

COPYRIGHT NOTICE:

Stephen Machin and Anna Vignoles: What's the Good of Education?

is published by Princeton University Press and copyrighted, © 2004, by Princeton University Press. All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the publisher, except for reading and browsing via the World Wide Web. Users are not permitted to mount this file on any network servers.

For COURSE PACK and other PERMISSIONS, refer to entry on previous page. For more information, send e-mail to permissions@pupress.princeton.edu

Overview

This book seeks to provide the reader with an understanding of the key issues in the economics of education. Much of the focus is placed upon empirical research applied to various areas within the economics of education field. But a useful starting point comes from providing the book's readership with some knowledge of historical developments within the economics of education, and some understanding of the main theoretical concepts underpinning the research findings reported in the book.

The economics of education certainly has a long and distinguished history. Adam Smith (1776) alludes to the idea that one might invest in education to increase the productive capacity of society. However, it is Gary Becker who is generally considered the founding father of the economics of education as a distinct research field. In his treatise *Human Capital* (1964), he presents an analytical framework to explain why individuals invest in education and training in a manner analogous to investments in physical capital. The resulting human-capital theory is still the basis of most research in the economics of education field today, and it is certainly the theoretical framework used, or at least the starting point, for most of the discussions in this text. Human-capital theory (HCT) has of course been challenged and amended, sometimes in quite substantial ways (Spence 1973; Arrow 1973; Blaug 1976; Mincer 1974), but it remains the dominant paradigm today. It is also the case that some of the origins of what is presented in the book can be traced back to these ideas and to some of the classic writings from the 1960s and 1970s on the economics of education (like Blaug 1972, 1976; Freeman 1976; Layard and Psacharopoulos 1974; Psacharopoulos 1973; and Schultz 1961, 1963). Indeed much of the progress that has been made in the economics of education field since the pioneering days of the 1960s and 1970s, and this certainly applies to its recent rejuvenation amongst economists, has been in terms of the quality of the empirical evidence available (and the techniques used to obtain that evidence) rather than in terms of theoretical developments.

Although we do not set out a formal model of human-capital theory here (see Becker (1964) for the original statement of this), we do rehearse the basic tenets of the theory, given its importance for the economics of education. HCT represented a distinct break from the past, in that previously education was largely considered to be

a consumption good. The wealthy were assumed to consume more non-compulsory education than the less well off, just as they consumed more of other goods. Education was also classified as a status good, consumed by the middle and upper classes to signal higher social standing. Human-capital theory suggested that in fact education should be seen primarily as an investment good. Individuals invest in human capital, such as schooling, because human capital makes a person more productive and this gain in productivity is reflected in higher wages. Thus it is argued that individuals primarily make investments in schooling and other forms of human capital to earn a return, i.e. to increase their income in the future. This book is an attempt to answer, in a number of different contexts, the natural question that arises from this theoretical perspective: namely, what is the economic value of educational investments made by individuals, firms and the state?

This essentially simple theory is particularly powerful because it provides a tool to analyse such a diverse range of phenomena. Firstly, there are numerous forms of human capital, ranging from formal education through to on-the-job learning or firm-provided training. Thus human-capital theory can be used to explain investments in schooling, the provision of training by firms, the acquisition of vocational qualifications, the benefits of informal on-the-job learning and the like. Furthermore, it provides a framework for analysing any policy interventions that result in investments in education and other forms of human capital. Thus when the state invests in programmes such as a youth training scheme or a smaller-class-size initiative, we can analyse the likely impact of these programmes and their expected social and private rates of return using HCT. Of course, the chapters in this book do draw on other theories that are used in the economics of education. For example, Part II draws on models from both the education production function literature and school-effectiveness research, discussing as it does the production of education in schools. Furthermore, some authors challenge aspects of human-capital theory. Chapter 8, for example, is rooted in signalling and screening theory (Spence 1974; Arrow 1973), focusing on how employers use education generally, and qualifications in particular, as potential signals of individuals' innate ability. However, human-capital theory remains the mainstay of this text and indeed of the economics of education field as a whole and we direct the reader to Becker's original work (1964).

The book is structured into four parts: "Introduction"; "Who Gets More Education?"; "Economic Outcomes and Education"; and "What Can Policy Do?". A brief editorial introduction to each of these parts is presented in the following sections.

1.1 INTRODUCTION

This part of the book contains this overview and the first substantive chapter of the book (by Kirstine Hansen and Anna Vignoles), which places the UK educational sys-

tem into comparative context by highlighting features specific to the UK education system that make it of considerable interest to scholars interested in the economics of education.

1.2 WHO GETS MORE EDUCATION?

This part of the book looks at different phases of the education process. It begins with an assessment of schools and their effectiveness, offering a judgment on the extent to which schools and teachers matter for educational attainment. Chapter 3 (by Arnaud Chevalier, Peter Dolton and Ros Levacic) concludes that the school a pupil attends does matter and that the allocation of resources to schools can have potentially important effects on pupil attainment. Similarly, the chapter shows that the quality of teachers matters in determining school quality. Thus the labour market for teachers provides the subject matter of Chapter 4 (by Arnaud Chevalier and Peter Dolton). Chapter 5 (by Damon Clark, Gavan Conlon and Fernando Galindo-Rueda) moves to the post-compulsory phase of education, looking at what has happened to UK higher education in recent years, particularly its expansion over time. Chapter 6 (by Jo Blanden, Paul Gregg and Stephen Machin) then looks at educational inequality, focusing on the impact of parental education and resources on educational attainment, demonstrating strong links that persist across generations.

All over the world, people leave the education system with very different levels of education. This is certainly the case in the UK. This partly reflects different levels of attainment achieved during the years of compulsory schooling, and partly reflects decisions made by individuals on whether or not to invest in further education after the compulsory school-leaving age. An additional factor shaping why education levels at a point in time vary is adult learning, namely whether one engages in further education or training once out of the formal education system. This part of the book is concerned with who gets how much and what type of education, and the factors that determine this. From a theoretical perspective, taking account of the educational choices made by different types of individual is crucial for our understanding of the role of education in the labour market overall and of course its impact on productivity and wages. Whilst early work in the economics of education focused quite specifically on the problems of estimating the impact of schooling on wages, taking into account the fact that more-able individuals tended to acquire more education, the current research agenda is concerned with broader issues to do with schooling choices. Thus this part of the book is concerned with the education production itself, as well as the role of other factors, such as family background, neighbourhood and the like, that may influence an individual's schooling path. Before engaging with the detailed analyses of these important issues, we highlight some interesting facts about the progression of children through the UK education system.

Table 1.1. Percentage of children achieving government Key Stage targets in 2003.

	Reading	Writing	Mathematics
Key Stage 1: % achieving level 2 or better	84	81	90
Key Stage 2: % achieving level 4 or better	81	60	73
Key Stage 3: % achieving level 5 or better	68	65	70

The UK is one of the very few countries that externally monitor the attainment of children throughout the education system. Since the mid 1990s, every schoolchild in the UK has been assessed from the age of 7 onwards. There are national examinations at ages 7 and 11 in primary school and at ages 14 and 16 in secondary school. Furthermore, since 1995 the government has published school league tables of the results of these examinations, providing information on the achievement of all pupils in all schools at these ages (referred to as Key Stages 1, 2, 3 and 4, respectively). This provides a unique opportunity, in the context of the UK education system, to analyse how children progress through an education system, to identify factors that may improve that progression and to look at inequality in attainment at different stages of the education system. This provides the bulk of the analyses in Chapters 3–6.

Certainly, throughout the school years there are variations in pupil attainment. The percentage of children achieving the government’s Key Stage 1, 2 and 3 targets in 2003 is given in Table 1.1.¹ At Key Stage 4 the most-focused-upon statistic is the percentage of children achieving five or more “good” GCSEs (i.e. grades A*–C). In 2003, 52% of children obtained five or more A*–C GCSEs.

There is also clear evidence that higher achievement is negatively associated with economic and social disadvantage. As Table 1.2 shows, breaking down Key Stage test scores by three indicators – ethnicity, whether the pupil’s first language is English, and whether or not the pupil gets free school meals – reveals sizeable gaps in pupil attainment across ethnic groups, both for boys and girls, and shows worse levels for the English as an additional language pupils and especially for those on free school meals. Moreover, these gaps tend to widen out and are more marked at the later Key Stage levels (especially by free school meal status).

It is perhaps more interesting to consider how achievement varies as a child moves through the school system, as illustrated by looking at progression between Key Stages. Table 1.3 shows that achieving a target at one level by no means guarantees reaching the next target. Several progressions are given in Table 1.3. As an example consider the final row. This reports that, of those children who achieved level 4 or better on average at Key Stage 3, just over half (51%) went on to obtain five good-grade GCSEs.

¹The source for all the tables in this section is the DfES.

Table 1.2. Key Stage attainment and pupil characteristics, 2003.

	Ethnicity					Free school meals		English as additional language		
	White	Mixed	Asian	Black	Chinese	Other	Yes	No	Yes	No
<i>Boys</i>										
KS1, English	79	79	75	71	85	69	60	82	72	79
KS1, Maths	90	90	85	82	95	85	79	92	84	90
KS2, English	70	72	64	61	77	59	48	74	62	70
KS2, Maths	74	73	68	60	88	68	54	77	66	73
KS3, English	63	62	59	47	74	53	36	67	54	63
KS3, Maths	71	67	65	51	89	64	46	74	62	70
GCSE 5+A*-C	46	43	47	29	71	41	20	50	43	46
<i>Girls</i>										
KS1, English	88	88	81	82	93	77	74	91	81	88
KS1, Maths	92	92	87	85	96	86	82	94	84	86
KS2, English	81	82	75	74	87	68	61	84	72	81
KS2, Maths	72	72	65	61	89	66	52	76	64	72
KS3, English	77	76	73	65	86	65	52	80	68	77
KS3, Maths	73	71	66	57	90	65	47	76	63	73
GCSE 5+A*-C	57	55	59	43	79	51	29	61	54	56

Table 1.3. Percentage of children who achieved a target who achieve the next target.

Progression	Subject	Time Period	Percentage of those who achieved earlier target who achieve the next target
KS1 to KS2	English	1998–2002	68
KS1 to KS2	Mathematics	1998–2002	65
KS2 to KS3	English	1999–2002	78
KS2 to KS3	Mathematics	1999–2002	83
KS3 to KS4	5+ A*–C GCSEs	2000–2002	51

This illustrates that children's attainment and progression is altered as the child experiences different phases of the schooling system, as he or she attends different schools and is taught by different teachers. The first two chapters of this part of the book focus on two themes that matter most for pupil attainment and progression. Chapter 3 considers school and teacher effectiveness and how it impacts upon pupil attainment, whilst Chapter 4 considers the crucially important labour market for teachers.

Moving to the post-compulsory schooling phase discussed in Chapter 5, it has already been shown that there has been a sharp expansion in the numbers of UK children who stay on in the schooling system after the compulsory school-leaving age (Chapter 2). Whilst arguably still low relative to participation rates in other advanced countries, around 70% of children in the UK now stay on past the age of 16 and around half of these go on to higher education at age 18/19. Chapter 5 looks in detail at patterns of change in participation in post-compulsory education and at qualification attainment. Here we are interested not just in the quantity of education acquired, but also the type of education. A particular focus is placed upon the economic mechanisms that underpin the large changes in the level and type of post-16 participation that have occurred. Similarly, the role played by education policy is prominent in the discussion.

The other notable observation is that this sharp expansion of post-compulsory education does not seem to have been equally distributed across socioeconomic groups, as it has been concentrated upon children from higher social classes, or from families with higher incomes. This is contrary to views held by some, namely that education, or access to education, acts as a great leveller in society. In Chapter 6 the changing links between education participation and family income are considered. Strong evidence is presented showing that, during the period of higher-education expansion in the UK, links between education and parental income actually strengthened, revealing a significant rise in educational inequality. Rather than education reducing inequality, this then has resulted in a rise in inequality across generations as children

from more-educated (and higher-income) parents have increasingly colonized the upper echelons of the education system.

1.3 ECONOMIC OUTCOMES AND EDUCATION

This part of the book contains three chapters on the economic impact of education. It begins with Chapter 7 (by Richard Blundell, Lorraine Dearden and Barbara Sianesi), which considers a very important subject in the economics of education, namely what are the best methods of evaluating the value of education. They provide a careful and detailed discussion of the economic benefits relative to the costs of investment in education, and of how one can best measure such returns. Chapter 8 (by Andrew Jenkins and Alison Wolf) considers what employers want in terms of education. This is important given what has happened to the labour market in recent years, where employers' demand for workers with educational qualifications has risen. The chapter studies the reasons why this may be so. Chapter 9 (by Steven McIntosh) concludes this part with an assessment of how well the education system meets the needs of the labour market.

It has long been established that education yields economic benefits and, as Part II of the book makes clear, one of the reasons why people undertake education is that they perceive there to be a rate of return associated with their investment. But how does the market for education result in such returns, particularly if many more people now possess more and higher-quality qualifications than in the past? This is the subject matter of this part of the book, in which the various chapters look at the wage returns from education, the way that employers view qualifications, and the extent to which the education system is able to meet the needs of the labour market.

It is evident that the labour force is today more educated – in terms of formal educational qualifications – than in the past. Consider Table 1.4, which shows how the distribution of educational qualifications has changed over time in the UK.

The table confirms that there has been rapid upgrading of the educational status of the workforce since 1975. The percentage of men with a postsecondary degree rose from 5.8% in 1975 to 16.3% in 1998. Similarly, the share of men with a higher vocational qualification went up rapidly from 4.7% to 12.1%. But most striking is the falling proportion of men with no qualifications, which goes down from just over half (at 50.2%) in 1975 to less than 20% (18.9%) in 1998.

The patterns for women are even more marked. The percentage with a postsecondary degree rises over fivefold from a very low initial level of 2.2% in 1975 up to 12.5% in 1998. Interestingly there is much less of a shift into higher vocational qualifications compared with men as only 2.7% of working women possess such qualifications in 1998. Again, there is a sharp fall in the percentage with no qualifications, which plummets from 58.3% in 1975 to 23.3% in 1998.

Table 1.4. Employment shares (per cent) by education, 1975–1998.

	1975	1980	1985	1990	1995	1998
<i>Men</i>						
Postsecondary degree or higher	5.8	8.2	12.1	12.5	15.5	16.3
Higher vocational	4.7	6.8	10.5	11.4	11.7	12.1
Teaching and nursing	1.2	1.3	1.4	1.2	1.3	2.0
Intermediate	38.3	41.2	40.7	47.9	50.7	50.7
No qualifications	50.2	42.6	35.4	27.1	20.7	18.9
<i>Women</i>						
Postsecondary degree or higher	2.2	3.6	6.2	7.5	10.8	12.5
Higher vocational	0.7	1.3	2.0	2.9	3.8	2.7
Teaching and nursing	5.8	6.8	8.4	7.9	7.4	7.7
Intermediate	33.1	39.6	46.5	52.1	54.3	53.7
No qualifications	58.3	48.8	36.8	29.6	23.6	23.3

Notes. Calculated from successive General Household Surveys. For 1975–1995, statistics are based on three pooled years with the central year reported in the table. Source: updated from Machin (2003).

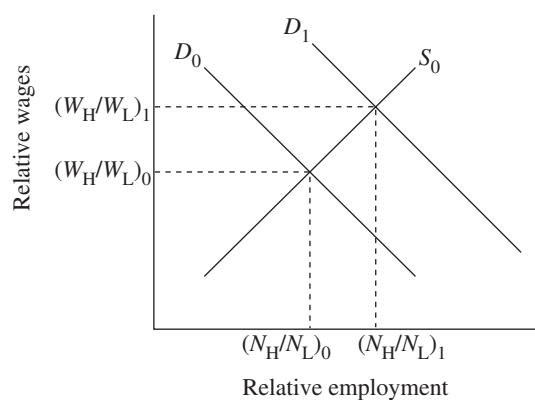
Given these large changes a natural assumption would be that this sharp increase in the supply of more-educated workers should depress wage gaps between more highly qualified and less qualified workers and thus lower the wage return to education. The logic here is simple, namely that because there are now more workers with higher education, employers have more of them to choose amongst and this increased competition for higher-education jobs should lower their relative wages. But this simply has not happened. Consider Table 1.5, which (now lumping men and women together) shows that, in both the UK and the US, at the same time as graduate employment shares rose so significantly the wage differentials between graduates and non-graduates did not fall and in fact rose. The table shows that the relative wages of graduates versus non-graduates for full-time workers (after standardizing for age and gender from a statistical regression) rose between 1980 and 2000. The increase is very sharp in the US, going from 1.36 to 1.66, whilst the UK increase is less marked but still shows a rise from 1.48 to 1.64.

It is by now fairly well established that these patterns are due to relative demand growing faster than relative supply. Hence it seems that increased education supply has not resulted in falling wage differentials between more- and less-educated people. A plausible, and attractive, way of thinking about this is in terms of an economic model where the wages and employment of skilled and unskilled workers are the outcomes of a race between supply and demand. In this context, to have generated simultaneously higher wages and employment for the skilled, relative demand must have increased by more than relative supply. Put alternatively, demand must have won the race between demand and supply so that employers are prepared to pay

Table 1.5. Aggregate trends in graduate/non-graduate employment and relative wages, UK and US 1980–2000.

	UK Labor Force Survey/ General Household Survey		US Current Population Survey	
	% graduate share of employment	Relative weekly wage (full-time)	% graduate share of employment	Relative weekly wage (full-time)
1980	5.0	1.48	19.3	1.36
1985	9.8	1.50	22.0	1.47
1990	10.2	1.60	23.8	1.55
1995	14.0	1.60	25.5	1.61
2000	17.2	1.64	27.5	1.66
1980–2000	12.2	0.12	8.2	0.30
1980–1990	5.2	0.08	4.5	0.19
1990–2000	7.0	0.04	3.7	0.11

Notes. Source: Machin (2003).

**Figure 1.1.** Shifts in relative supply and demand.

workers with appropriate skills and education more than less-educated workers, despite there being many more of them supplying their labour.

One straightforward way to rationalize this is to think of the changes in the context of a simple relative demand and supply framework as in Figure 1.1. The figure shows a labour market with two skill types: highly educated (denoted by an “H” subscript) and less educated (denoted by an “L” subscript). The initial equilibrium in the model is given by the intersection of the relative labour demand and supply curves given by D_0 and S_0 in the figure, with a relative wage of $(W_H/W_L)_0$ and relative employment of $(N_H/N_L)_0$.

CHAPTER 1

In terms of the UK and US experience what seems to have happened is that the ratio of high- to low-education wages has gone up at the same time as the ratio of high- to low-education employment. It becomes evident that, to get such an outcome, there has to have been an outward shift in the relative demand curve. Suppose the demand curve shifts out to D_1 (and hold supply fixed for expositional purposes²). One then ends up with simultaneously higher relative wages and employment for the skilled at $(W_H/W_L)_1$ and $(N_H/N_L)_1$.

This feature of modern education and labour markets is by now well known. But we need to know more about the magnitude of wage returns, and why employers increasingly demand graduates in such large numbers to offset the rapidly rising supply. This is the subject matter covered in detail by the three chapters in this part of the book.

1.4 WHAT CAN POLICY DO?

This part of the book offers an assessment of where we stand on education, its economic impact and education policy. It starts with an important subject for policy by offering a chapter (by Carl Emmerson, Sandra McNally and Costas Meghir) on how one can best evaluate education policies. The chapter discusses methodological issues, and provides examples from recent education initiatives. Chapter 11 (written by Stephen Machin and Anna Vignoles) is a final concluding chapter that spells out the lessons from the rest of the book that are relevant for the design of education policy. It offers a discussion of what seems to work best and how this links up with theoretical considerations on the key questions in the economics of education field.

²One can easily move the supply curve as well, but as long as relative supply has shifted to a lesser extent, one will still see higher relative wages and employment for skilled workers.