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Volume Title: Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education, First Edition

Volume Author/Editor: Gary S. Becker

Volume Publisher: NBER

Volume ISBNs:

Volume URL: <http://www.nber.org/books/beck-5>

Conference Date: n/a

Publication Date: 1964

Chapter Title: Front matter, preface

Chapter Author(s): Gary S. Becker

Chapter URL: <http://www.nber.org/chapters/c14406>

Chapter pages in book: (p. i – xvi)

HUMAN  
CAPITAL



A THEORETICAL AND EMPIRICAL ANALYSIS,  
WITH SPECIAL REFERENCE TO EDUCATION

GARY S. BECKER

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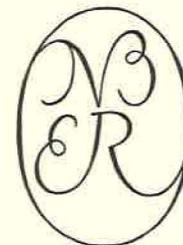
HUMAN CAPITAL  
A Theoretical and Empirical Analysis,  
with Special Reference to Education

National Bureau of Economic Research  
Number 80, General Series

# Human Capital

*A THEORETICAL AND EMPIRICAL ANALYSIS,  
WITH SPECIAL REFERENCE TO EDUCATION*

BY  
GARY S. BECKER  
*Columbia University*



PUBLISHED BY  
NATIONAL BUREAU OF ECONOMIC RESEARCH  
NEW YORK

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*Distributed by  
Columbia University Press  
New York and London  
1964*

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*To my wife Doria  
For encouragement and support during  
a long period of production*

*This study was made possible by funds granted by the Carnegie Corporation of New York to the National Bureau. The Carnegie Corporation is, however, not to be understood as approving or disapproving by virtue of its grant any of the statements made or views expressed herein.*

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## Preface

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THE origin of this study can be traced both to the finding that a substantial growth in income in the United States remains after the growth in physical capital and labor has been accounted for and to the emphasis of some economists on the importance of education in promoting economic development. My original intention was to shed some exploratory light on these issues by bringing together readily available information from Census reports on the incomes of persons with different amounts of education and from the Office of Education on the costs of education. For if education were economically important, I reasoned, money rates of return on education ought to be significant.

A long time has elapsed between the start, back in 1957, and the appearance of this monograph presenting the full analysis. During that time interest in the economics of education has mushroomed throughout the world and stimulated a profusion of research and policy proposals. Estimates have been made of the amounts invested in and the rates of return on education in both rich and poor countries. Perhaps some of the expanding interest can be traced to preliminary reports on the National Bureau study.<sup>1</sup>

This interest and further reflection, in turn, encouraged me to transform the original aim into a more ambitious undertaking. I became interested in the general theory of investment in human capital with its ramifications for a variety of economic phenomena. The theoretical analysis in turn led to an empirical examination of several other effects of education, such as those centering around the shapes

<sup>1</sup> The previously published reports consist of "Underinvestment in College Education?" *American Economic Review*, May 1960, and "Investment in Human Capital: A Theoretical Analysis," *Investment in Human Beings*, NBER Special Conference 15, supplement to *Journal of Political Economy*, October 1962.

## Preface

of age-earnings and age-wealth profiles. Finally, the discussion of rates of return covers a wider variety of evidence, groups, time periods, and implications than in other studies.

Support, assistance, and criticism were generously provided by many institutions and persons during the course of this study. Let me first thank the Carnegie Corporation of New York for their two grants to the National Bureau to explore work on the economic effects of education. Leave from teaching duties was provided by the Ford Professorship at Columbia University during the academic year 1960-61, and a Ford Faculty Fellowship during 1963-64.

The study would have been impossible without the aid of a series of unusually able and conscientious research assistants. Major contributions were made by Rosanne Cole, Linda Kee, and Eugenia Scandrett, with additional assistance from Mary Holman Faden, Shirley Johnson, and June Cohn.

T. W. Schultz, the major figure in the economics of education, has been liberal with encouragement and most helpful with criticism. I feel greatly indebted to him, and would like to record my appreciation here. Jacob Mincer has been exceedingly helpful in countless discussions and on numerous drafts with suggestions, criticisms, and that intangible asset—enthusiasm.

The National Bureau reading committee played an important role in improving the content. I am indebted to George J. Stigler, Richard Easterlin, Albert Fishlow, Milton Friedman, and Zvi Griliches. Many others commented on all or parts of various drafts. I would like to acknowledge the helpful contributions of M. Blaug, Arthur F. Burns, Edward F. Denison, Evsey Domar, Solomon Fabricant, Victor R. Fuchs, Leo Goodman, W. Lee Hansen, Hendrick Houthakker, C. Harry Kahn, James N. Morgan, Selma Mushkin, Alice Rivlin, and of various participants in the Labor Workshop at Columbia University. Members of the National Bureau Board of Directors who provided useful comments were V. W. Bladen, Marion B. Folsom, W. Allen Wallis, and Joseph H. Willits.

I am grateful to the editorial staff of the National Bureau, especially to Marie-Christine Culbert for her detailed and incisive comments. H. Irving Forman skillfully drew the charts.

## CHAPTER I Introduction

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SOME activities primarily affect future well-being; the main impact of others is in the present. Some affect money income and others psychic income, that is, consumption. Sailing primarily affects consumption, on-the-job training primarily affects money income, and a college education could affect both. These effects may operate either through physical resources or through human resources. This study is concerned with activities that influence future monetary and psychic income by increasing the resources in people. These activities are called investments in human capital.

The many forms of such investments include schooling, on-the-job training, medical care, migration, and searching for information about prices and incomes. They differ in their effects on earnings and consumption, in the amounts typically invested, in the size of returns, and in the extent to which the connection between investment and return is perceived. But all these investments improve skills, knowledge, or health, and thereby raise money or psychic incomes.

Recent years have witnessed intensive concern with and research on investment in human capital, much of it contributed or stimulated by T. W. Schultz. The main motivating factor has probably been a realization that the growth of physical capital, at least as conventionally measured, explains a relatively small part of the growth of income in most countries. The search for better explanations has led to improved measures of physical capital and to an interest in less tangible entities, such as technological change and human capital. Also behind this concern is the strong dependence of modern military technology on education and skills, the rapid growth in expenditures on education and health, the age-old quest for an understanding of the personal distribution of income, the