Higher Education and Earnings

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COLLEGE AS AN INVESTMENT AND A SCREENING DEVICE

by Paul Taubman
Professor of Economics
University of Pennsylvania

and Terence Wales
Associate Professor of Economics
University of British Columbia

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Foreword

by Clark Kerr
Chairman, Carnegie Commission on Higher Education

This is the third volume resulting from studies conducted by the National Bureau of Economic Research for the Carnegie Commission. It presents the full report by Taubman and Wales of their detailed analysis of the results of a 1969 follow-up survey of a large sample of men who were accepted for a special Army Air Corps volunteer program in 1943. A brief summary of the findings was also included in the recently published volume of essays edited by Juster (*Education, Income, and Human Behavior*).

The Taubman and Wales study is based on what is in some ways the most valuable source of data that has as yet been available for human-capital analysis. Most earlier studies of the rate of return from education have been based on decennial census data that have yielded information on educational attainment and earnings, but not on individual ability. Thus, it has not been possible to determine how much of the variation in earnings associated with education might be attributable to differences in ability, although some analysts have devised methods for attempting to measure the influence of ability. But the Army Air Corps volunteers included in the Taubman-Wales study had all participated in a battery of 17 tests designed to measure various aspects of physical and mental ability. The results of these tests were available for analysis, along with the information on earnings and work histories provided by the respondents.

Another valuable feature of the data is their longitudinal character, in contrast with the cross-sectional data used by most human-capital analysts. The men included in the 1969 follow-up survey had also been respondents in an earlier study conducted by Thorndike and Hagen in 1955. Thus, Taubman and

Wales were able to analyze how education, ability, and other factors affected actual changes in earnings of these men between 1955 and 1969, rather than having to rely on variations in earnings at a given point in time to draw inferences about the interaction between age and other influences on income.

The study owes its importance, also, to the high degree of technical skill the authors have brought to the analysis.

The findings indicate that there was an upward bias of about 25 percent in their measures of the impact of education on earnings in 1955, if the influence of ability was omitted. The bias was somewhat smaller in 1969, reflecting the fact that differences in earnings associated with ability did not increase as rapidly as those associated with education between 1955, when the men were aged about 33, on the average, and 1969, when their average age was 47. Variations attributable to ability did not differ greatly according to educational attainment, with the important and interesting exception that by 1969 differentials associated with high ability were relatively large for men with graduate training.

An important qualification, however, is that it was only the results of the mathematical aptitude test that were reflected in these impacts of ability—none of the other tests had a significant effect on earnings differences. This is at variance with the findings of Hause (based on the same data and reported in the Juster volume), who used a composite measure of ability and found it had a significant effect on earnings. In evaluating the ability results, it is also important to keep in mind the fact that the average ability of the men in this sample was high—they all had to pass an initial aptitude test with a score equivalent to the median for high school graduates before qualifying for the battery of 17 special tests. Clearly, we need more experimentation with alternative measures of ability and with samples representing a broader spectrum of the population before achieving definitive results on the relative impact of ability and other influences.

In other respects, the Taubman-Wales results will add "grist to the mill" of both the supporters and the critics of human-capital theory—probably especially the latter. On the one hand, if allowance is made for differences in methodology and for the special characteristics of their sample, their rates of return to investment in education do not appear to differ strikingly from those of earlier investigators. On the other hand, their findings lend support to those who argue that education accounts for only a relatively small proportion of variations in earnings. Yet Taubman and Wales provide some evidence that casts doubt on the implication of Christopher Jencks and his coauthors that much of the variance is attributable to "luck."[1] For example, they find that the difference between excellent and poor health in 1969 was worth about $7,000 a year. They also made use of a composite "background" variable that had a significant effect on earnings differences.

Potentially even more damaging to human-capital theory is the Taubman-Wales finding that, for those with some college or a B.A., a substantial part of the earnings advantage associated with education was attributable to "screening," that is, the requirements or preferences of employers for those with a college education. But their method of measuring the effect of screening is crude, as they admit. Even so, the issue of screening and of its relationship to employment discrimination is becoming increasingly important and calls for much more research.

We are also approaching a stage in the evolution of human-capital research, I believe, when more attention needs to be paid to occupational differences in rates of return, as Eckaus has shown. Perhaps even more fundamental is the need to look less exclusively at money income as *the* measure of the economic results of education. Virtually all human-capital theorists pay lip service to the role of the consumption benefits of education and then ignore them as not susceptible of measurement. Similarly, most researchers, including Taubman and Wales, admit that there are social benefits that cannot be measured by the usual conventional methods, but then proceed to confine their efforts to measurement in the coventional manner. Finally, there is accumulating evidence that job satisfaction is often an extremely important component of the benefits of higher education. It would be a great step forward if someone were to devise a method of adjusting measures of pecuniary benefits to allow for the contribution of nonpecuniary rewards.

[1]C. Jencks and others: *Inequality: A Reassessment of the Effect of Family and Schooling in America*, Basic Books, New York, 1972, p. 8.

Foreword

by John R. Meyer
President, National Bureau of Economic Research

In this volume Taubman and Wales report on their study of the determinants of earnings. This work was supported by the Carnegie Commission on Higher Education as a part of the National Bureau of Economic Research's study of the benefits of higher education. The larger study was directed by F. Thomas Juster, and much of the research is summarized in the CCHE-NBER volume *Education, Income, and Human Behavior,* edited by Juster.

In their study Taubman and Wales make extensive use of the NBER-TH data set, a longitudinal sample of some 5,000 men born in the decade 1916–1926, surveyed in 1943 (by the U.S. Army), in 1955 (by Thorndike and Hagen), and in 1969 (by NBER). The sample consists of men who volunteered for certain Army Air Corps training programs during World War II. The data set, which is described in detail in Chapter 4, is a unique and important one. The authors of this volume were instrumental in bringing its potential availability to the attention of the National Bureau. They participated in planning the 1969 survey, and this volume contains much of their analysis of these data. (The sample was again surveyed in 1970 and 1971, and Taubman, as well as others within and outside NBER, are continuing to study the behavior of these men.) Here, Taubman and Wales use single-equation regression techniques to investigate the influence of formal schooling, measured ability, age, family background, and personal characteristics on the level of observed earnings in 1955 and in 1969, and on the growth in earnings over the working life through 1969.

This volume complements other recently completed and ongoing studies at NBER. It is one of several projects which contribute to an understanding of the relationship between formal schooling and measured ability as determinants of the level of and lifetime growth in earnings, of the influence of family background variables on earnings, and of the mechanisms through which schooling affects earnings.

This question of mechanisms, of how schooling affects earnings, is a difficult and complex one. It is also one on which those subscribing to human-capital theories and those skeptical of such theories are likely to differ. For adherents of the human-capital approach, many of the "other" influences on income often cited by critics as contradicting or undermining their theory are seen as easily incorporated into the human-capital model. To the critics, such incorporations often seem artificial, or at least unnecessary if one starts with a broader, less constricting set of relationships among income and human qualities, institutions, and environments. These differences are discernible at several points in this manuscript, but perhaps most noticeably in the discussion of the possible use of colleges as a "screening" device by employers.

The larger issue, though, in determining the benefits of education remains that of measuring social and nonpecuniary returns rather than just the private monetary returns. On this point, both those who adopt and those who criticize the human-capital approach agree. As a consequence, an ever-increasing portion of our human-capital studies at the National Bureau are devoted to these issues—the relationships between education and household's consumption behavior; the relationships between the preschool environment and the later school performance and the extent to which this preschool environment is conditioned by the income and education of the parents; the relationship between education and the taste for leisure (or, its obverse, labor force participation); the relationships between education and health; and the relationships between education and demographic behavior. Some of the preliminary findings of this research is to be found in the recent volume *Education, Income, and Human Behavior*, published jointly by the National Bureau and the Carnegie Commission; the rest has, or will emerge, in formal publications of the National Bureau itself.

Nevertheless, the unanswered questions about the value of education beyond the purely pecuniary remain and loom large. I am sure that they will challenge scholars at the National Bureau and elsewhere for years to come.

Acknowledgments

The research delineated in this book has benefited greatly from the assistance of many individuals at different institutions over the past few years. To achieve the goals of this study, it was necessary to have much better data than those previously available. Fortunately, Robert L. Thorndike at the Teachers College of Columbia University retained much of the data that he and Elizabeth Hagen had used in the fifties and made them available to us. Similarly, Dael W. Wolfle at the University of Washington allowed us to use the data that he and Joseph Smith employed in their analysis of earnings, also in the fifties. We wish to express our gratitude and to acknowledge our debt to both men for permitting us to share their data and for providing us with useful comments and warm encouragement.

We are greatly indebted to F. Thomas Juster and John R. Meyer at the National Bureau of Economic Research for providing overall guidance for our research effort and for helpful comments and insights. In addition, we have benefited from general discussions with the others at the Bureau engaged in closely related research—Jacob Mincer, Lewis C. Solmon, and Finis R. Welch. Suggestions of the Bureau's reading committee, Gary S. Becker, John C. Hause, Christopher Sims, and Melvin Reder, resulted in a number of changes that improved the manuscript considerably.

We had many helpful discussions with our colleagues at the University of Pennsylvania and at the University of British Columbia, and are especially grateful for the extensive time given by Robert Summers. Several individuals in addition to those mentioned above, to whom we sent preliminary copies of the manuscript, responded with very thoughtful and useful suggestions for improvement. In this connection, we are indebted to Carl Kaysen of the Institute for Advanced Study, who originally suggested this research topic; to Edward F. Denison of the Brookings Institution; and to Margaret S. Gordon, an associate director of the Carnegie Commission on Higher Education.

A study such as this relies heavily on the ability of research assistants to implement empirically the various hypotheses of interest. Consequently, we are deeply indebted to a number of excellent assistants, including Marc Freiman, Peter Gottschalk, Abe Haspel, Edward Villani, Keith Wales, and Janet Young. We also wish to thank Florence Barrow, Shelley Orloff, Patricia Purvin Good, Marie Resanovic, Machilla Roberts, Catherine Grant, and Diane Haspel for typing the many drafts of this volume. The services of the computer centers at both the University of British Columbia and the University of Pennsylvania were used extensively in carrying on the empirical analysis. At the National Bureau of Economic Research, Ruth Ridler did the editing and H. Irving Forman was the chartist.

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Paul Taubman
Terence Wales

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2 The President of the National Bureau shall submit to the Board of Directors, or to its Executive Committee, for their formal adoption all specific proposals for research to be instituted.

3 No research report shall be published until the President shall have submitted to each member of the Board the manuscript proposed for publication, and such information as will, in his opinion and in the opinion of the author, serve to determine the suitability of the report for publication in accordance with the principles of the National Bureau. Each manuscript shall contain a summary drawing attention to the nature and treatment of the problem studied, the character of the data and their utilization in the report, and the main conclusions reached.

4 For each manuscript so submitted, a special committee of the Directors (including Directors Emeriti) shall be appointed by majority agreement of the President and Vice-Presidents (or by the Executive Committee in case of inability to decide on the part of the President and Vice-Presidents), consisting of three Directors selected as nearly as may be one from each general division of the Board. The names of the special manuscript committee shall be stated to each Director when the manuscript is submitted to him. It shall be the duty of each member of the special manuscript committee to read the manuscript. If each member of the manuscript committee signifies his approval within thirty days of the transmittal of the manuscript, the report may be published. If at the end of that period any member of the manuscript committee withholds his approval, the President shall then notify each member of the Board, requesting approval or disapproval of publication, and thirty days additional shall be granted for this purpose. The manuscript shall then not be published unless at least a majority of the entire Board who shall have voted on the proposal within the time fixed for the receipt of votes shall have approved.

5 No manuscript may be published, though approved by each member of the special manuscript committee, until forty-five days have elapsed

from the transmittal of the report in manuscript form. The interval is allowed for the receipt of any memorandum of dissent or reservation, together with a brief statement of his reasons, that any member may wish to express; and such memorandum of dissent or reservation shall be published with the manuscript if he so desires. Publication does not, however, imply that each member of the Board has read the manuscript, or that either members of the Board in general or the special committee have passed on its validity in every detail.

6 Publications of the National Bureau issued for informational purposes concerning the work of the Bureau and its staff, or issued to inform the public of activities of Bureau staff, and volumes issued as a result of various conferences involving the National Bureau shall contain a specific disclaimer noting that such publication has not passed through the normal review procedures required in this resolution. The Executive Committee of the Board is charged with review of all such publications from time to time to ensure that they do not take on the character of formal research reports of the National Bureau, requiring formal Board approval.

7 Unless otherwise determined by the Board or exempted by the terms of paragraph 6, a copy of this resolution shall be printed in each National Bureau publication.

(Resolution adopted October 25, 1926, and revised February 8, 1933, February 24, 1941, April 20, 1968, and September 17, 1973)

National Bureau of Economic Research