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Education and Economic Development

What is known of the established relationships between education and economic development? This is a question that I have studied for several years, and I wish to summarize my views here. It would perhaps be as well to enter here my caveat that the interrelationships between education, productivity, the economy and society are enormously complex and that we know little about them. I will leave on one side for the moment, too, accusations of philistinism — I love the arts — need I say more? I write as an economist who has worked in many fields of economics, but I also write as one who has taught for seventeen years, and who has been involved in the administration of public school systems for almost as long. I reject the distinction between “economist” and “educator” — though, in economics (as elsewhere) to assume the mantle of educator is, I have discovered, to lose caste in some circles. Perhaps the wisest place to begin would be the widely repeated statements about the part of economic growth which has been measured and attributed to education in a number of — especially — American publications. In particular, this part of my paper draws upon the analyses published by Mr. Edward Denison: before I describe it I should emphasize that the statistical work he has done has been extremely laborious, and I have the highest admiration for it. This work is an attempt to evaluate the benefits of education. Many benefits are non-commensurate without an assumption that a common numerical value can be assigned to them (and these numbers — indeed the very process of assigning numbers — are, of course, in dispute). My own original work lay in the back-breaking task of trying to evaluate the costs of education.

In principle, the work rests upon a series of hypotheses, and a series of calculations derived from these hypotheses. It is argued, first, that after standardising for ability, race, social class, sex and other socio-cultural factors, a relationship has been established between educational attainment and lifetime earnings. These relationships are investigated by many methods, but the primary source is census data which relates years of education to occupation and income. The lifetime earnings have to be standardised, of course, for price changes and life-expectancy. They incorporate, therefore, both data from the past, and

assumptions — or extrapolations — about the future. These lifetime earnings, properly discounted, can be expressed as a rate of return on the cost of education. The cost of education may be measured in a variety of ways, but usually in this work it is calculated as what is called the opportunity cost, that is to say total educational costs plus loss of earnings which would have been made had the students been in employment when they were at college or at high school.

Using an orthodox production function of the Cobb-Douglas type, other inputs are similarly evaluated, and in the large area which is left as a residual after such identifiable inputs as the contributions of the growth in the size of the labour force, changes in its age structure, and changes in the capital stock and in its structure, and other certain measurable inputs have been abstracted from the growth rate, it is calculated that the residual is mainly due to education and to the growth of knowledge.

If I may, I would like to quote Professor Harry Johnson on this:

The essence of it is to regard "capital" as including anything that yields a stream of income over time, and income as the product of capital. From this point of view, as Fisher pointed out, all categories of income describe yields on various forms of capital, and can be expressed as rates of interest or return on the corresponding items of capital. Alternatively, all forms of income-yielding assets can be given an equivalent capital value by capitalising the income they yield at an appropriate rate of interest. By extension, the growth of income that defines economic development is necessarily the result of the accumulation of capital, or of "investment"; but "investment" in this context must be defined to include such diverse activities as adding to material capital, increasing the health, discipline, skill and education of the human population, moving labour into more productive occupations and locations, and applying existing knowledge or discovering and applying new knowledge to increase the efficiency of productive processes. All such activities involve incurring costs, in the form of use of current resources, and investment in them is socially worth while if the rate of return over cost exceeds the general rate of interest, or the capital value of the additional income they yield exceeds the cost of obtaining it. From the somewhat different perspective of planning economic development, efficient development involves allocation of investment resources according to priorities set by the relative rates of return on alternative investments.¹

Thus underlying this work is a formidable battery of neo-classical capital theory, and complex and thorough statistical work. Before I say what I understand the work to have shown I had better mention the objections.

Now the opposition to this chain of reasoning is twofold. It concentrates first upon the relationship between subsequent earnings and educational careers. It argues that the returns to labour are what economists call conventional or institutional returns, which bear little relationship to the orthodox reasoning of market economics. In other words the labour market is not appropriately described by the perfect

¹John Vaizey, editor, *The Residual Factor and Economic Growth* (Paris: OECD, 1964), p. 221.

competition model. And secondly and more notably, following the attack by Professor Kaldor and others, they refute the assumption upon which the work ultimately rests, namely the existence of a production function of this type. Professor Kaldor said at the same meeting as that from which I quoted Professor Johnson, that "All such estimates are derived from hypotheses concerning the so-called 'production function' and the price system, (it is a mild description to call them 'strong assumptions') which have no theoretical or empirical basis whatever." As Mr. Robert Neild said (again at the same place — it was a lively affair): "It was evident from the discussion that the division between those who believe in the marginal productivity theory of distribution and those who do not was a matter of faith; it was not something that could be resolved by discussion (or conversion)."²

This is not the place to discuss the validity of the arguments to and fro. It is sufficient to say that the very basis of the matter is in dispute. I would merely say that in principle this work of Denison's, and other studies, if its assumptions are accepted, does seem to show the rates of return on education are certainly no lower than those from physical capital; and secondly, that of all the factors that contribute to growth, the biggest is that which is attributable to education, and these results have been found to be the case not only in the United States, but in a number of other countries where similar calculations have been made. The policy conclusions are obvious; broadly speaking too little has been devoted to human capital in the United States, and a reallocation of resources away from physical capital to human capital would have accelerated growth. (Harberger and others claim to have found the opposite in India, and elsewhere.) But even more important than the general results is the general claim of reasoning that policy for growth ought to be couched in terms that explicitly include education in the equations. This is an extremely important point — and it is one now accepted in long-term looks at the economy. It is not accepted, I think, in short-term macro-economic work; one sees no sign of it in Treasury or N.I.E.S.R. forecasts of the short-term growth rates. I write this in parenthesis as a note of caution to those who believe that all economists accept in their hearts, and in their heads, the economic importance of education. They don't. I will not dwell here on the issue that this work has raised for the organization of education. Broadly they concern the question whether education ought to be bought or sold on the market or not. Milton Friedman has argued strongly on moral grounds that it ought to be sold on the market. I would merely point out that this is not self-evidently so — and further, that "market economics," as a moral doctrine, rests on solipsism which appears to be a logical contradiction in this context. Further, I see no reason to assume that pure competition would prevail in the supply or

²*Ibid.*, pp. 138, 273.

demand for education. (I have expounded these views at length elsewhere and my arguments have never been answered.)

The second point I would wish to make is that calculations have been made differentiating the different roles of education throughout the world, and the results tend to lead one to suppose that no less important than the quantity of education is its quality. It would be interesting to see a completely different mode of approval, through what people had learned what thing, or what ways of behaviour, rather than just the crude years of schooling. But in the absence of such studies we must deal with the quantity of material that is available at present. The evidence of the Coleman Report, and English evidence, suggests of course that the school, as such, is less important in social conditioning than other conditioning agencies (mostly the family).

The evidence, so far as I can interpret it, tends to suggest that the more education you have the lower the increment of output which comes from additions to education. That is to say, if you start with somebody who has zero education and give him a small amount of education, the returns are very large; but it tends to fall the more education you have. On the other hand, there is little evidence to suggest that in very rich societies the returns to education are lower than the returns to education in poor societies. In other words, it does not look as yet as though we have reached the stage where education gives diminishing returns because of the very affluence of the society. The answer to this paradox must lie in the complementarities in the situation, rather than in anything else.

As I have said, argument will rage back and forth as to the validity of these types of calculation. I am myself more agnostic about them than many people, particularly in the United States, would tend to be, and I have grave doubts about many of the figures presented, and much of the reasoning that lies behind them. But I think they tend to confirm what intuitively is not entirely unobvious, namely that technologically progressive societies, which also tend to have fairly high and sustained growth rates, tend to spend substantial sums of their Gross National Product on education, and that since the proportion of the Gross National Product spent on education is rising throughout the world, the potential growth rate is also rising. The evidence for these two very general propositions, drawn both from economic history and from recent economic analysis, is most striking. There are the examples of the German technical education system, the American high school and land grant college system, the Japanese education system, both after the Meiji era and at present, the Soviet education system, and (I would add) particular parts of the English education system. Here, again, there is a real problem, I think, in interpreting the story as to which is cause and which is effect. There seems to me to be little doubt that, viewed historically, German experience of widespread technical education and widespread literacy, does suggest that technical education

played a key role in their economic development. On the other hand, there is little sign that the quality or volume of education played any crucial part in the British industrial revolution, and we could equally draw attention to examples from throughout the world of places where the education system has hindered development. Examples of this may well be classical China, some of the colonialist education systems, (Alfred Marshall would have held the English upper-class education system of the nineteenth century was a similar case). Some people would argue the contemporary arts-biassed education system of sixth form and university in England now was anti-economic growth. One has to be very careful to separate out arguments about volume and about quality: arguments about education for all from arguments about education for key groups.

Some detailed research has been done on this question in the United States and points to the importance both of widespread general education and of the very skilled immigrant groups who started America on the path to world supremacy. Professor Cremin and Mr. Habakkuk have done signal service in unravelling parts, at least, of that story. As we are lacking any serious historical studies of education, with a few honourable exceptions, we are not in a position yet to assent to, or to deny, the general propositions which have been advanced by economists and historians about the relative importance of education in economic development. One sees the general outline, but the truth lies in the detail.

Certainly when we turn to the developing world a sustained controversy has raged between what one may call those who assign a key role to "the big leap forward" in education, and their opponents. If I may, I will caricature them as on the one hand, the manpower planners, typified in the Ashby Report on Nigeria, and on the other hand those who have criticized the colonialist and neo-colonialist education system for creating a semi-educated urban unemployed population.

Now if we look at this in context, I think we see the outlines of a debate which, at the moment, rages back and forth, about the nature of education's contribution to economic growth, and the reciprocal relationship between education and economic growth. On the one hand, you have those who argue as follows: that as economic growth takes place, skilled manpower plays a critical role in the development of the socio-economic structure; that rough forecasts can be made for the requirements of manpower over the next twenty or thirty years; that these can be re-interpreted into educational categories and that this will give you an outline of the bias which ought to be put into the education system. At the same time, they would acknowledge that the education is expanding greatly, largely because of social pressures for more education. Now these social pressures are not merely a desire for education in itself, they are of course also the quite ordinary economic calculations of ordinary families, that education leads to higher incomes. In other

words, I doubt whether the dichotomy between social and economic demands for education can be justified, and whether broadly this type of demand for education may be categorised as more social than economic. It is the mixture — the nature of the educational provision — which is derived from manpower forecast targets. These manpower forecast targets, interpreted into educational categories, therefore give you what might be called an “ideal” or model educational structure towards which you have to move your existing educational provision.

I say all this without regard to the validity of attempts to forecast manpower requirements, for long periods ahead, and to deduce educational categories and totals from it. There is many a slip 'twist cup and lip, and I think detailed manpower forecasts for long periods ahead have little validity, either conceptually or in practice. The only satisfactory ones, it seems to me, are those for specific types of skill in the short period. Manpower forecasts seem to me to multiply almost all known forecasting errors, and are usually only correct by accident.

Further, the main uses to which the (derived) educational totals are put seem to me to be to put the screws on educational conservatives. The totals are so big, that people are told that the very size of the expansion entails a qualitative change in the provisions.

Now, of course, what is lacking here is to some extent a critical discussion of the content of education. In its most explicit formulation, the discussion is about whether the skills as set out by the manpower planners are actually the kind of skills that society needs. Implicit in the manpower programmes may well be a view of the nature of the future economy and the society which would not be acceptable. And secondly, the discussion is about the implicit values and outlook which is associated with a particular structure of education. In the developing nations the educational system derived from manpower targets characteristically has a larger higher education system, and above all a larger secondary education system, than that which would be derived from the pressure of parents and politicians, which tends to be a more orthodox pyramid in shape. The opponents of this mode of reasoning underlying present manpower plans, and education policies drawn from them, call attention not only to the whole range of extremely dubious assumptions, which are made in devising these manpower targets, but also to the fact that unless the manpower is most carefully fed into jobs in the developing economy, the leads and lags which develop may well be worse than the maladjustments which would arise in an almost uncoordinated development of the education system. Thus, for example, in the Nigerian case, the substantial problems associated with the great growth of primary education, (which, to be fair, are contrary to the findings of the Ashby Report), would be taken as an instance of the over-emphasis on education, which has ultimately resulted from unrealistic manpower targets.

Furthermore, some thinkers would argue that the education system in developing countries ought specifically to be biased in a rural direction, and that the whole emphasis of the manpower planners' approach has been to over-emphasize formal education as against informal education, and to over-emphasize education for urban environments as against education which is truly nation-building. Now if we took this reasoning, which underlies the debate which has been specifically about African education in the last ten years or so, and applied it to Europe, I think we see much the same kind of argument taking place. A similar dichotomy about content and structure is implicit in much of the discussion now going on in Europe.

I must say that it seems to me that there is dangerous over-simplification in the contemporary search for one cause of economic growth, and coming down on education and research as the major element. I have read a great many — certainly not all but a great many — of the books and articles which have appeared on economic growth in the last fifteen years, and the general impression which is left in my mind is that the causes of growth are generally unknown and are extraordinarily complicated. I do not believe for a moment that it is simply expenditure on education or simply expenditure on research and development which causes economic growth, any more than I believe that it is simply investment in physical capital, though I think that view comes nearer the truth than most. This is one of my general reasons for being extremely dubious about the apparent precision and carefulness of all figures in this field.

What, in summary, is the mainline argument that seems to command widespread assent? Education affects social relationships, and it affects people's outlook on life. It gives people general and particular skills. It is the combination of these social relationships, skills and outlooks, with the managerial structure, the government and above all physical capital, which together affects the rate of growth. In other words, my examination of the problem, far from beginning to tease out the individual contributions of individual factors or sub-factors to economic growth, lays emphasis upon the complementarities. I think here, too, I would lay great emphasis upon the fact that one of the major causes of economic growth is the international migration of skills, abilities and technologies. I think that Professor Bruce Williams has made a profound contribution to the discussion of the brain drain and the alleged technological gap between Western Europe and North America, when he emphasizes precisely this point. "R and D is important for growth but the idea that a country's growth depends on its own R and D overlooks the great importance of the international movement of ideas, of machines which embody the results of R and D, and of capital transfers to make possible the use in various countries of technological and managerial inventions made elsewhere."³ One of the things that

³B. R. Williams, *Technology, Investment and Growth* (London: Chapman and Hall, 1967), p. 4.

he is saying is that, insofar as our education broadens and opens the mind to new ideas from other parts of the world, the more likely it is that people in this country will be able to adopt consciously growth-oriented policies (on the assumption that those policies are inherently desirable in themselves, which is an issue I prefer to leave open).

Finally, all the discussion points to the fact that in Britain especially, we have tended to neglect middle-level manpower, and we have tended to neglect the technical orientation of management. There has scarcely been a report in the last twenty years that has not, in one way or another, made precisely that point. Now this is a general argument that I think summarises practically all that the pundits have to say on this point. It is the middle-level person — the average man — who appears too often to have been the clue to economic development. And it is precisely this kind of person that most European systems of education have chosen to exclude in the past, and leave to informal on-the-job training. It follows, therefore, that what America has to teach us has less to do with high-level manpower — where, as the brain drain shows, we do relatively well — but with the ordinary person. I think that a careful reading of Mr. Denison's work confirms that he would share this view, so that at the last, all is reconciled.