women who had earnings were private household workers, while only 5.6 percent of white women were. So it appears that most of the earnings disparities between white and nonwhite women could be closed with an occupational redistribution.

Performing the same kind of adjustment for women that has already been described in the case of men, we find support for the above statement. With the occupational adjustment, the nonwhite to white ratio of median earnings for females improves from about 69 percent to about 99 percent. The adjustment puts the ratio above unity for the lower half of the distribution (averaging about 108 percent) and close to unity in the upper half (averaging about 97 percent). Only at the top of the last decile does the adjustment yield little or no improvement. See Fig. 23. Differences in the distribution among major occupations, then, account for nearly all of the disparities for women, except at the highest income percentiles.

Table 2

EARNINGS FOR FEMALES WHO HAD EARNINGS, 1967, BY OCCUPATION GROUP OF LONGEST JOB^a

Occupation Group	Medians		Means		Proportions ^b	
	W	NW	W	NW	W	NW
Professional, technical and kindred	\$4481	5148	4513	4941	.141	.088
Clerical and kindred	3362	3014	3252	3026	.338	.164
Sales workers	1335	1980	1791	2166	.078	.023
Operatives and kindred	2785	2384	2709	2319	.153	.174
Private household workers	371	821	636	1012	.056	.235
Service workers, except private household	1335	1844	1749	2037	.154	.227
Farm laborers and foremen	398	325	693	390	.013	.051
Total	\$2461	1694	2863	2209	1.000	1.000
Total for year-round full-time	4279	3258	4457	3454		.775

Notes:

^a12.9 percent of women who had earnings in 1967 were nonwhite.

^bProportions for occupations are proportion of earners who belong to that occupation group.

Fig. 23—Earnings for females in 1967, with adjustment for (7-class) occupational categories

THE DISTRIBUTION OF SCHOOLING

The distance between nonwhite or Negro and white median years of schooling for those 25 years and older has been decreasing in recent years, but it is still sizable: in 1967 the median was 12.2 for white and 9.4 for Negro men. For 25 to 29 year olds the gap at the median appears by 1967 to have almost vanished. It was 12.6 for whites and 12.2 for Negroes.

However, as in the case of income, so with years of schooling, the use of medians alone can be deceptive. The distributions of schooling remain very different; even for 25 to 29 year olds it appears that while the medians are very close all this means is that most non-whites as well as whites finish high school.* However, in the upper half of the distribution of whites, much larger numbers go on to graduate school or at least graduate from college. In the case of men aged 25 to 29, 75.5 percent of whites and 58.1 of blacks had completed 12 or more years of schooling; the proportions that had completed 13 or more years are only 34.3 percent and 14.5 percent respectively. Among those who completed high school then, a much smaller proportion of blacks than whites received any additional schooling. The higher black dropout rate occurs at all schooling levels. The proportions that completed 16 or more years of schooling were 19.1 percent and 5.3 percent, and for 17 or more years they were 7.9 percent and 1.0 percent.

While the difference in years of schooling completed at the 50th percentile (the median) is only .4 years, the difference at the 80th percentile is 2.8 years (12.9 and 15.7 years for blacks and whites respectively). And even for the lower end, the differences are all

*Years of schooling are recorded in integer values only. But it is assumed that all of those reported as having completed 12 years of schooling, for example, are uniformly distributed between 12.0 and 12.9. A median of 12.2, then, means that the 50th percentile is .2 of the distance between the percentiles for those with less than 12 years of schooling and those with 12 or less years.

larger than .4. For example, at the 20th percentile the difference is 1.5 years (9.6 and 11.1 years respectively).*

Increased schooling (a) is clearly useful for raising nonwhite dollar income in absolute terms and (b) is plausible for increasing the overall relative income of the nonwhite working population compared with whites. But (c) the income of nonwhites with a given level of schooling need not thereby rise compared with the income of whites with an equal number of years of schooling. (d) In fact it is commonplace in the literature to suggest that as nonwhites become better educated (or at least acquire more years of formal schooling), they increasingly find themselves with lower relative income than whites of equal education (or at any rate the same number of years of schooling). In this sense, nonwhite "relative poverty" might be expected to worsen as nonwhites catch up with whites in schooling and even as the nonwhite population as a whole gains on whites in income.

MARGINAL RETURNS TO SCHOOLING FOR WHITES AND NONWHITES

Several studies indicate that nonwhite marginal returns to extra years of schooling are smaller than white.** These studies are only in part comparable. Some measure "returns" as increased occupational status as in Blau and Duncan, or earnings as in Hanoch and in Herman Miller, or a reduced index of occupational dissimilarity between nonwhites and whites as in both Hare and Siegel, or total money income as in S. M. Miller and Roby, or money wages and salaries as in Zeman. The categories used of years of schooling cannot be exactly matched, and graduation years plainly contrast in importance to adjacent years when dropouts occur. Beyond high school, in some of these studies

* We use differences at percentiles rather than ratios of proportions for reasons similar to those discussed in Section III on the limitations of such proportions for measuring income differences.

** Blau and Duncan, 1967, Chapter 6, pp. 207-241; Duncan and Duncan, n.d.; Hanoch, 1965 and 1967, pp. 310-329; Hare, 1962, pp. 118-119; Miller, 1966, Chapter 6, pp. 123-167; Miller and Roby, 1968 (see also Miller and Roby, 1967, pp. 16-52); Siegel, 1965, pp. 41-57; and Zeman, 1955.

the data permit only the category "13 or more years of schooling"; in other studies "13 to 15" and "16 years and over." In still others, graduate level education is separable in a category of 17 years and over. Finally, these studies refer to different points in time: Zeman to 1939, Hanoch to 1959, Hare to 1939 and 1949, and so on. Nonetheless they appear to agree in finding that returns, variously measured, increase with increasing years of schooling less for nonwhites than for whites, generally through the level of one or more years of college. At least a few commentators have taken this apparent relative decline with increased schooling as arguing against the current stress on formal education for nonwhites.

But first it should be noted that if education were more evenly distributed as between whites and nonwhites, such an income decline relative to whites with the same years of schooling, as schooling increases, would nonetheless go along with a very sizable increase not only in the absolute dollar income of nonwhites but also in the relative income of the nonwhite population as a whole.

Second, a decline in the nonwhite to white income ratios with increasing levels of formal schooling might in good part be accounted for by the relatively small investment made in on-the-job training for nonwhites. This would argue not against increased schooling for nonwhites, but in favor of following investments in increased formal schooling, as in the case of whites, with a larger investment in on-the-job training, enabling nonwhites to make better use of their schooling. Mincer estimates that for a nonwhite man with college level education in 1949, investment in formal schooling averaged \$13,200, and investment in on-the-job training came to \$7,870.* The corresponding per capita investments for all men in the United States were \$15,900 and \$24,300, about 1/5 higher in the case of schooling and more than three times as high for on-the-job training. Mincer's estimates very likely overstate nonwhite to white differences in

* Mincer, 1962.

on-the-job training.* Nonetheless the differences are surely substantial, and reducing these differences will complement a relative improvement in nonwhite formal schooling. The returns to the latter will be higher if these joint effects are not ignored.

Third, it should be observed that none of the studies cited show that the relative marginal returns to nonwhites decrease steadily with higher education. For example, Hanoch, whose inquiry on earnings and schooling is the most elaborate and carefully qualified, shows a much higher relative increment for nonwhites than for whites at the graduate level (17 years of schooling and over). Miller's data show some increased marginal return at 17 or more years of schooling for the 18 to 64 year olds (the nonwhite to white earnings ratios were .576 for 5 years or more of college as distinct from .521 for 4 years) and this is even clearer for the 35 to 44 year olds (where the ratios are .612 by comparison with .527).** Hare found college graduates less dissimilar than college students and college students less than high school graduates. The largest marginal change in Siegel's occupational distributions was a sharp decrease in dissimilarity between those with 3 years of college and those with 4 years or more. Blau

*Mincer's model, like some other human resources models, does not escape the problems of inadequate standardization involved, for example, in the use of years of schooling as a surrogate for education. Such models attribute differences in earnings of persons of the same age and sex with the same number of years of schooling to differences in "experience." But these lower returns to "experience" actually reflect also lower quality of schooling, less relevant curricula, and a good deal else. "Experience" here is a catch-all for many factors that cause nonwhite income to be lower in each age and year of schooling class.

Investment in training or experience defined in this context is measured by capitalizing earnings forgone. In the past it would be lower for nonwhites even if they had experienced the same physical and social processes of training and learning by doing as whites, since nonwhites would have forgone less. That is, their alternative earnings are generally poorer in each age, sex, and schooling class. To use differences in investment so defined to explain income disparities between nonwhites and whites of the same age, sex, and schooling (as some have done) is then circular. On the other hand, while the physical investment in training and experience is hard to measure directly, it is clear that it has been very substantially less for nonwhites than for whites.

**Miller, 1966, Table VI-3.

and Duncan suggest that though there is a marginal decline in relative occupational status for nonwhites with increasing education, their educational investment does begin to pay off with graduate studies.

Fourth, the gross figures for the population 25 years or over confound the difference between returns to education for given population cohorts of whites and nonwhites and differences due to an increased weight for nonwhites by comparison with whites of the younger cohorts. The more educated nonwhites are, on the average, at an early phase of their lifetime earnings cycle. They are farther from their peak income than the whites. The figures presented here do not correct for this.

Fifth, with notable exceptions, such as the studies of Hanoch and Mincer, most of the inquiries cited have looked at the gross relative returns to schooling without any explicit consideration of costs. But both direct costs such as tuition, and indirect opportunity costs in the form of earnings forgone or postponed during the years of schooling, appear to be lower for nonwhites. The relevant cost data are scarce, and they are extremely hard to estimate. Yet they have a quite critical influence on computations of private net internal rates of return. Hanoch emphasizes that his estimates of the marginal internal rates are most sensitive to errors in the rather arbitrarily estimated initial segments of his age profiles of earnings.* Such estimates for nonwhites are particularly doubtful.**

Sixth, the earnings forgone, left out of the gross figures on marginal returns to schooling, can be expected to affect the college and graduate level especially. It is only in the last years of high school, in college, or graduate school that either whites or nonwhites

* Hanoch, 1965, pp. 71 and 84.

** Hanoch makes clear that his estimated rates of return don't take account of "expected secular growth in incomes,... improvements over time in productivity and in the quality of schooling,... cyclical variations in earnings,... expected changes in relative supply and demand of various skills,... the progressive taxation of earnings, and... differences in the cost of living," Hanoch, 1967, p. 324. Several of these omissions may strongly bias the comparisons between nonwhites and whites.

have earnings to forgo, and one might expect the difference between nonwhite and white forgone earnings to increase with an increase in schooling. Therefore not only do gross returns to schooling in general understate net returns of nonwhites compared with whites, but the bias very probably increases with increasing years of schooling.

Seventh, even reliably estimated net private money returns would not be decisive either for an individual or for public choice. For the individual the financial investment model of education only catches some of its major values; education is also a consumer good that may be directly enjoyed; and it offers positions in society that may be valued variously by different individuals and different ethnic groups at a given time. Moreover, a more nearly even distribution of education between whites and nonwhites has social as well as private returns.

None of the foregoing comments, moreover, take into account all the relevant variations in quality and content of schooling, and other inadequacies of our controls.

Finally, it appears that the gross returns to schooling are changing rapidly and it is not safe to generalize from a few years. Using a single year, say a decennial census date or a recent Current Population Survey year, is particularly hazardous. For example, comparing 1966 and 1967, using three categories for years of schooling, there were improvements for males at all levels, but particularly at the college level. The nonwhite-to-white ratios of median income in 1966 were .705, .701, and .653 for the elementary, high school, and college levels respectively, and in 1967 the corresponding figures were .734, .712, and .751. The improvement at the college level was statistically significant considering sampling errors, but the others were not. However, this is an important matter because it has been suggested that returns were small at the college level for nonwhite men compared with white men. For both years the ratio for all males 25 and over (.574 in 1966, .604 in 1967) was lower than for each of the three component classes because of the larger proportion of nonwhites in the lower educational groups and the higher proportion of whites in the higher educational classes. About 47 percent of nonwhite males in

1967 had only elementary school training whereas only about 28 percent of white males were at this level. The college level includes about 25 percent of whites and only 12 percent of nonwhites.

Finer breakdowns of income by years of schooling completed in 1967 show that the nonwhite to white ratio of median incomes for men is not a monotonic function of years of schooling, although more often than not the ratio does decline with increasing years of schooling. There is improvement in the ratio with the 12th year of schooling, and again for 13 to 15 years of schooling, but the marginal change in the ratio is negative for all of the other schooling categories. See Table 3. The marginal changes between adjacent categories are not statistically significant for any, but fitting a straight line to these data results in a negative coefficient for years of schooling. However, this fit is also not statistically significant, so that it is not possible to make any strong statement about the relative marginal returns to schooling at the median for white and nonwhite men.*

Inferences about marginal returns to schooling, however, are usually based on mean incomes rather than medians. For the data points available, the ratio of nonwhite to white mean incomes declined steadily with increased schooling. Again, see Table 3. Fitting these data to a straight line results in a negative coefficient for years of schooling, and a much better fit than in the case of medians.**

Straight line fits on income by years of schooling are not warranted, since a year of schooling is not a uniform unit. The 8th, 12th, and 16th years are graduation years and are thus critical points.

*The resulting regression equation is $Y = .8125 - .0052X$ where X = years of schooling for males in 1967, and Y = the nonwhite to white ratio of median incomes. But under the null hypothesis that the coefficient is 0, a value this extreme in either direction could be expected to occur 50 percent of the time, so that this fit is not a very good one. $R^2 = .355$.

**The resulting regression equation is $Y = .8402 - .0105X$, where X = years of schooling for males in 1967, and Y = the nonwhite to white ratio of mean incomes. Under the null hypothesis that the coefficient is 0, a value this extreme in either direction could be expected to occur about 7 percent of the time. $R^2 = .868$.

Table 3

MALES 25 AND OVER, 1967, BY YEARS OF SCHOOLING

Years of Schooling	Medians			Means			Marginal Change in Ratio		Proportions	
	Marginal Change in Ratio			Marginal Change in Ratio			W		NW	
	W	NW	NW/W	W	NW	NW/W	W	NW	W	NW
Elementary	\$3936	2889	.734	4533	3269	.721			.283	.473
High School	7047	5015	.712	7352	5047	.686	-.022		.470	.410
College	9463	7110	.751	10792	7271	.674	.039		.247	.117
Less than 8	3118	2570	.824	3758	3073	.818			.139	.372
8	4881	3711	.760	5278	3992	.756	-.064		.144	.101
9 to 11	6408	4545	.709	6558	4627	.706	-.051		.166	.203
12	7378	5427	.736	7787	5461	.701	.027		.303	.207
13 to 15	8299	6418	.773	8994	6267	.697	.037		.104	.057
16 or more	10740	7868	.733	12089	8223	.680	-.040		.144	.060
Total	\$6732	4064	.604	7404	4467	.603				

The marginal income returns for these particular years should be expected to be higher than for other years. A straight line fit simply averages everything out and thus cannot give an accurate picture of relative white and nonwhite marginal returns to additional years of schooling. Using the nonwhite to white ratios in the regression fit at least handles the problem of the nonuniformity of years of schooling, and the fit on ratios of mean incomes indicates that nonwhite and white marginal returns to schooling follow different patterns -- that is, that nonwhites have a lower marginal return to additional years of schooling. The differences in the fits for medians and for means suggest the importance of looking at income distributions.

THE EFFECTS OF RELATIVE INCREASES IN YEARS OF SCHOOLING FOR NONWHITE
MEN

In estimating the effects of differences in nonwhite and white years of schooling completed on the relative income standing of nonwhites, we perform an adjustment analogous to that used for major occupations as follows: we use current nonwhite income levels within each of the six categories of years of schooling but change the weights given to each. The new weights given to nonwhite incomes are the current proportions of whites in each year of schooling category. The result is then an income distribution determined by white schooling levels but nonwhite returns for each level of schooling; that is, we have adjusted nonwhite income for the differences in the number of years of schooling completed by whites and nonwhites. This adjustment shows that the nonwhite to white income ratios for men improve more for the low and middle income percentiles than for the high income percentiles. The average improvement in the nonwhite to white income ratio for the lower half of the distribution is about 17 percentage points while the average improvement in the upper half of the distribution is a more modest 10 percentage points. See Fig. 24. This suggests again the particular difficulty nonwhites have in getting high incomes, even when years of schooling have been equalized. It should be pointed out here, as can be seen in Fig. 24, that the ratios are still substantially below 100 percent after the adjustment. The

Fig.24—Total money income to males 25 and over in 1967,
with adjustment for years of schooling completed

average proportion of the ratio disparity closed by the adjustment for years of schooling for men is roughly the same as in the case of the adjustment for occupations, about one third.

Relative income by schooling categories improved between 1967 and 1968, although not as dramatically as between 1966 and 1967. The largest change in the Negro to white ratio of median incomes for men occurred for the 13 to 15 years of schooling group, with the ratio increasing from .747 in 1967 to .808 in 1968. There was also a large improvement for those with 8 years of schooling from .765 to .822. The ratio was more stable for the other schooling categories. But perhaps the most important change was in the distribution among the different levels of schooling. The number of black men 25 years old and over with four or more years of college increased from 162,000 in 1967 to 217,000 in 1968, an increase of about 34 percent in one year. The corresponding increase in the number of white men with four or more years of college was only 2 percent. And looking back at the number of blacks now in college, we find that the number increased by 85 percent between 1964 and 1968. This change will not show up in the income figures for those 25 and over for several years yet.

The changes from 1967 to 1968 in the nonwhite to white ratios of median incomes for men by schooling categories resemble those for the Negro to white ratios, except at the college level. The nonwhite to white ratio for all men with one or more years of college hardly changed at all from 1967 to 1968, going from .751 to .753, but it did confirm the large change from 1966 to 1967. Moreover, the corresponding Negro to white ratio improved from .691 in 1967 to .731 in 1968. The increase in the total of all nonwhite men 25 and over with four or more years of college was about half that for black men, 18 percent compared with 34 percent. The number of nonwhite men with one or more years of college increased by 74,000 in that one year, and about 65,000, or 88 percent, of those were Negroes. This is a higher percentage of Negroes among nonwhites at the college level than in previous years.

EFFECTS OF RELATIVE INCREASE IN YEARS OF SCHOOLING FOR NONWHITE WOMEN

In the case of women, in 1966 we find that the nonwhite to white ratios of median incomes improve with additional years of schooling. The same trend is present for 1967. There is improvement from 1966 to 1967 in the ratios for both the elementary and high school levels, but the ratio for the college level, although above 100 percent for both years, declines slightly for 1967. The ratios for 1966 were .803, .850, and 1.126 for the elementary, high school, and college levels respectively. And the corresponding ratios for 1967 were .865, .922, and 1.097. Finer breakdowns on the years of schooling categories for 1967 show improvement in the ratios with additional years of schooling with the exception of the 12th year of schooling. See Table 4. Fitting straight lines to these data for women results in better fits than for men for both medians and means. The regression coefficient for years of schooling is positive for women, indicating a larger (proportional) marginal return to schooling for nonwhite women than for white women.*

Using an adjustment on the nonwhite income distribution for women similar to that used for men, we find that for the lower half of the distribution the ratios improve by an average of 22 percentage points, which puts the average ratio above unity in the lower half of the distribution. However, in the upper half of the distribution the adjusted ratios are again higher, by about 16 percentage points, than the unadjusted ratios, but they average about 93 percent. See Fig. 25. We find, therefore, that an adjustment for years of schooling brings about a much greater improvement in the income ratios for women than for men, although in both cases the improvement is considerably greater for the lower income levels than for the higher ones.

* The resulting regression equations are $Y = .8324 + .0136X$, where X = years of schooling for females in 1967, and Y = the nonwhite to white ratio of median incomes, and $Z = .7593 + .0129X$, where X is as above and Z = the nonwhite to white ratio of mean incomes. Using a 0 coefficient as the null hypothesis for both fits, a value as extreme as the first could be expected to occur about 10 percent of the time, but less than 1 percent of the time for the second fit (on ratios of means). The R^2 s are respectively .822 and .972.

Table 4

FEMALES 25 AND OVER, 1967, BY YEARS OF SCHOOLING

Years of Schooling	Medians			Means			Marginal Change in Ratio		Proportions	
	W	NW	NW/W	W	NW	NW/W	W	NW	W	NW
Elementary	\$1250	1081	.865	1839	1446	.786			.277	.444
High School	2543	2345	.922	2963	2584	.872	.057	.086	.527	.444
College	3898	4275	1.097	4496	4377	.974	.175	.102	.196	.112
Less than 8	1121	989	.882	1640	1324	.807			.132	.319
8	1385	1332	.962	2021	1757	.869	.080	.062	.145	.125
9 to 11	2043	2028	.993	2546	2242	.881	.031	.012	.173	.226
12	2924	2782	.951	3167	2939	.928	-.042	.047	.354	.218
13 to 15	3082	3089	1.002	3732	3454	.926	.051	-.002	.100	.053
16 or more	5126	5594	1.091	5300	5192	.980	.089	.054	.095	.060
Total	\$2178	1700	.781	2952	2281	.773

Fig. 25—Total money income to females 25 and over in 1967, with adjustment for years of schooling completed

So, for both occupational differences and years of schooling, we find nearly all of the income disparity accounted for in the case of women, while for men each factor separately accounts for roughly a third of the income disparity. Since years of schooling have a substantial influence on the occupational distribution, the two factors do overlap, so that the joint effect would not be a sum of the two. We are now in the process of analyzing data for 1966 from the Survey of Economic Opportunity and tapes for 1966 and 1968 from the CPS. These data, which have recently become available (in particular the CPS tapes), permit us to take account of the joint effect of occupation, schooling, age, and other variables on the entire income distributions of whites and nonwhites.

CONCLUDING COMMENTS ON SCHOOLING AND JOBS AND THE INCOME RATIOS AT HIGHER QUANTILES

Nonwhite relative income would be raised very substantially if we equalized years of schooling between the races even if the quality and content of schooling were unaltered. And the same goes for equalizing the distribution of nonwhites and whites among the major occupations, even if the distributions of detailed occupations were not improved and there were no improvement in nonwhite to white income ratios within occupations. But each of these changes would leave most of the present gap unclosed and would help the lower more than the upper half of the nonwhite distribution. The top quantiles would show little relative improvement.

Nonwhite to white income ratios tend to be lower for the higher categories of years of schooling and for the higher paid occupations, though we have seen that these tendencies are not uniform and moreover appear to be changing in recent years. Where nonwhite to white income does decline with increased schooling or increased occupational status, there are at least two ways of looking at the phenomenon.

First, barriers to entry and promotion may be higher at these higher reaches of society. Prejudice, as many have noted, may be particularly strong against admitting nonwhites to positions involving

supervision or authoritative decision or high prestige. Whatever its quantitative extent, it is plausible that something like this phenomenon has been at work.

A second way of looking at it is connected, although not identical, with our earlier comments on unexplained residuals and the inadequacies in our standardization of the factors we use in explaining income disparities. Here we would observe that the shaky equivalence of "same years of schooling" and "same education," and the shaky equation of "same census occupation" with "same line of work," get even shakier with increased years of schooling and increasingly high paid categories of occupation.

Take education, and consider first educational "quality." There has been much controversy since the Coleman report on Equality of Educational Opportunity about the effects of school quality on scholastic achievement. We don't propose to enter the lists in that battle. However, it is worth observing that a recent analysis by Alex Mood of the data gathered for the report shows that the proportion of the variance in achievement between schools associated with indexes of school quality and peer quality increases with increasing grades of school through the 12th grade.* Mood's concern is to point out that most of the variance removed can be associated with either the peer or school characteristics and that essentially all of the school effect can be associated with the index of teacher quality. For our own purposes, the fact that the squared correlation coefficients generally increase with increased schooling -- that is, that an increased proportion of the variance (the total variance in achievement being almost constant over years of schooling) is associated with either peer quality or teacher quality or other school effects -- is of particular interest. For it suggests that the higher the number of years of schooling the less reliable are "years of schooling" as a measure of "education" or as a predictor of scholastic achievement.

*Mood, 1969, Tables 1 and 2.

All of Mood's data refer to general education in the elementary and secondary schools. Higher education poses larger conceptual problems for measuring quality and achievement. On these grounds alone one would suspect the standardization implied in "same years of schooling" to be more doubtful for college and graduate schools.

In fact, while the content of the curriculum in the lower schools may for many practical purposes be taken as one among many aspects of "school quality" to be covered by a single index, this makes less sense at the college level or above. Education increases in differentiation as one goes from grade school to graduate school. Reading, writing, and arithmetic vary between regions, but they are being taught in grade schools in all regions, and nationwide scholastic achievement tests are feasible in principle. It is hard to think of a sensible, common measure or standardized achievement test for the progress of art historians and dentists. It strains usage to identify Fine Arts or English Lit or Classics as taught at Harvard as of a lower "quality" than Engineering or Business Administration or Medicine at the same institution. (It may strain Harvard usage especially.) Nonetheless, engineers, doctors, and business majors may in general make more money. For explaining disparities in income, "years of schooling," taken without qualification, is likely to lose explanatory force more or less steadily with the increasing level and differentiation of education.

Something like the forgoing comments about schooling at higher levels might apply to an increased shakiness in equating "same census occupational category" and "same line of work" for the higher paying categories. Within major occupational groups nonwhites are in detailed occupations that require less training and skill and "for this reason their earnings as well as earnings of the white incumbents of those (detailed) occupations will be low."* Moreover, the low paid work of the laborer or the household service worker seem much less differentiated than the highly varied skills of the professionals and managers. There is some evidence that there is a greater income variability

*Taeuber, Taeuber and Cain, 1966, p. 274.

among professional (and especially independent professional) than among nonprofessional workers,^{*} but our own preliminary analysis of recent income data (along with a new measure of internal inequality)^{**} suggest that this may not be so. Whether or not the income of professionals has a wider spread, their precise lines of work do.

The inadequacies in standardization of the education and occupation variables appear then to make for understating the gains that might result from a more even distribution of nonwhites and whites among jobs and schooling categories. The increased differentiation of schooling and work at higher levels, however, has some implications for policy: Attempts to reduce the income disparity along the entire income distribution might aim more precisely at the kinds of formal and informal education and training best calculated to prepare

^{*} See Friedman and Kuznets, 1956, especially pp. 71 ff. and p. 390. "...the evidence presented, while certainly insufficient to demonstrate that the incomes of independent professional men are more variable than those of any other occupational group, does seem to warrant the conclusion that earnings from independent professional practice display greater relative variability than earnings from all pursuits combined and probably than earnings from most other pursuits taken separately. A similar but more equivocal conclusion is probably justified about the earnings of all professional workers, salaried and independent." p. 80.

^{**} We form the ratios of "income to professionals" to "income for the total of all occupations" at corresponding percentiles of the distribution in a manner exactly analogous to the method used to obtain the nonwhite to white income ratios. An increasing slope in this curve indicates greater inequality in the numerator group, and a decreasing slope (as was observed in the above example) indicates less inequality in the numerator group. This is easier to see in the case of a year-to-year income ratio curve. Letting the later year be the numerator, a decreasing slope would indicate that the lower percentiles had increased their income by a larger percentage than the higher percentiles, meaning less inequality in the later year. And vice versa for an increasing slope. (This direct measure of relative internal inequality between two distributions is used extensively in the part of our study not summarized in this paper for OEO.)

The income intervals in the published data used are not very well chosen for revealing inequalities in the top half of the distribution of high income occupations such as professionals, and especially for self-employed professionals. We hope to be able to obtain more appropriate data for this purpose from CPS tapes.

nonwhites for a substantially higher paying range of occupations. And, so far as jobs are concerned, private as well as governmental efforts need to focus not simply on entry level jobs capable of barely lifting nonwhites out of poverty, but on increased representation in those detailed occupations that might give them an even chance with whites for middle and higher incomes. It may be rather hard to apply fair employment practice laws to promotions for merit within a given line of work. But the more narrowly defined an occupation, the less troubling this may be and the more precisely the nonwhites may aim and prepare to earn higher incomes. This does not eliminate the problem of prejudice against nonwhites in supervisory jobs but it may circumscribe it somewhat.

Finally, we have stressed that the tendency for nonwhite to white income ratios to decline with higher categories of years of schooling has not in the past been uniform. And it appears now to be in the process of change. Hanoach, for example, believes that the reversal at the graduate level of the relative decline in his estimated nonwhite marginal returns to years of schooling may be quite meaningful in spite of all the uncertainties of the estimates. And we suspect he is right, given the analogous improvements at higher levels found in a number of independent studies.*

We might conjecture several explanations for such an improvement at the graduate level in past decennial census years. First, it is possible that nonwhite graduate schooling, much more than schooling at the college level or below, took place at predominantly white schools. Up to recently, no all-Negro college awarded Ph.D.s', most did not confer any graduate degrees or had been doing so only for a short while, or had been offering graduate as well as undergraduate training in a range of professions with relatively low prospects for lifetime earnings. (This could be so partly because they were professions servicing the low income Negro community or because they were professions that in general paid less.) Assuming this were so:

* See above pp. 81 and 82.

(1) It would have implications not only for the content but for the quality of the schooling (the teachers and the facilities) and for a good deal else that may be linked to higher income. The quality of graduate training would have been much closer to that of whites than the quality of undergraduate training.

(2) The improved quality of classroom work would be reinforced by the prior training of the other students who presumably will have come from better colleges. This would help provide some informal learning as well as a taste of the competition with whites to be faced later in jobs.

(3) Such predominantly white graduate schools could establish a lot of the connections and information networks useful in obtaining work in more highly paid occupations later.

The road at least to top incomes, W. Arthur Lewis has suggested, runs through a rather select list of white majority schools.

Scientists, research workers, engineers, accountants, lawyers, financial administrators, Presidential advisers -- all these people are recruited from the university. And indeed nearly all of the top people are taken from a very small number of colleges -- from not more than some 50 or 60 of the 2,000 degree-granting institutions in the United States. The Afro-American could not make it to the top so long as he was effectively excluded from this small number of select institutions. The break-through of the Afro-American into these colleges is therefore absolutely fundamental to the larger economic strategy of black power.*

Lewis does not mean of course that top incomes should be the sole target. In fact, he suggests, entry into training programs in the building and printing and publishing industries and others is essential if there are to be relative improvements in the middle range.

The schooling and training of nonwhites in recent years has been changing in content and quality as well as amount. Estimates of the return to further increases in schooling and training need to take these changes into account. Even more, the social return to increased investment in nonwhite schooling and post-school training and to the

* Lewis, 1969.

occupational redistribution of nonwhites depends on the appropriate aims of policy -- simply to keep unemployment rates low or to reduce the number below a fixed or changing poverty line, or also to even the chances of nonwhites and whites to obtain middle and high income.

V. SUMMARY AND CONCLUSIONS

1. From the 1966, 1967, and 1968 data, the most powerful conclusion to be drawn is that nonwhite family and personal incomes are much inferior to white incomes along the entire distributions of each. It is not simply a matter of the middle of the distribution. Still less is the trouble confined to the low ends. The differences are pervasive and they are displayed most sharply in the existence of upper limits that tend to bound nonwhite personal income.

2. "Inequality" among nonwhites, measured in standard ways, is not much different from "inequality" among whites. In the case of families, nonwhite income is slightly more unequal. Nonwhite income to persons is slightly less unequal.

3. Nonwhite income is cyclically more unstable than white. But theory suggests that tight labor markets, like slack ones, have persistent effects; and in fact lasting gains have been made, especially during the very tight labor markets of World War II, Korea, and Vietnam.

4. The ratio of nonwhite to white income to persons did not return to prewar troughs after World War II and Korea, but it did decline with the loosening of the labor market. After Vietnam, it may do so once more, unless a well-aimed and executed policy prevents it.

5. Nonwhite family income has grown relatively faster than white income since before World War II and since the end of it. At the median, nonwhite family income has increased about a third more rapidly since 1947; and nonwhite income to persons twice as fast as white since 1948 -- the starting year for continuous (unpublished) annual data on income to persons.

6. Nonetheless, even at these rates, convergence would take place only in a distant future -- even for median income to persons at some time near the end of the century.

7. Relative gains over time have been largest at the low end of the distribution. In fact, compared with white, there has been little or no change in nonwhite income at the top.

8. This conclusion is emphasized if one takes into account the sizable differences in the current age structure of nonwhite and white populations and in their relative changes over time. Some of the income difference in the lower percentiles is accounted for by the larger proportion of young people among nonwhites. And, since this age difference has increased in the postwar years, the improvements at the bottom end are larger when income is controlled for age. On the other hand, the fact that such age adjustments do not significantly affect the middle and upper end of the distribution confirms the hypothesis that nonwhites get much lower money returns to increasing age and experience.

9. Adjusting nonwhite earnings for differences in distribution among major occupations improves the nonwhite to white income ratios for both men and women. For men it removes about a third of the disparity on the average throughout the distribution and almost half the disparity in the lowest fifth. For women, where the disparity is smaller, it is erased altogether in the lower half of the distribution. (In fact, the ratio is greater than unity there.) It does less in the high end of the distribution for women as well as for men. Nonetheless, the ratio at the high end for women is close to unity except in the last decile, the top of which is almost unaffected by the occupational adjustment.

10. Adjustments for differences in years of schooling show much the same character: for men, they eliminate about a third of the disparity on the average, less than this at the upper and more at the lower half. In the case of women they put the ratio well above unity for the lower half of the distribution and slightly below it for the top half. Both the occupational and the schooling adjustments exhibit the particular difficulty nonwhites have in receiving high income.

11. Equality in years of schooling, or jobs in the same broad occupational category, only very crudely approximate identities in education or line of work. A substantial part of race income disparities, variously measured, may be associated with a few such coarse variables by simple linear or log-linear rules. Not surprisingly, this generally is not so for a still larger fraction of the disparity, however defined. Models that try to use the disparity unexplained by such relationships to separate precisely the effects of present from past discrimination

have in general the same logical structure and the same defects as those that take the unexplained disparity as genetic and possibly immutable. In one case the unexplained residuals are attributed to present race discrimination in the marketplace and in the other to race inferiority. But these residuals plainly have a great deal to do with inadequacies in the standardization of the variables, with factors left out, and with differences between the nonlinearities in reality and the simple relations assumed in the models.

12. Some related though distinct comments apply to generalizations about nonwhite relative returns to extra years of schooling. In past decennial census years, several inquiries have found that nonwhite marginal returns appear generally, though not steadily, to decrease relative to white returns with increased years of schooling. However, it appears that the inadequate standardizations involved in equating years of schooling or broad job categories become even less adequate as schooling and skill levels increase. This increased differentiation of higher education and higher level skills (as well as prejudice against putting nonwhites in authoritative, supervisory or decision-making positions) may account for the behavior of the earlier census data, and also might help to explain why in these past studies relative returns to schooling, after a decline, turn and increase at the graduate level. For at the graduate level nonwhites in the past more frequently obtained their training in white schools. Graduate schools also tend to train people for professional rather than supervisory careers.

13. These relations are changing, and for recent years we find quite weak any decreasing trend in gross relative marginal returns for nonwhite men. But even if the returns to schooling were smaller for nonwhites, this would not imply that more schooling is unimportant for either the relative or the absolute income of the nonwhite population as a whole. The returns to schooling for nonwhites, whether smaller or larger than for whites, are nonetheless positive; and nonwhites are less schooled than whites. Equalizing the schooling distribution (as stated in point 10 above) closes the average income gap by about one-third. In

the case of women it appears that nonwhite marginal returns are higher than white.

14. Some final comments on implications for policy: These comments are based on a larger study of which this monograph is a part. A good many aims of policy that are loosely connected with the problem of race differences in income have been confounded with it: reducing inequality in society as a whole, poverty, unemployment, ghetto riots, among others. These are all worthy or plausible goals but they are not the same goals.

(a) Eliminating the differences in income between whites and nonwhites need not affect inequality in society as a whole. In fact, if nonwhite men were given the same level and distribution of income as white, this would in recent years have increased inequality (measured by the relative standard deviation or the variance of the natural logarithms) for the aggregate of whites and nonwhites.

(b) Although nonwhites are disproportionately poor, two-thirds of nonwhites are not poor, and most poor are white.

(c) If nonwhite unemployment rates were the same as those for whites, this would help some specific categories of nonwhites (teenagers and women especially) but would have very little direct effect on nonwhite income in the aggregate. In 1966 it would have increased it by less than 2 percent. On the other hand, of the 60% increase needed to close the gap, nearly half would be achieved if nonwhites were distributed among the major job categories in the same proportion as whites. And, even if there was no change in occupational distribution, more than half of the gap would be closed if nonwhites received the same rate of pay in each occupational category.

(d) Such a convergence of the income distributions of nonwhites with whites can be justified on grounds of equity. However, it has quite uncertain relations to the problem of reducing the incidence of riots and of increasing public order in the short run. The unsophisticated views that men riot because they are poor or getting poorer are plainly inadequate, but the more sophisticated and paradoxical theories that men riot because things are getting better are not much more persuasive as generalizations. Past and present theories of "relative deprivation" specify in advance too little about the reference group taken as

standard to be proved wrong; or to provide much information about the effects on public tranquility of future decreases in the disparity in rewards to nonwhites and whites. Grounds of equity are quite adequate and offer the most persuasive justification for reducing race differences in income.

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