

# The benefits of education: What we know and what we don't

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The essay question I was set has two parts: what are the returns to education; and where do social and private returns diverge? The answer to those questions sheds light on what I take to be the questions the Treasury is *really* asking:

- What is the efficient level of spending on education?
- What is the efficient level of taxpayer subsidy?

This paper argues that these questions – though critically important – can be answered, at best, only indicatively.

The conclusion of a very different literature (Sen, 1999; Barr, 1999; Ravallion, 1996) is that it is not possible to quantify a value-free definition of poverty. Instead, the decision about where to pitch the level of poverty relief depends on social choice constrained by fiscal realities. This does not mean that there should be no poverty studies, but that judgement is needed in interpreting any particular set of results. I shall argue that problems – both of concept and measurement – mean that the benefits to education, similarly, cannot be quantified in any definitive way. A conceptual impasse, it is of course true, cannot be allowed to interfere with operational imperatives. Equally, however, one of the scarcest of all scarce resources is high-grade brain power, which should not be wasted in the search for a Holy Grail.

Section 1 discusses the objectives of education, the key point being that they are multiple and hard to measure. Section 2 discusses the benefits of education and explains the difficulties which arise in trying to quantify them. The implications for assessing the efficient quantity and mix of education spending are assessed in section 3. Section 4 discusses policy making when policy makers are imperfectly informed, looking particularly at tertiary education, the area where policy choices are most diverse and which evokes the greatest controversy.

## 1 Objectives: What do we mean by a 'good' education?

The objective of education policy is to improve educational outcomes. These outcomes derive from many sources: formal education is one; natural ability is another; good parenting is critical; and there is increasing evidence of the link between childhood poverty and poor educational outcomes.

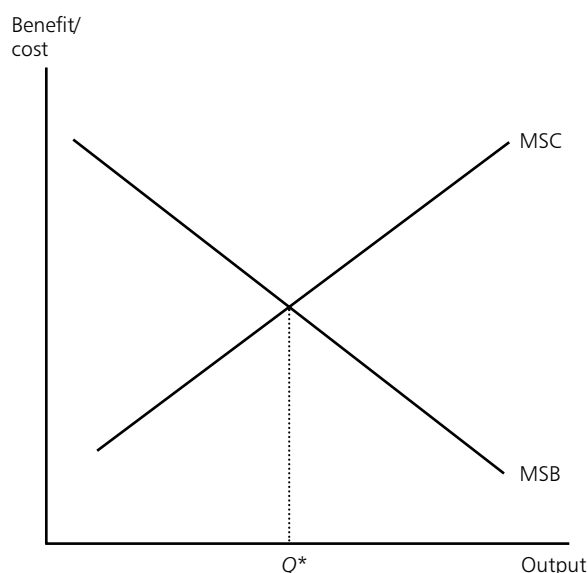
Improving educational outcomes has both equity and efficiency aspects. Equity is concerned with the distribution of educational outcomes, e.g. whether poorer people end up with fewer qualifications and, as a result, with lower incomes. One of many definitions of equity is that of *equality of opportunity*. This does not mean that everyone (for example) goes to university; it does not even mean that anyone who wishes can go to university. But it does mean that if two people have identical abilities and identical tastes, they receive the same education irrespective of factors which are regarded as irrelevant such as parental income. This definition of equity at least has the advantage that it apportions scarcity in a just way.

Allocative efficiency (sometimes referred to as *external efficiency*) is concerned with producing the types of educational activities which equip individuals – economically, socially, politically and culturally – for the societies in which they live. It embraces the total amount spent on education, and also the division of resources between different types and levels of education. It will depend, *inter alia*, on a country's economic development: in a poor country, efficiency suggests emphasis on basic skills of literacy and numeracy; wealthier countries can afford to spend more on greater diversity of subject matter and on more advanced education. In all these cases, efficiency is concerned with using today's educational resources well (static efficiency), and with using them to promote economic growth (dynamic efficiency).

Efficiency therefore matters. If resources are used inefficiently, they will fail to produce the maximum gain in educational outcomes and, in consequence, will fail to promote growth effectively. If no extra resources are made available, inefficiency means that some people will have less productive (and hence poorer) lives; and if, as a result, growth is lower it means that everyone will be less well-off in the future than they might have been. If extra resources are made available, inefficiency in the education system comes at the expense of better hospitals or roads, or higher personal consumption, deprivations which could be avoided with better use of educational resources.

The efficient level of output,  $Q^*$  in Figure 1, is that at which the marginal social benefit deriving from any improvement in the education system equals the resulting marginal social cost. To quantify efficiency therefore means that we have to measure (a) the social costs of education and (b) its social benefits. Measuring costs presents no insurmountable problems. The direct costs of the state educational system and its components are set out in the public

Figure 1: The efficient level of output



accounts. Apportioning overheads is not an exact science, but standard methods exist. For people past school leaving age costs should include an estimate of forgone earnings.

Measuring benefits is vastly more difficult. To explain why, it is necessary to look in more detail at what is being measured on the horizontal axis of Figure 1, in other words the meaning of 'good educational outcomes'. Discussion frequently portrays the issue as mainly technical, but that view is too narrow. It is insufficiently understood (not least because quantification is very difficult) that the primary purpose of education is to transmit knowledge and skills, *and* attitudes and values. Education is not only technical but also cultural. A central part of its purpose is to produce agreement about values.

To make these arguments more concrete, my teaching actively promotes certain values, for example that what matters is the analytical content of an argument, not the status or gender of the person making it. Contrasting views include: students should never disagree with their teachers; women should listen but not talk; answers get higher marks if they conform with my/LSE's/the government's ideology – all values which have been actively promoted in other times and/or countries, and some – for example the central importance of educating girls as well as boys – still a matter of considerable concern in some countries.

To that extent, the purpose of education is to promote a homogeneity of values. A second set of values, in contrast, promotes diversity, for example the view that disagreement is no bad thing, indeed that active discussion and debate is fundamental to the health of a free society. Related is the value of free expression in elections, with no subsequent retribution by the winners. In the educational context, the underlying value is that disagreement and debate are not only tolerated but are in many ways the purpose of a good education. As another aspect of diversity, families will have different views about subject matter, the role of discipline, and the place of religion.

A major issue in any society is the dividing line between the promotion of homogeneity and the boundaries of diversity. Freedom of speech is to be encouraged, but many western democracies make incitement to racial hatred a criminal offence. Diversity and artistic expression are valued, yet many countries have laws against pornography. Inculcating attitudes and values in this way may sound like the educational propaganda of communist education, but with the critical difference that in a free society the values which the educational system seeks to transmit have democratic legitimacy.

Values are important not just because promoting social cohesion is a significant activity in its own right, but also because values are an important ingredient in individual productivity, i.e. the technical and the cultural aspects of education can interact. Education in Communist countries, for example, included values supportive of central planning and totalitarian government, values which hinder productivity in a market economy (for fuller discussion, see Barr, 2001 *b*).

The conclusion to which this leads is that the education package, and hence the meaning of a 'good' education, will depend on the economic, political and social structure of the country concerned. Thus a definitive measure of the benefits of education is not possible. The next section discusses the problem in some detail.

## 2 Measuring the benefits of education

Attempts to measure the benefits of education face two sets of intractable problems: it is not possible to measure educational outputs, educational inputs or the connection between them

(section 2.1); nor (section 2.2) can we take for granted a causal link between education and its outputs. Thus a key problem on which Blaug (1975, 1985) dwells (and which explains the 'slightly jaundiced' view in the title of the first paper) is the difficulty in quantifying the causal link between education and increased individual productivity which lies at the heart of human capital theory. Notwithstanding the strong presumptive arguments in section 3, attempts to quantify the benefits of education rest on shaky foundations, a conclusion which advances in estimation techniques are unlikely to change soon.

### 2.1 Measuring output and inputs

**OUTPUT CANNOT BE MEASURED.** Since there is no single definition of a 'good' education, there is no unambiguous measure of educational output. It is possible to measure test scores but they are imperfect. First, the connection between test scores and technical skills is by no means simple, so that test results are imperfect even in their own terms. Second, even if tests were a perfect measure of technical skills, educational outputs are much broader. There are consumption benefits for the individual, including the enjoyment of the educational process itself. There are investment benefits, such as greater productivity and, connected, higher pay, greater job satisfaction, and increased enjoyment of leisure. Blanchflower and Oswald (2000) show that, holding everything including income constant, education is associated with greater recorded levels of life satisfaction; their results also show that job satisfaction is typically highest among people with advanced levels of education. A third set of deficiencies with test scores as a measure of output is that they take no account of a range of external benefits, including shared values. That most of these externalities are unmeasurable does not make them unreal.

**EXTERNAL BENEFITS.** Education may create benefits to society over and above those to the individual,<sup>1</sup> of which the following examples are conventionally discussed.

*Future tax payments.* There is at least one strong external benefit. If education increases a person's future earnings, it increases her future tax payments. Her investment in education thus confers a 'dividend' on future taxpayers. It is a standard proposition that in the presence of such an external benefit, the resulting flow of investment will be inefficiently small. A standard solution is an appropriately-designed subsidy. For precisely that reason, most countries offer tax advantages for a firm's investment in physical capital.

*Production benefits* arise if education makes someone more productive, and also makes others more productive. The fact that you have become computer literate and hence can use email may make me more productive. Individuals may become more adaptable and better able to keep up with technological change. The economic spin-offs of an occupationally mobile population are relevant in this context. It is not surprising that much 'high tech' industry occurs in clusters like Silicone Valley, Cambridge (Massachusetts) and Cambridge (England), and education lies at the heart of endogenous growth theory (Romer, 1993). Measuring these benefits is difficult, not least, as discussed below, because it is hard to separate the effects of education from other determinants of a person's productivity, such as natural ability and the quantity and quality of physical capital.

*Social cohesion.* Education may create cultural benefits external to the recipient, first, in that a common cultural experience (music, art, literature) may foster communication, both at the time and in the future. There may also be neighbourhood effects: taking

1 For fuller discussion of the theory, see Barr (1998a, Ch. 4 and non-technical appendix).

children to school, for example, brings people into contact and may foster shared attitudes locally. More broadly, there is evidence (Bynner and Egerton, 2000) of a link between participation in higher education and participation in political activities, community affairs and voluntary work. More broadly still, education is part of the socialisation process: its function in transmitting attitudes and values, discussed earlier, is a critical part of fostering shared attitudes, thus strengthening social cohesion.

These externalities, particularly the latter two, raise obvious measurement problems. As discussed below, there are also major conceptual problems. Though the externality argument is strong in presumptive terms, satisfactory empirical verification is lacking. Because of the 'tax dividend' point there is an unarguable external benefit, but it is not possible to show how much.

The conclusion is that it is extraordinarily difficult to measure the output of education, not least because of the problems of measuring non-monetary returns and external benefits.

**CONNECTING INPUTS AND OUTPUTS.** Even if output could be measured, a further set of problems concerns the connection between output and inputs, shown by the education production function. The first strategic problem is the difficulty of measuring the inputs: it is possible to measure the quantity of some inputs (teachers' and pupils' time, buildings, equipment, etc.), but not the quality of teachers; and inputs like natural ability and the quantity and quality of parenting cannot be measured at all. Second, as discussed already, it is not possible to measure output except in terms of test scores. Hanushek (1986) investigates the research on schooling 'and explores what has been learned and where major gaps remain, focussing on production and efficiency aspects of schools, as opposed to the ultimate uses of education' (p. 1142). In other words, he does not discuss external efficiency (i.e. the contribution of education to cultural and economic goals) but concentrates on internal efficiency, i.e. the effectiveness of the school system in producing educational outcomes such as examination performance. Hanushek (1996) goes into more detail on investment in education, discussing in particular the finding that '[t]hree decades of intensive research leave a clear picture that school resource variations are not closely related to variations in student outcomes ...' (p. 9). Given the range of missing variables, this result is not surprising.

A third problem in trying to connect inputs and outputs is that the production function itself is hard to estimate. Studies tend to assume (since no other assumption is available) that schools have a single, simple objective – maximising their pupils' test scores. Though that model is analytically tractable and has a surface plausibility, it is fundamentally flawed: it implies, for example, that a school should stop teaching children who are not capable of passing tests.

## 2.2 Establishing causality: the screening hypothesis

Even if all these measurement problems were solved, a problem remains. Previous discussion implicitly assumed that education leads causally to increased individual productivity. The 'screening hypothesis' questions the causal link, at least for post-primary education, arguing that education is *associated* with increased productivity but does not *cause* it.<sup>2</sup>

The argument has two parts: first, education beyond a basic level does not increase individual productivity; second, firms seek high-ability workers but, prior to employing them, cannot distinguish high-ability workers from low-ability workers, just as insurance companies may not be able to distinguish high- and low risks. In

that situation, individuals have the incentive to make themselves stand out by some sort of signal. The screening hypothesis argues that post-primary education does exactly that: it gives a signal to prospective employers which it is in the individual's interest to acquire – it signals that he or she is a high-productivity worker. Just as good health may be due more to a naturally strong constitution than to medical care so, according to this view, is productivity the result of natural ability rather than post-primary education. If we take the hypothesis literally, it means that there is a private benefit to the individual from post-primary education, but no external benefit.

There are various reasons why the strong form of the hypothesis does not hold. It fails, obviously, where education includes professional training, for example medicine. It also fails where there is more than one type of job: since skills and job characteristics are heterogeneous, it is necessary to match workers and jobs, so that education has a social benefit as a matching device. Whether the hypothesis has *some* validity is an empirical matter. The verdict is undecided and will likely remain so, since individual productivity, as discussed above, is partly determined by unmeasurable factors such as natural ability and family background.

## 3 What is the efficient level of education spending?

In short, it is possible to measure the costs of education, but not the benefits. What, then, can be said about the efficient level of education spending?

### 3.1 Quantitative analysis

If education (a) increases individual productivity and (b) creates external benefits, the amount of education chosen by an individual in a market system will generally be less than the optimal amount,  $Q^*$  in Figure 1. One solution is to subsidise education by an amount equal to the external benefits it creates. In contrast, if the screening hypothesis is valid, education has private benefits but no external benefits; thus there is no case for a subsidy for post-primary education. Since it is not possible to measure the output, it is not possible to quantify the external benefits; and since we cannot measure causality, we cannot establish whether and to what extent, education has a screening function. Thus it is not possible to measure the social benefits of education, with two major implications: it is not possible to quantify the efficient level of education spending,  $Q^*$  in Figure 1; and it is not possible to establish the efficient level of subsidy for post-primary education.

Notwithstanding these difficulties, many studies attempt to measure the returns to education.<sup>3</sup> Glennerster (1998) presents modifications of the DFEE evidence to the Dearing Committee, showing social and private rates of return to a degree. The figures in Table 1, like other such estimates, incorporate an 'alpha factor', which is the assumption about the extent to which the higher earnings of people with more education are attributed to that extra education. Thus  $\alpha = 0.6$  means that 60 per cent of extra earnings are caused by extra education; by implication the remaining 40 per cent is due to natural ability. Glennerster makes the point that social class still exerts a non-trivial influence in the UK, so that education might have an important screening function, especially for people from poorer backgrounds (in other words, a person from a poorer background might be considered for a 'good' job only if he or she has a degree). Thus alpha might well be lower in the UK than in the USA, where the influence of social class, it can be argued, is smaller.

<sup>2</sup> The large literature on this and other aspects of the economics of education is surveyed by Blaug (1976, 1985) and Glennerster (1993).

<sup>3</sup> For recent UK evidence, see the Education Department's submission to the Dearing Committee (UK National Committee of Inquiry into Higher Education, 1997*d*), Glennerster (1997*b*, Table 3.8), and Dutta, Sefton and Weale (1999). On the USA, see Card (1999).

**Table 1: Social and private rates of return to education, 19-year old men**

Social rates of return (%)	Alpha = 0.6	Alpha = 0.8
1985-7	6	7
1989/90 and 1991	7	9
1992-4	7	9
Private rates of return (%)		
1984-7	18	23
1989-91	13	15
1991	11.5	13

Source: Glennerster (1998, Table 3.8).

Recent papers investigate earnings differentials between identical twins with different educational experience in an attempt to control for ability (hence at least partially addressing the screening issue) and for family background.<sup>4</sup> These results are significant advances on earlier work, but still need to be heavily qualified. They measure the money returns to education, but omit nonpecuniary benefits to the individual, such as the consumption value of education and job satisfaction, and a range of broader social benefits, for example from shared values. As a result, these measures tend to underestimate both private and social benefits to an unknown extent. In addition, to the extent that screening is more of a factor than the estimates pick up, these measures overestimate social benefits (though not private benefits), again by an unknown amount.

For these and other reasons, the causal connection between education and economic growth cannot be quantified. Output growth depends on the increase in the quantity and quality of capital, the increase in quantity and quality of labour, on technological advance and on a range of other factors. Education as a whole affects only one of these variables, the quality of labour (and according to the screening hypothesis not even that), and more advanced forms of education are connected with technological advance. The estimation problem is to separate the quantitative effect of education on the quality of labour and on technological advance, given all the other influences on output, in a situation where measures of output, inputs, and the production function are highly imperfect, and where causality is problematic. It is therefore not surprising that quantitative measures of the link between education spending and economic growth remain problematical.

### 3.2 Qualitative arguments

This rather gloomy conclusion does not mean that we can say nothing about the connection between education and growth, but that we need to rely on more qualitative analysis. There are three lines of argument which connect education to national economic performance.

HUMAN CAPITAL: ALWAYS IMPORTANT, BUT ARGUABLY MORE IMPORTANT THAN EVER. Alfred Marshall, writing over 100 years ago argued that:

'[T]hey [the children of the working class] go to the grave carrying undeveloped abilities and faculties; which if they could have borne full fruit would have added to the material wealth of the country . . . to say nothing of higher considerations . . . many times as much as would have covered the expense of providing adequate opportunities for their development. 'But the point we have especially to insist now is that the evil is cumulative. The worse fed are the children of one generation,

the less will they earn when they grow up, and the less will be their power of providing adequately for ... their children; and so on to the following generations' (Marshall, 1961, Book VI, p. 569).

The essence of Marshall's argument is the high cumulative cost of making the wrong investment decisions. The costs of under-investing in tertiary education in terms of quantity and quality will be much greater than those of expansion which turns out not to have been strictly necessary.

Thus the argument that human capital is important is an old one. A new twist, due to Thurow (1996), argues that it is an even more important determinant of differential national economic performance today than in the past. The simplest way to make the point starts from a conventional production function:

$$Q = f(K, L, M)$$

where output,  $Q$ , is related to inputs of capital,  $K$ , labour,  $L$ , and raw materials,  $M$ , through the production function  $f$ . Considering each of these in turn:

- In the nineteenth century, access to raw materials was critical. A hundred years ago almost all the largest US firms were involved with raw materials in one way or another. Today, in contrast, value-added comes increasingly from other sources: the material component of computers is a trivial part of their cost; the steel used in a modern car costs less than the electronics.
- Historically, countries with a larger capital stock would typically be richer and so, through higher savings, could invest more than poorer countries, thus further increasing their capital stock, the US being a case in point. With today's global capital markets, domestic investment is less constrained by domestic savings: investment by an entrepreneur in Thailand is not constrained by Thai domestic savings, since he can borrow elsewhere.
- Technology (i.e. the function,  $f$ ) remains a critical determinant of relative economic performance. Historically, technology tended to be tied to specific countries. Today, not least because information flows are instant, technological advance moves across countries more quickly than hitherto.

Thus  $f$ ,  $K$  and  $M$  are less important explanations of differential economic performance today than in the past. The remaining variable,  $L$ , thus assumes increasing importance. In short, a combination of technological advance and international competitive pressures makes education a more important source of economic performance than ever.

THE NATURE OF TECHNOLOGICAL ADVANCE. A connected set of arguments relates to the nature of technological change. First, it takes the form of rising demand for skilled people and declining demand for unskilled workers. Second, change is increasingly rapid. Skills learned when young no longer last a lifetime; thus individuals need skills which are flexible enough to adapt to changing technology and which need updating. These changes explain the movement into the 'information age', meaning a need for education and training which is (a) larger than previously, (b) more diverse, and (c) repeated, in the sense that people will require periodic retraining. They also explain the close links between low educational achievement and social exclusion (see Atkinson and Hills, 1998; Sparkes, 1999).

4 On the USA, see Ashenfelter and Krueger, 1994; Ashenfelter and Rouse, 1998. For recent UK evidence, see Bonjour et al, 2000.

Not least because of the measurement problems already discussed, however, the argument is not a simple one. Technological progress increases the demand for skilled workers, but in specific areas can reduce the need for skills – for example, computers are much more user-friendly than 10 years ago. However, the overall decline in the demand for unskilled labour has been sharp. Thus part of the case for investment in education and training is to ensure that workers have the skills necessary for the application of modern technology. As second part of the case is that investment in human capital – particularly in broad, flexible skills – offers a hedge against technological dynamism. Specific skills may become redundant, but education and training should give people general skills, and therefore saves the resources which would otherwise have to be devoted to retraining labour whose skills had become outdated or, at worst, to supporting workers socially excluded as a result of technological advance. As discussed in Barr (2001 *b*), a problematic legacy of communist education is the narrow, inflexible skills it gave people.

**DEMOGRAPHIC CHANGE.** The proportion of older people is rising, presaging high spending on pensions and other age-related activities such as medical and long-term care. The best solution is to increase output sufficiently to meet the combined expectations of workers and pensioners. If the problem is that workers are becoming relatively more scarce, the efficient response is to increase labour productivity. Demographic change is thus an argument for additional spending on investment both in technology and in human capital. Expansion of education and training, it can be argued, is therefore necessary precisely *because* of demographic change.<sup>5</sup>

For all these reasons, notwithstanding the impossibility of quantifying the efficient level and mix of spending on education, training and retraining, the qualitative arguments that education contributes to personal and national goals are strong. The Dearing Committee (UK National Committee of Inquiry into Higher Education, 1997*b*, para. 6.8) endorsed the ‘international consensus that higher level skills are crucial to future economic competitiveness’, and went on to quote an OECD (1997) study:

‘The direction is universal participation: 100 per cent participation with fair and equal opportunities to study; in some form of tertiary education; at some stage in the life cycle and not necessarily end on to secondary education; in a wide variety of structures, forms and types of delivery; undertaken on equal terms either part-time or full-time; publicly-subsidised but with shared client contributions; closely involving partners in the community; serving multiple purposes – educational, social, cultural and economic’.

## 4 Application to tertiary education: making policy when policy makers are imperfectly informed

### 4.1 Who should pay?

In considering who should pay for tertiary education, the starting point is the assertion that a high-quality mass system cannot be entirely taxpayer funded. Thus public funds have to be supplemented by private funds. This conclusion is based not on ideology, but on two deeply practical arguments: large-scale tertiary education is vital; but it is too expensive to rely entirely on public funding. Thus it is necessary to involve private funds. These can come from various sources including the student’s family, and student earnings while a student. Both of these have their place.

However, the only source of private funds which is both large-scale and equitable is students’ future earnings. A well-designed student loan scheme is therefore a core element of a mass system, specifically a wide-ranging system with income-contingent repayments of the sort I have advocated elsewhere.<sup>6</sup>

How should costs be shared between the taxpayer and the individual, i.e. how much subsidy should the various components of tertiary education receive? The theoretical argument is that the student should pay for her private benefit, while the taxpayer contributes a subsidy equal to the external benefit.

This argument commands almost universal acceptance in qualitative terms. As explained in section 2, however, there is no scientifically valid way of measuring the relative sizes of private and external benefits. The following discussion takes it as read that there *is* a case for continuing subsidy, but leaves open its size (a) because there is no definitive way of measuring it, and (b) because – whatever the scientific arguments – the matter is ultimately one to be decided by politicians and the electorate.

Whatever the size of the external benefit, however, there is one strong result – that tertiary education – and especially higher education – creates a private benefit, i.e. the typical student benefits personally from a degree, through higher earnings, greater job satisfaction and/or greater enjoyment of leisure. Thus the theory argues unambiguously that some of the costs should be borne by the individual. Alongside macroeconomic arguments about affordability, microeconomic arguments therefore also point to the centrality of a good student loan scheme.

### 4.2 Who should make the decisions?

Three questions stand out: are consumers capable of making good decisions; are universities and other institutions capable of making good decisions; and who should decide how large the system should be?

**HOW USEFUL IS CONSUMER SOVEREIGNTY?** I have argued elsewhere (Barr, 1998*a*, Ch. 13; 1998*b*) that students are generally able to make efficient choices for two sets of reasons: they are generally well-informed and/or have the time and capacity to make themselves well-informed;<sup>7</sup> separately, tertiary education is becoming increasingly diverse, making the problem too complex for a central planner. Consumer sovereignty is therefore useful. The analysis leads to very different conclusions for school education.

**HOW USEFUL IS PRODUCER SOVEREIGNTY?** One aspect – academic freedom – I take as a given. A second aspect – the *economic* freedom of universities – is the subject of heated discussion. With an elite university system of the sort existing in most countries until relatively recently, it was possible, as a polite myth, to assume that all universities were of equal quality, that degrees were worth the same whichever university conferred them, and hence that universities could, broadly, be funded equally. With a mass system this myth is no longer sustainable. The characteristics, the quality and the costs of different degrees at different institutions will vary much more widely than hitherto.

As a result, universities need to be differentially funded to take account both of a particular institution’s costs and of the demand for places. In principle this could be done by an all-knowing central planner. The problem, however, is too complex for that to be the sole mechanism. A mass system – and a *fortiori* a mass system in an increasingly complex world – needs a funding regime in which institutions can charge differential prices to reflect their differential costs.

<sup>5</sup> For fuller discussion of pensions policy in the face of demographic change, see Barr, 2000.

<sup>6</sup> See Barr and Crawford (1998*a*, *b*) and, for fuller discussion, Barr (2001 *a*, Chs 10-14).

<sup>7</sup> As discussed later, while it is true that the generality of students are able to make efficient choices, this is much less true of people from socially-excluded backgrounds, for whom explicit action is needed to increase knowledge and raise aspirations.

The conclusion this suggests is that producer sovereignty is not just useful; as tertiary education expands and the diversity of its activities increases, it becomes essential. As discussed below, this does not mean unfettered markets.

HOW LARGE SHOULD THE SYSTEM BE? Why is mass tertiary education necessary? Is there an investment argument: would expansion of tertiary education increase the rate of economic growth? Second, should there be expansion for consumption reasons, i.e. would extra resources add sufficiently to the quality of life (for reasons other than output growth) to make expansion efficient? Though these questions are critically important, they cannot be answered as crisply as the questions about consumer and producer sovereignty.

From an investment viewpoint, several arguments for expanding tertiary education were put forward in section 3. First, it can be argued that technological change makes human capital more important than ever as a determinant of national economic performance. The nature of that technological change is leading to rising demand for skilled people and declining demand for the unskilled. Its rate of change requires that individuals are retrained periodically – so-called lifelong learning. Those arguments are strengthened by international competitive pressures. To keep up with other countries it is necessary to increase the productivity of capital and labour; if tertiary education contributes cost-effectively to increased productivity there is an efficiency case for expansion. A complementary argument, as the earlier quote from Alfred Marshall brings out, is the downside risk of under-investing rather than over-investing. Finally, demographic prospects strengthen the argument for additional investment in education and training.

These arguments create a strong presumption for increasing the resources devoted to education (for discussion of higher education, see Greenaway and Haynes, 2000).<sup>8</sup> For the reasons set out in section 2, however, the case is strong only in presumptive terms. We cannot state with any precision how much additional investment there should be in total nor, as discussed earlier, how the costs of that investment should be divided between the individual and the state.

POLICY WHEN POLICY MAKERS ARE IMPERFECTLY INFORMED. The preceding discussion suggests the following stylised facts: (a) consumers of tertiary education are generally well-informed; (b) producers are generally well-informed; (c) the optimal size of the sector cannot satisfactorily be quantified.

Let us accept (a) and (b), at least in the weak sense that consumers and producers, if not perfectly-informed, are at least better-informed than central planners, not least because of all the unmeasurable benefits. This suggests that a broad strategy for dealing with (c) is to divide responsibility into two separate decisions:

- Consumers and producers decide on the size of the sector: students apply to institutions; providers decide how many students to accept and what fees to charge; employers decide which graduates they want to employ. These are decisions properly made by the citizenry and by education providers.
- Government decides how much it proposes to spend on tertiary education. This decision is properly the province of government. If public spending falls short of that necessary

to meet the choices of citizens and education providers, the difference has to be made up with private spending.

In short, the market decides on *total* spending, the government on *public* spending.<sup>9</sup>

### 4.3 The resulting system

The analysis of this and earlier sections suggests that the providers of tertiary education should set fees, with income-contingent loans covering all tuition charges and living costs which are not covered by taxpayer funding.<sup>10</sup>

EFFICIENCY. The argument for efficiency is that participants are well-informed and all relevant stakeholders – students, universities, employers and government – have an influence on outcomes.

Students pay a part of the cost of their qualification and are therefore better placed to demand greater variation in what universities provide. Students will make choices about which institution they attend; they will make demands about the type of course they go to; they will also make demands about the structure of the qualification – for example whether a degree is part-time or full-time, 3-year or compressed into a shorter time; teaching during the day or in the evening, etc.

Employers can influence outcomes indirectly through their choice of employees. They can also have a direct influence through negotiation about course content. For example, professional bodies such as accountants and social workers already give partial exemption from professional examinations to students graduating from courses whose content takes account of the needs of those professional bodies.

Education providers also have a role, responding to changes in the pattern of demand in ways which are wholly impossible within a centrally-planned funding mechanism. Institutions have to be free to determine price (i.e. the level of tuition fees they charge), quantity (i.e. the number of students they accept), and quality, i.e. the types of courses they offer. Thus they will have economic freedom to parallel their academic freedom.

Finally, government retains a major influence. It no longer controls the system as a central planner, but that does not mean that it is powerless – far from it. Government has a direct role in funding, as discussed earlier. It also acts as a facilitator for private funds, for example through its role in implementing a system of student loans. Its second important task is to promote access in the ways described in the discussion of equity, below.

The third role of government is quality assurance. Part of the task is to ensure that regulation is in place and enforced. Incentives, however, are at least as important, for example more generous funding for institutions with better completion rates, subsequent employment rates, and the like. It is also possible to combine regulation and incentives: a minimalist system of quality control would simply require universities to publish timely and accurate performance data on their web sites, for example the destination of its recent graduates, thus giving prospective students the information they needed to vote with their feet (see Cave *et al.*, 1992).

A fourth role of government is to influence the degree of competition between institutions. Tertiary education providers are not the conventional firms of economic theory: they do not make a homogeneous product; they do not maximise profit; and the 'product' is not well-defined (see Winston, 1999). Thus red-in-

8 In 1995 total spending (public plus private) on higher education in the UK was 0.7 per cent of GDP. The comparable figure in the USA was 2 per cent; the OECD average was 1.5 per cent. In 1996 Argentina spent 0.7 per cent and Chile 1.6 per cent of GDP, respectively (all figures from OECD, 1998, Table B1.1d). At face value, the UK therefore would have to spend an additional, £billion per year on higher education to reach the OECD average. Any increase on remotely that scale would have to a significant extent to come from private sources.

9 This strategy is presented at its simplest; in practice, as discussed shortly, the government would not take an entirely passive role over student numbers or tuition fees.

10 This is the system Iain Crawford and I proposed to the Dearing Committee, subsequently published as Barr and Crawford, 1998a.

tooth-and-claw competition is not the best environment for tertiary education. That, however, does not mean that competition has no role. An important task of government is to regulate the extent of competition.<sup>11</sup>

EQUITY. The system outlined above is also more equitable. First, it improves targeting, since a move from tax funding towards loans – particularly in higher education – reduces the subsidy to the best-off. A move towards market prices (i.e. fees set by universities within a regulatory framework) fully supported by income-contingent loans makes it possible to take the large sums currently spent on *general* subsidies and use them instead on *specific* subsidies carefully targeted on groups for whom access is most fragile. Such a move is unambiguously progressive.

The system is more equitable, second, because targeting frees resources to promote access more directly and powerfully than measures which spread subsidies more indiscriminately across the student population. Such policies have several important dimensions. Money is clearly an important ingredient. Scholarships for bright disadvantaged people means that they need a smaller loan or no loan. Access can be improved also by making loans available to all students, full-time and part-time, undergraduate and postgraduate, in further education and higher education.

Information and raising aspirations are also critical. Many people do not progress to further or higher education because they have never thought of doing so. Thus mentoring of school children by current university students, preferably from similar backgrounds, is important; so are visits by schoolchildren to universities. Action to improve information is vital for access precisely because students from socially-excluded backgrounds will systematically be badly-informed. Such information activities need to happen early enough to prevent school drop out.<sup>12</sup>

Extra teaching/tutoring is a third ingredient. Finally, since the problems of access to higher education cannot be solved entirely within the tertiary education sector, resources should be used to promote access earlier in the education system.

The approach outlined above is explicitly aimed at a situation where, in the face of complex mass systems of tertiary education, policy makers are imperfectly informed.

- The system is efficient because outcomes are determined not by a single, imperfectly-informed part of government, but by the interacting decisions of students, universities and employers, subject to transparent influence by government.
- Choices, as far as possible, are made in the face of efficient prices, for example, student loans should have an interest rate based on the government's cost of borrowing.
- Flexible tuition fees, flexible student numbers and flexible percentage of taxpayer subsidy allow the system to evolve to accommodate a changing economic and technological environment and changing preferences.

The arrangements are also more equitable than present arrangements because resources are better-targeted and hence can be used to promote access more directly and effectively.

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11 For fuller discussion of how voucher-type arrangements can encompass anything from completely unconstrained competition, at one extreme, to a mimic of central planning, at the other, see Barr (1998a, Ch. 13). On equity aspects of vouchers, see Le Grand (1989).

12 The sorts of schemes which are involved include Saturday Schools, which bring schoolchildren from poor areas to university to study on Saturday morning; summer schools, which do something similar during the summer vacation; visit days when schoolchildren can visit a university; visits by academics to schools to make the idea of higher education more tangible; visits by current students, ideally from the same or a similar school, to schools in deprived areas; and mentoring of school children by university students, preferably from a similar background.

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