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Volume Title: Income Inequality: Regional Analyses within a Human Capital Framework

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Volume Publisher: NBER

Volume ISBN: 0-870-14264-X

Volume URL: <http://www.nber.org/books/chis74-1>

Publication Date: 1974

Chapter Title: Introduction and Summary

Chapter Author: Barry R. Chiswick

Chapter URL: <http://www.nber.org/chapters/c3669>

Chapter pages in book: (p. 1 - 10)

PART **A**

Introduction



## Introduction and Summary

For a long time there has been substantial interest in the determinants of the distribution of personal income. This interest may arise from a concern with either the effects of that distribution (on such factors as incentives for greater efficiency and income allocation between consumption and investment) or its equity. The purpose of this study is to construct a theoretical framework for analyzing regional differences in the distribution of labor market income, and to apply this framework empirically to several countries.<sup>1</sup> Two dimensions of regional differences are studied—the central tendency (level) and dispersion (inequality) in the distribution of income.<sup>2</sup>

Expressing an interest in the determinants of the distribution of income in 1776, Adam Smith wrote: “The five following are the principal circumstances which, so far as I have been able to observe, make up for a small pecuniary gain in some employments,

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1. For surveys of the literature on regional differences in the distribution of earnings, see Jacob Mincer, “The Distribution of Labor Incomes: A Survey,” *Journal of Economic Literature*, March 1970, pp. 1-26; and Harold Lydall, *The Structure of Earnings*, Oxford, Clarendon Press, 1968, Chapter 2. A nontechnical survey of several dimensions of income distribution in the United States is presented in Council of Economic Advisers, *Economic Report of the President*, 1974, Chapter 5.

2. For an analysis of regional differences in the asymmetry of the distribution of income, see Barry R. Chiswick, “An Interregional Analysis of Schooling and the Skewness of Income,” W. Lee Hansen, ed., *Education, Income, and Human Capital*, New York, NBER, 1970.

and counter-balance a great one in others: first, the agreeableness or disagreeableness of the employments themselves; secondly, the easiness and cheapness, or the difficulty and expense of learning them; thirdly, the constancy or inconstancy of employment in them; fourthly, the small or great trust which must be reposed in those who exercise them; and fifthly, the probability or improbability of success in them.”<sup>3</sup>

Smith’s second point is the basis of “human capital” analysis—and the major focus of this book, which uses differences in years of training and in the rate of return from training to explain differences in the level and inequality of labor market income. Smith’s third point, “the constancy or inconstancy of employment,” is explicitly included in my analysis in Part C.

As in most other empirical research in the social sciences, availability of data influenced the method of analysis adopted and the number and diversity of data sets analyzed in this study. For example, investments in schooling can be measured in either dollars (direct plus opportunity costs) or “time equivalents” (years of schooling completed). Since data on dollar investments in schooling are nearly nonexistent while data on years of schooling completed are available for many regions, my theoretical model and empirical analysis relate income to years of schooling. For similar reasons, investments in postschool training are measured in years of experience (i.e., years since leaving school).

The human capital model I use in my analysis relates the natural logarithm of an individual’s income to his years of training. The level and inequality of income in a region can be related to the distribution of years of training by computing the mean and variance of both sides of the micro-level human capital equation. The measure of “level” is the mean log of income (or the log of the geometric mean), while the measure of “inequality” is the variance of the log of income, a commonly used measure of income inequality.

Although the purpose of this study is to analyze the distribution of labor market income (earnings), some of my analysis deals with money income (i.e., earnings plus nonlabor income) because of data limitations. The terms income and earnings are used interchangeably for labor market income, unless it is clear from the context that total money income rather than labor market income (earnings) is under discussion. Also, because of the measurement problems surrounding years of labor market experience, the

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3. Adam Smith, *The Wealth of Nations*, Book I, Chapter 10, New York, Modern Library, 1937, p. 100.

analysis is restricted to males, who are assumed to have a continuous work history since leaving school.<sup>4</sup> (This assumption would be far less tenable for women.)

## OUTLINE OF THE BOOK

Research reports, whether by economists or others, are written far too often for that small group of colleagues who speak the author's specialized jargon and understand the basic principles underlying his study. The nonspecialist is occasionally awed and more often "turned off." Chapter 2, "A Nontechnical Analysis of the Distribution of Income," is an attempt to bridge this communication gap. It presents an elementary analysis of the distribution of labor market income, much of it quite standard,<sup>5</sup> and the incorporation into this framework of the findings in Parts B and C (the technical parts) of this study. Thus, the "uninitiated" reader is provided with a nontechnical explanation of my analysis, thereby gaining an understanding of its approach and contribution.

In recent years there has been considerable interest in whether or not schooling affects the distribution of income among individuals. Much of the criticism of schooling as a means of improving economic well-being has focused on the allegedly weak link between the distribution of schooling and the distribution of income. The purpose of Part B—Chapters 3 to 5—is to examine explicitly the relation between these two distributions for adult males. In this connection, the analysis is performed on two levels. The first is *within* regions, and is concerned with the extent to which an individual's years of schooling can statistically explain his income. The second is *between* regions, and deals with the extent to which the inequality of schooling and the rate of return from schooling can statistically explain the inequality of income.

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4. The data are for white and nonwhite males. In 1960, 11 per cent of the U.S. male population was nonwhite, 92 per cent of which was black. The proportion of nonblacks among nonwhites varies considerably among the states. For the four major regions, the percentage of nonwhites who are nonblack varies from 1.7 per cent in the South to 52.4 per cent in the West (*U.S. Census of Population: 1960, General Population Characteristics*, Vol. 1, B., Summary, Table 56). Therefore, the census term "nonwhite" is used in this study.

5. What I refer to as the "standard" theory has been developed largely over the last two decades. Gary Becker, Jacob Mincer, and Theodore W. Schultz have been most prominent in its development and dissemination.

The relevant theoretical model is developed in Chapter 3. It predicts that income inequality is larger, the larger the inequality of schooling and the higher the rate of return from schooling. The model is applied empirically in Chapter 4 to the political subdivisions of the United States, Canada, and the Netherlands, and in Chapter 5, to the United States, Canada, Puerto Rico, Mexico, Great Britain, and Israel.

Part C focuses on this question: To what extent and in what manner are state differences in the level and inequality of labor market income of males due to state differences in human capital and employment variables? In searching for answers, it goes beyond Part B's relatively restricted use of the human capital framework, which analyzes earnings merely as a function of schooling. In Part C a broader notion of human capital is employed, incorporating on-the-job experience acquired over time and weeks worked in the survey year as additional determinants of earnings.

The relationships between the distribution of labor market income and that of years of schooling, years of investment in post-school training, rates of return from these investments, and employment during the year are examined.<sup>6</sup> In so doing, this analysis represents a departure from previous regional studies of income distribution, which have tended to rely on ad hoc models. It also departs from previous research by broadening the scope of coverage.

While there has been considerable empirical research on the income distribution of all males and of white males, and on white-nonwhite income differences, a search of the literature reveals little explicit study of regional differences in the level and inequality of labor market income among nonwhites in the United States.<sup>7</sup> Part C of this book, on the other hand, presents an analysis of state differences in the level and inequality of income for all males, white males, and nonwhite males in the United States (including a comparison of the white and nonwhite distributions), and of provincial differences in the level and inequality of income in Canada.

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6. The expanded human capital earnings equation was initially developed by Jacob Mincer in his *Schooling, Experience, and Earnings*, NBER, 1974. Two recent nonregional studies have applied the expanded human capital model to an interoccupation analysis of the level of income and a time series analysis of the inequality of income. See C. M. Rahm, "Investment in Training and the Occupational Structure of Earnings," Ph.D. dissertation, Columbia University, 1971; and B. R. Chiswick and J. Mincer, "Time-Series Changes in Personal Income Inequality in the United States from 1939, with Projections to 1985," *Journal of Political Economy, Supplement*, May-June 1972, pp. S34-S66.

7. One such study is Sharon M. Oster's "Are Black Incomes More Unequally Distributed?," in *American Economist*, Fall 1970, pp. 6-20.

**TABLE 1-1**  
Means and Standard Deviations Across States of the Level  
and Inequality of Income and Earnings for Males

	Income (Y) or Earnings (E)	Av(lnE) or Av(lnY)		Var(lnE) or Var(lnY)	
		Mean	Standard Deviation	Mean	Standard Deviation
United States (51 states)	Y	1.3094	0.2397	0.7867	0.1184
	E	1.2644	0.2132	0.7743	0.1076
Non-South (34 states)	Y	1.3748	0.1356	0.7241	0.0795
	E	1.3530	0.1459	0.7283	0.0902
South (17 states)	Y	1.1786	0.1144	0.9119	0.0758
	E	1.0872	0.2193	0.8662	0.0770

*Note:* Income and earnings are in thousand dollar units. Earnings are for males 14 years of age and older, while income (earnings plus nonlabor income) is for males 25 years of age and older. The District of Columbia is treated as a state.

*Source:* See Appendix A.

The expanded human capital earnings function, which relates an individual's income to his years of schooling, years of labor market experience, and employment during the year, is presented in Chapter 6. This is converted into a relationship to explain regional differences in the level of income in Chapter 7, and in inequality of income, in Chapter 8.

Table 1-1 presents interstate data on the level and inequality of income and earnings of males in the United States.<sup>8</sup> The average log of income (Av(lnY)) and the variance in the log of income (Var(lnY)) are the measures of level and inequality used in this study.<sup>9</sup> The data indicate that there is considerable interstate variability in the level and inequality of income and that, although this variability is reduced, it is not eliminated when separate computations are made for the Southern and non-Southern states.

## SUMMARY OF FINDINGS

This study demonstrates that the distribution of income can be related to investment in human capital. Its theoretical and statistical analyses of personal income distribution among males in

8. See Appendix A for definitions of the income and earnings data.

9. This choice is based on the structure of the human capital model and data availability. Further, the variance of logs is a commonly used measure of inequality.

the United States and several other countries indicate quite strongly that schooling is an important determinant of individual differences in income and of regional differences in its distribution. In addition, postschool training is also found to be an important determinant of income distribution.

Individual differences in years of schooling is an important variable for understanding individual differences in income. The intrastate explanatory power varies considerably, from 17 per cent for Nevada to 51 per cent for Mississippi, with the average value for the states at 29 per cent. This explanatory power is high, considering that individual differences in other variables which influence annual income (e.g., quality of schooling, investment in post-school training, ability, weeks employed, health, pleasantness of the job) are not held constant.<sup>10</sup>

When we look at a model relating income to schooling, income inequality is found to be greater, the higher the rate of return from investment in schooling and the wider the variation in years of schooling in a region. Interstate differences in the rate of return and in schooling inequality by themselves explain 60 per cent of interstate differences in the inequality of income. Income inequality is greater in the Southern states than in the non-South, due partly to (a) greater inequality of schooling, but mainly to (b) a higher rate of return from schooling stemming from the existence of a national labor market for highly educated workers in contrast to the preponderance of local labor markets for those with little schooling.<sup>11</sup>

The schooling model predicts that the strong negative simple correlation between the level of schooling and the inequality of income disappears when the rate of return and inequality of schooling are held constant.

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10. For a fuller analysis of the relation between individual differences in income and schooling, postschool training, and employment, see Jacob Mincer, *Schooling, Experience, and Earnings*, NBER, 1974. For a survey of the literature on this general topic, see Mincer, "The Distribution of Labor Incomes," 1970.

11. Because interstate migration tends to be quite easy for those with high levels of training, there is virtually only one single national (and, in some professions, one international) labor market for their services. Highly trained workers in poorer states receive incomes similar to what they would receive in a wealthier state. This is not true, however, for those with less skill, for whom migration is more difficult. Therefore, less skilled workers are paid wages determined by the local labor market, and these wages are lower in the poorer (lower average income) states. Thus, the per cent increase in income for an extra year of schooling, or the rate of return from schooling, is higher in the poorer (Southern) states.

Our analysis is expanded by adding the distribution of years of postschool experience and weeks of employment during the year to our model. This increases from 60 per cent to 85 per cent the proportion of interstate differences in income inequality which we can explain via our model of income distribution. (The additional variables explain over 60 per cent of the variation in income inequality *not* explained by the rate of return from schooling and by schooling inequality.) If the data are restricted to white males, our analysis explains 92 per cent of interstate differences in income inequality; the comparable analysis for nonwhite males explains 85 per cent. The important variables are the rate of return from schooling, the inequality of schooling, the inequality of weeks worked, and the inequality of age (or experience) except for inequality of age for nonwhite males.

The reason why inequality of age is an unimportant factor in the analysis for nonwhite males lies in the small change in income of older nonwhites as we look at older age groups at a particular moment in time. This change in income is referred to as a cross-sectional "experience-earnings profile." In principle, the observed fairly flat nonwhite profile may stem from several, not mutually exclusive, forces: low investments in postschool training, low rates of return from postschool training, and a more rapid rise over time in the quality of schooling and the quantity of job opportunities for nonwhites compared to whites. Evidence developed in this volume and elsewhere suggests that each of these forces may be operative.

The inequality of annual income within states is smaller among nonwhite males than among white males. Nonwhites, however, show a larger inequality in weeks worked during the year. These two observations imply a smaller inequality in weekly wages within states for nonwhite males than for white males. This is not due to differences in the distribution of years of schooling or of years of experience in the labor market; rather, it is a consequence of the lower rate of return from schooling and the flatter cross-sectional experience-earnings profile.

The schooling model of income inequality is also applied within Canada, within the Netherlands, and across various countries. As was found in the United States, income inequality is larger where the rate of return from schooling and the inequality of schooling are larger. Among the Canadian provinces, the rate of return and schooling inequality by themselves explain 65 per cent of provincial differences in income inequality. This rises to 75 per cent when the distribution of years of experience is added to the analysis. Thus, the distribution of experience explains 30 per cent

of the variation left unexplained by the rate of return and schooling inequality. It is also demonstrated that the model provides a useful framework for interpreting the income distribution effects of historical events (mass migration into Israel), institutional differences (Great Britain versus the United States), and economic growth.

Regional differences in the level of income of male workers are related to differences in the distribution of schooling, age (experience), and employment. Interstate differences in the distribution of schooling and age explain 65 to 70 per cent of interstate differences in the level of earnings of all males and all white males in the United States, but these variables perform less well where income data are used. For nonwhite males, however, schooling and weeks worked account for a high proportion (80 per cent) of interstate differences in the level of income and earnings.<sup>12</sup> Over 80 per cent of white-nonwhite differences in the level of income are due to the smaller number of years of schooling and the smaller number of weeks worked by nonwhites. The model performs very well (95 per cent explanatory power) when we analyze Canadian provincial differences in the level of income.

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12. Weeks worked is not a significant variable for white males because it varies too little across the states, and age is not significant for nonwhite males because of the low slope of the nonwhite experience-earnings profile.