



Economic Principles for Education



THEORY AND EVIDENCE

Clive R. Belfield

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‘Clearly, the more students, within reason, Dixon could get “interested” in his subject, the better for him; equally clearly, too large a number of “interested” students would mean that the number studying Welch’s own special subject would fall to a degree that Welch might be expected to resent. With an Honours class of nineteen and a Department of six, three students seemed a safe number to try for.’

Kingsley Amis
Lucky Jim (1954)

‘Have those public endowments contributed in general to promote the end of their institution? Have they contributed to encourage the diligence, and to improve the abilities of the teachers? Have they directed the course of education towards objects more useful, both to the individual and to the public, than those to which it would naturally have gone of its own accord?’

Adam Smith
An Inquiry into the Nature and Causes of the Wealth of Nations (1776)

Preface

This book, *Economic Principles for Education: Theory and Evidence*, has been written for two sorts of reader. Primarily, it is for undergraduates interested in how economic theories and principles can be applied within a particular sector. So the text includes models, concepts, frameworks and diagrams. But the book is also for general readers interested in gaining an economist's perspective on education. So there is evidence, inference and some speculative exhortation. It is hoped that readers are sufficiently sceptical of all the arguments presented here that they can decide for themselves which are convincing.

There is plenty of excellent literature on the economics of education – as will hopefully be evident below – but, mostly published across a range of academic journals, it is not accessible as a collection. For anyone but the specialist or fanatic, it is difficult to appreciate the depth and breadth of the invasion economics has made into the study of education.

This book intends to redress that difficulty: using evidence from a range of countries (but mainly the UK and the US), it summarises and synthesises economic research on education. In this respect, this book builds on previous Economics of Education texts by Mark Blaug, by Cohn and Geske and by Geraint Johnes. These earlier texts covered similar ground to this one, but for different economic circumstances and with different institutional contexts. Within this tradition, this book is intended to illustrate the most attractive facet of the discipline of economics: supple analysis embedded in a set of core principles.

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1. The Application of Economics to Education

1.1 AN ECONOMIC DESCRIPTION OF EDUCATION

1.1.1 The Basic Concepts

Education – the process of learning new skills, of finding out new information or of understanding various phenomena – can be analysed by theories of cognition, theories of behaviour and through most Social Science disciplines. For the purposes of this book, education may be regarded as a way of generating, accumulating and maintaining human capital (Becker, 1985). Human capital – an individual’s embodied skills above their raw labour ability – can be obtained in many forms: schooling and training are the educational forms of interest here, but alternative forms may be experience or simply watching those who already have a larger stock of human capital. Typically, such accumulation takes a long time and it may be measured using educational credentials, such as certificates, years of schooling or examination grades. But although exams are sometimes an end in themselves, the deployment of human capital typically has external effects in the labour market, in the household or in broader society. Educated people are typically more skilled, allowing them to earn more; but they may also be more health-conscious, allowing them to enjoy life more, or more civic-minded, contributing to society’s goals. In choosing how to deploy their human capital to any of these ends, individuals are making decisions about resources, economic decisions.

Economics is a discipline which brings a particular mode of thinking to everyday activities. The fundamental assumption of economics is that the resources available to achieve any objective are scarce (when set against wants). This scarcity then affects how people behave – and so why they become educated – as well as how education is delivered through schools, colleges or in training. Such scarcity can be countered by the efficient utilisation of resources: a given objective is efficiently achieved if the lowest possible amount of resource has been used; and if resources are saved in

achieving one objective, they can be put toward achieving another separate one. Economists should therefore compare the actuality of education systems to the potential opportunities with the resources available, recognising that all resources have alternative uses or opportunity costs.

The aim of this introductory chapter, therefore, is to analyse education using economic principles and to do so in a way that provides strong justification for the sub-discipline of the economics of education. This requires a full response to the question: what roles can economists perform in analysing education?

1.1.2 The Roles of Economists

A first (and popular) role for the economist of education relates to the labour market. Education is a primary determinant of wages, included in most estimates of earnings, and for many drives the demand for learning and for training. From apprenticeships to higher education (and indeed, over-education), the labour market and education are interlinked at this micro-economic level. Aggregating up the individual labour effects, education may have macro-economic effects and raise economic growth.

Second, economists have a role in formulating behavioural and demand theory, studying how education changes behaviour and alters information sets. This applies to individuals, households and communities, across all domains: at work, in consumption and during leisure. To the extent that education is efficacious, and the human capital model articulates how it could be, people will demand it and this demand function – by population cohorts, for qualification levels and for course programmes – may be modelled.

A third role is in the study of educational organisations such as schools or universities: this encompasses their technologies, use of factor inputs and their objective, cost and revenue functions. The supply of education provision will depend on all these aspects and the theory of the enterprise can be applied to describing such provision.

A fourth role for economists is as market analysts. The equilibration of the supply of and demand for education will depend on how the market is constituted: schools may be competitive or cartelised and education may be traded either through vouchers, loans or allocated by fiat. The efficiency and equity of these market structures and exchange mechanisms merits attention.

Finally, economists have an important role as accountants. Education has become an increasingly important activity within all economies: from early years kindergarten instruction to continuing education and training, the accumulation of skills spans a lifetime, absorbing substantial scarce resources. So the scrutiny of publicly funded expenditures on education, as

well as non-market time of potential workers, is a significant research area in which economists can play an important role.

Table 1.1 Total Education Expenditure as a Percentage of GNP, 1996

	Education expenditure as a % of GNP
China	2.3
India	3.4
Japan	3.6
Germany	4.8
United Kingdom	5.4
United States	5.4
Australia	5.6
France	6.1
Canada	7.0
Norway	7.5
South Africa	7.9
Denmark	8.2
Sweden	8.3
World	4.8
<i>Low/middle income countries</i>	
East Asia & Pacific	2.7
Europe and Central Asia	5.4
Latin America and Caribbean	3.7
Middle East and North Africa	5.2
South Asia	3.0
Sub-Saharan Africa	4.3

Source: World Bank Indicators (1999)

For exposition, Table 1.1 shows education expenditures as a proportion of GNP across different countries as of 1996. The average expenditure is around 5% of GNP, but this varies considerably: China spends about half as much as the average country and, even within Western economies, the

Scandinavian countries spend at least two percentage points more than the average. There are also substantial differences across continents.

These figures typically exclude indirect (or private) costs of schooling and the opportunity costs of students' time (see also OECD, 1997). The overall trend in expenditures (if not in enrolments) has been reasonably stable (or even declining) over the last decade. UK expenditure, for example, rose by 2.8% in real terms over the five years 1993–97, a figure below generally accepted long run trend rates of economic growth (and suggestive of disinvestment by government in education, perhaps compensated by increases in private markets). Moreover, such aggregate figures obscure competing priorities within the education sector. Looking at UK expenditures during the 1990s, investment in children under five was significantly increased, with declining investment in the upper tiers of the education system. These changes reflect a significantly altered government investment strategy.

Table 1.2 Mean School Years and Participation Rates, 1960–90

	Mean school years		% with no education (age 15+)		<i>n</i>
	1960	1990	1960	1990	
Mideast and North Africa	1.22	4.47	81.0	41.0	10
South Asia	1.51	3.85	74.2	55.2	7
Sub-Saharan Africa	1.73	2.93	68.9	48.3	23
East Asia and the Pacific	2.83	6.08	52.5	15.4	10
Latin America and Caribbean	3.26	5.24	37.9	17.3	23
OECD	7.05	9.02	5.0	4.5	23
Former centrally planned economies	7.54	9.98	2.5	1.6	9

Source: Barro and Lee (1996)

Relatedly, Table 1.2 shows mean school years and participation rates in education across countries between 1960 and 1990. Substantial increases in mean school years are evident, broadly doubling within developing economies and increasing by around one-third in the OECD and former centrally planned economies. The coverage of education has also been extended: across all the developing economies, the proportions of population aged 15 or over with no education fell sharply. Substantial upgrading has also occurred in Western economies: for the UK over the

period 1973–95, the proportion of workers with no qualifications fell by around 60% and the numbers of degree holders rose at least threefold. Generally, these figures indicate a substantial increase in the world's stock of education (even as the distribution of education remains skewed towards males and the link between education funding and enrolment fluctuates). This greater stock of education without an obvious (or proportionate) increase in education expenditures suggests large scale changes in the production function for education.

Translating such stock and expenditure aggregates into per-student expenditures, the average for the OECD in 1995 was around \$3595 in primary, \$4971 in secondary and \$12 018 in higher education (Dutta et al., 1999, 357). Within these averages, there is a substantial spread: expenditure on university students in the US is approximately 2.5 times that in the UK, where grant spending per full-time equivalent student fell by around one third between 1993 and 1998 (DfEE/OFSTED, 1998). For these OECD nations, the ratio of higher education to primary education per-student expenditure appears reasonably consistent at 2–2.5 (this figure is derived both with the 1995 data and Tsang's (1988) cost ratios from the 1980s). As an alternative metric, spending per-pupil as a proportion of per capita GDP is broadly equal across primary and secondary schooling within the OECD (Barro and Lee, 1996; 1990 data). Across the developing economies, however, the relative investment across sectors is less balanced: secondary education receives around 2.6 times the per-pupil resource of primary education. Less clear – but equally important – is the relationship between government and private expenditure on education, that is, how substitutable and relatively efficient they are at generating human capital. In this chapter it is sufficient to refer to the probably substantial effects of all these changes in participation and resourcing and note that, in mapping these disbursements and resource usage, economics plays an essential role.

To fulfil each of these above roles, economists have access to copious amounts of data, typically cross-sectional and sample surveys. Data on educational activities have grown in volume and become more accessible to research: in the UK, league tables, inspection grades and Research Assessment Exercises are available for study; costs data are also available. These data offer a solid foundation for hypothesis testing and so are ripe for the economist both as an accountant and in the general role of the empirically minded social scientist.

So there are plenty of avenues for applying economic analysis and the economist's way of thinking to education. Perhaps this can be inferred from the substantial growth in the economics of education. None the less, there are two ostensible impediments. First, there is the grass-roots preoccupation of economists with markets: supply, demand and equilibrium. Yet there are few (competitive) markets in education and many educationalists are

resistant to this impersonal trope (Grace, 1994). And where they do exist, such markets do not seem to work in standard ways: few might be described as competitive and many are heavily regulated or commanded. Second, formal economics is a world of homogeneous goods, of limited uncertainty with tractable utility functions and standardised production technologies. Little of this seems directly pertinent to education, where consumption and investment are interlinked, where service provision is not homogeneous, where societal imperatives may dominate concerns over efficiency and where uncertainty and ignorance may be common. Education and learning may not easily be quantified and agents do not operate in perfect markets with complete certainty about future events. Hence there may be some resistance to applying predominantly quantitative, model-building tools and apparatus to a context-rich endeavour such as education. These two discrepancies should be recognised and they are addressed throughout the text – primarily through discussion of methodological issues. However, they are not found to be of critical importance: quantification is often possible for making decisions and agents do appear to act using the fullest available, albeit uncertain, expectations set.¹

In summary, this array of roles for the economist is reassuring: the returns to applying economics to education might appear to be high and economics may positively contribute to education policy. To show how this is possible, the next section describes the economic methods used to study education. These tools appear multivarious, but in fact can be reduced to two very simple ideas: the study of efficiency and cost–benefit analysis.

1.2 ECONOMIC METHODS

1.2.1 Efficiency Studies

Efficiency involves getting the most out of the resources available and therefore has two sides: what is ‘got out’ compared to what is ‘put in’. Both sides need to be considered: efficiency can be improved either if more is obtained from the same inputs or if the same amount is obtained but with less inputs. Efficiency can therefore be assessed internally, in terms of input resources to gain a given educational outcome, and externally, in terms of subsequent outputs achieved from a given resource dose of education. Behrman (1996, 345) distinguishes the three main forms of efficiency. First, allocative (internal) efficiency is where inputs are distributed toward the production of various outcomes in order that the values of marginal products for each input are the same across all uses. So university faculty should be optimally deployed both on teaching and research, for instance.