

THE ECONOMIC RETURNS TO HIGHER EDUCATION IN TWENTY-FIVE COUNTRIES

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ABSTRACT

During the last decade empirical estimates have become available of the yield of educational capital in a number of countries. In this article the meaning of the phrase 'rate of return to investment in higher education' is explained and then the relevant evidence in twenty five countries is reviewed. A distinction is drawn between the returns enjoyed by the individual and those accrued to the society as a whole, and the results of the comparison are discussed in terms of their implications for public subsidies towards higher education. Moreover, a comparison is attempted between the returns to physical capital and the returns to investment in higher education at given stages of economic development. The result of the comparisons is that in less developed countries the returns to investment in education are well above the returns to physical capital whereas the returns to university education in advanced countries are of the same order of magnitude or even less than the returns to physical capital.

1. Introduction

There are many points of view from which a university can be looked at. One can look at it as an academic institution where students are instructed in various branches of learning, or, alternatively as a source of unrest and rebellion and where major social reforms are shaped. Yet, by removing the academic veil, one could look at the university as a manufacturing firm which produces graduates. Higher education is not different from any other economic activity in which raw material (students, in this case) is processed (through learning) and a final product (graduates) is delivered to the market. The transformation of raw material into a final product costs a certain amount of money which the entrepreneur hopes to recoup by the value added to the material when it is sold in the market. Of course, university graduates are not sold like any other product. However, they command a higher income than secondary school graduates. This extra income can be thought of as a first approximation to the value added to a man by the manufacturing process called "higher education."

There has been much concern recently as to whether higher education is a good economic enterprise for the individual who undertakes it or for the

society as a whole that subsidizes this kind of activity. Are the benefits derived from higher education greater than the costs involved in obtaining it? Does society invest the correct amount of resources in higher education? Could economic development and growth be accelerated by devoting more resources to education? How do the economic returns to higher education compare in developed and less advanced countries? These are the questions we will try to answer in this chapter by reviewing the experience of twenty-five countries.

The theoretical aspect of investment in schooling is presented in section 2 below. This section will serve as a background for the empirical evidence on the returns to higher education given in section 3. The subject of section 4 is a comparison between the returns to physical and human capital in a number of countries. In section 5, the difference between the private and social returns to investment in higher education is treated as evidence of the degree of public subsidization in different countries. Finally, in section 6, the question is asked whether any pattern exists between the degree of economic development and the returns to higher education in a given country.

2. The Economic Evaluation of Investment in Education

The theoretical framework for the evaluation of investment in education is not different from that for any other kind of investment. A stream of benefits is compared to a stream of costs by means of a discounting process. In identifying and measuring the benefits and costs, however, every kind of investment has its own peculiarities. Educational investment is no exception to this rule. In addition, the fact that human beings are the carriers of the investment creates further complications. Therefore, in this section we present the forms of the benefits from higher education, what are the costs involved in obtaining it and how the two measures may be combined into a profitability calculation.

THE BENEFITS

To the layman, the benefits from higher education might appear to be the creation of an intellectual élite. To the economist, however, the benefit from higher education is the additional product resulting from the higher productivity of qualified manpower. How can one measure the increased productivity of a man who has passed through higher education? A straightforward procedure is to compare his earnings with the earnings of someone who has not passed through higher education, like a secondary school graduate. By

subtracting the earnings of the secondary school graduate from the earnings of the higher education graduate one would have an approximation of the value added by higher education. This simple calculating scheme deserves several qualifications. In the first place, a person's earnings do not depend on education alone. Age is certainly another factor, as well as the intelligence and ability of the individual, the location where he lives, his social class, the number of persons in his family, his name, his sex and the wealth he possesses. Therefore, in order to isolate the benefits attributed to education alone one should attempt to compare the earnings of two groups of people which have every other characteristic in common except education. Evidently, this is an extremely difficult task in practice. Test tube experiments are not possible in the social sciences. Therefore, the easy alternative practice has been to compare the earnings of a secondary school graduate and a higher education graduate of the *same age*. In this way one of the characteristics other than education which accounts for differences in earnings is accounted for, but none of the rest. Consequently, the resulting earnings differential would overestimate the effect of higher education.

In order to adjust for this upward bias it has been a practice to reduce the earnings differential, as estimated above, by a certain percentage so as to take into account the effect of other factors and particularly differences in ability. This percentage is usually assumed to be equal to 40%.¹ That is, if the earnings differential between a higher education graduate and a secondary school graduate is £1,000, only £600 is attributable to education.

In order to assess the economic value higher education adds to the individual, one should have a full history of his earnings at different ages. This is seldom possible. Even if it were possible, inflation and changes of the economic conditions would render doubtful a comparison of 1930 and 1970 earnings. Therefore, researchers in this field have relied on cross-sectional data. That is, the earnings differential of a given cohort is observed at a point in time and this differential is assumed to be valid for all people of the same age, either forward or backward in time. In order to make this clear, assume that the earnings differential between the 35 year olds in 1970 is £800. In assessing the benefits from higher education it is assumed that people who are 25 years old today will experience an earnings differential of £800 in ten years' time. Of course, this is a compromise dictated by the data which are usually available for a single census or survey year.²

Yet, a more realistic assumption would be that the earnings differential will grow over time, the reason being that productivity grows in the economy as a whole and in a competitive economy earnings follow this pro-

¹ On the logic of this percentage see Denison (1967, pp. 83–84).

² For an effort to use longitudinal data in a rate of return calculation, see Rogers (1969).

ductivity growth. Economic growth means higher earnings for both secondary and higher education graduates. In case both types of graduates experience the same *percentage* increase in salaries, the *absolute* earnings differential will be higher.

It should be also remembered that the benefits we discuss here refer to the direct monetary ones. Certainly, one can argue that higher education yields both secondary and nonpecuniary returns. An example of the first kind of benefits is the beneficial effect of a university graduate as an informal teacher to his colleagues and which would result in their increased productivity. An example of the second kind of benefits is the creation of a more informed electorate. Although we are aware of the existence of these peripheral benefits of higher education there is no way of quantifying them accurately. Therefore, one has to make the qualification that the returns to higher education, as measured by observed earnings differentials, underestimate the true benefits associated with it.

THE COSTS

To the layman the costs of higher education are the tuition fees, books and related expenses. To the economist, however, higher education costs include the foregone income of students. This distinction between direct and indirect costs of higher education is not obvious at first sight. Yet a 20-year-old person studying in the university actually sacrifices what a person of his age with secondary education earns in the economy. In evaluating investment in higher education the indirect part of the cost is taken from the age earnings profiles of the secondary school graduates.

Some higher education graduates might have stayed in the university more than the official number of years for the length of the university cycle. In this case the costs of producing one graduate would have to be increased as to allow for the repeaters. For instance, if 50% of the entrants into university fail to complete the cycle, then the production of one graduate requires that two persons must enter and therefore the cost of producing one graduate must include the cost incurred by the dropout.

COMPARING COSTS AND BENEFITS

Higher Education costs are incurred for a period of three to five years early in the life of an individual, while benefits accrue over his lifetime. In order to evaluate the performance of investment in higher education one must discount both costs and benefits to a given point in time. Then, by subtracting the costs from the lifetime benefits one has a measure of the net

present value of the educational investment.³

Although this measure is theoretically correct, it is empirically difficult to apply and a little awkward for expository and comparative purposes. The main weakness of the net present value lies in the choice of the discount rate to be used in its calculation. Economists have not yet agreed on the correct alternative rate of interest to be used in the discounting process and the empirical derivation of such a rate deserves a study by itself. The second weakness of the measure is that a statement like "higher education in the U.S.A. has a net present value of \$20,000" does not compare easily with the returns to other investment projects as usually given in terms of percentage yields or rates of return. Instead, a statement like "higher education in the U.S.A. yields a return of 10%" is consistent with investment jargon.

Therefore, it has been a practice to evaluate investment in education by means of the "internal rate of return" rather than by the net present value. The internal rate of return is that rate of interest which equates the stream of benefits to the stream of costs, or, which sets the net present value in the previous calculation equal to zero.⁴ The evidence we will present in the next section on the profitability of investment in education in different countries will be given exclusively in terms of internal rates of return.

PRIVATE VERSUS SOCIAL DISTINCTION

The costs and benefits discussed in the previous sections could be accounted for from two different points of view. First, from the point of view of the individual investor, and, second, from the point of view of society as a whole. In his investment decision the individual is likely to consider only the part of costs he actually earns and only the part of benefits he actually receives. Income tax is an example of benefit which the individual does not realize, although the society does by redistributing the

³ For example, the net present value (PV) of higher education can be found according to the following formula

$$PV = \sum_{t=19}^{65} (B_t - C_t) (1+i)^{-t}$$

where B_t are the benefits from higher education at age t , C_t are the costs of education, i is the rate of interest used in discounting, and assuming that investment in higher education will start at the age of 19 and that the individual will retire at the age of 65.

⁴ That is,

$$\sum_{t=19}^{65} (B_t - C_t) (1+r)^{-t} = 0$$

and where r is the internal rate of return.

proceeds among its members. Public subsidy to higher education is an example of a cost which the society bears but not the individual who counts only what goes out of his pocket and what he foregoes by not being in the labour force.

Therefore, one can have two different rates of return. First, a private rate of return where benefits are computed after tax and costs include only what the individual actually pays or foregoes. Second, a social rate of return, where benefits are gross of tax and costs include the full cost of higher education.

3. The Evidence

It was in the late fifties that the first empirical applications of the investment in human capital theory appeared in the literature. However, the empirical evidence on the economic returns to education continues to be scanty today. The reason is the kind of data needed. Recalling our discussion in the previous section, for a rate of return, calculation data are needed on the earnings of individuals with different amounts of schooling and at given ages. It was only in the U.S. Census of Population that an income question was asked, and thus it is not surprising that the first rate of return studies appeared in the United States.

During the 1960's, however, evidence on the returns to education became available for other countries as well. Where census data were not available, special sample surveys filled the gap and provided the necessary age-earnings profiles. Table I presents the evidence on the returns to higher education we were able to collect. The rates of return refer to twenty-five countries in the 1957 to 1968 period.

In cases where several rate of return estimates were available for a given country we have selected the one thought to be most representative and comparable to the others. For example, we have attempted to choose rates of return before any adjustments for ability or economic growth. The net effect of these two opposite acting corrections on a rate of returns is very ambiguous. Although every effort has been made to secure comparability between the rates the reader is warned that these estimates are extremely rough in most cases and that they are based on very different methodologies and assumptions which are not clear in all cases. For example, only the studies for the United States and Canada are based on Census data. The rest are based on sample surveys ranging from 1,000 persons in the case of the Philippines to 200,000 persons in the case of Germany.⁵

Among the numerous rate of return studies for the United States, we

⁵ The sample size is unknown in the studies for Venezuela, Chile, The Netherlands and Japan.

TABLE I

Rate of Return to Investment in Higher Education and Per Capita Income, by Country*

Country	Year	Rate of return (percentage)		Per capita income in US \$
		Private	Social	
(1)	(2)	(3)	(4)	(5)
United States	1959	9.6	n.a.	2,361
Canada	1961	19.7	n.a.	1,774
Mexico	1963	29.0	23.0	374
Venezuela	1957	n.a.**	23.0	776
Colombia	1965	n.a.	8.0	320
Chile	1959	n.a.	12.2	365
Brazil	1962	38.1	14.5	261
Great Britain	1966	12.0	8.2	1,660
Norway	1966	4.5	5.4	1,831
Sweden	1967	10.3	9.2	2,500
Denmark	1964	10.0	7.8	1,651
Netherlands	1965	10.5	5.5	1,490
Belgium	1967	n.a.	8.7	1,777
Germany	1964	n.a.	4.9	1,420
Greece	1964	n.a.	8.0	478
Israel	1958	n.a.	6.6	704
India	1960	14.3	12.7	73
Malaysia	1967	n.a.	10.7	280
Japan	1961	10.0	6.0	464
Philippines	1966	12.5	11.0	250
W. Nigeria	1967	n.a.	17.0	75
Ghana	1967	n.a.	16.5	233
Kenya	1968	27.4	8.8	111
Uganda	1965	n.a.	12.0	84
New Zealand	1966	14.7	13.2	1,931

* Source: Columns 3 and 4, see text; Column 5, United Nations (1968).

** n.a. = not available.

have chosen the one by Hanoch (1967).⁶ This study was based on a $1/1000$ sample of the 1960 Census of the population. This sample was divided into 24 groups defined by race, region and age and the earnings of the individuals were estimated within each group by fitting earnings functions. The private

⁶ For other profitability of investment in education studies in the U.S., see Glick & Miller (1956); Houthakker (1959); Miller (1960); Becker (1960; 1964); Hansen (1963); Hunt (1963); Ashenfelter & Mooney (1969); Psacharopoulos (1969); Rogers (1969); Weistrod & Karpoff (1968); Lassiter (1966).

rate of return to four years of higher education was found equal to 9.6% for white males in the Northern part of the United States. Podoluk in Canada has used the data from the 1961 Census to compute a private rate of return to higher education (Podoluk, 1965).⁷ This rate was equal to 19.7%. Although the rates of return for both the United States and Canada are "private" they were computed on the basis of income before tax.

The study on the returns to education in Mexico was based on a sample of 4,000 persons (Carnoy, 1967). Both private and social rates of return to higher education were computed and these were equal to 29% and 23%, respectively. The rate of return study for Venezuela is one of the earliest of its kind (Shoup, 1959). The social rate of return to university education was equal to 23% in 1957. Colombia has been the ground of several profitability studies. According to Selowsky, the social rate of return to higher education is 8% (Selowsky, 1968).⁸ The social rate of return to higher education in Chile is equal to 12.2% (Harberger & Selowsky, 1966). The Brazilian rate of return estimates were based on a sample of 1,200 persons (Hewlett, 1970). The private rate, the highest in our sample, is equal to 38.1% and the social rate 14.5%.

Rate of return estimates for European countries did not appear in the literature until very recently. In Great Britain, Maglen and Layard based their estimates on a sample of 26,000 workers in the electrical engineering industry. The private rate of return in their study is equal to 12.0% whereas the social is equal to 8.2% (Maglen & Layard, 1970).⁹ The only study on the returns to education in Norway is due to Aarrestad (1961). Earnings data covered 100% of government employees, teachers, bank and insurance employees, plus more than half of the members of professional organizations. This is the only study in our sample in which the private rate of return (4.5%) is lower than the social one (5.4%). Mr. Leif Magnuson of the Department of Economics, University of Stockholm has kindly forwarded to us his recent rate of returns estimates for Sweden. His study was based on earnings data of over 5,000 employees in the government and private sectors. The private rate of return is equal to 10.3% and the social rate 9.2%. The rates of return for Denmark were studied by Hansen (1969) and were based on earnings data as found in collective agreements. The private rate of return is equal to 10.0% and the social rate equal to 7.8%. The rates of return for The Netherlands incorporate adjustments for ability, labour force participation and mortality (de Wolff & Ruiter, 1968). The private rate of return is equal

⁷ For another study on private net present values by educational level in Canada, see Wilkinson (1966).

⁸ See also Schultz (1968); Dougherty (1969); Camacho (1964).

⁹ For earlier rate of return studies in Great Britain see M. Blaug (1965; 1967); Blaug *et al.* (1967); Richardson (1969).

to 10.5% and the social rate 5.5%. We have computed the rates of return for Belgium based on earnings data of professional workers kindly supplied by Mr. Desaeyere (1969). The social rate of return is equal to 8.7% in that country. The returns to higher education in Germany were based on a very large sample (200,000 persons) (Schmidt & Baumgartner, 1967). The social rate of return is equal to 4.9%.

The rate of return study for Greece was based on household survey data, salary schedules of public sector employees and a sample survey of more than 1,000 people in the Athens area. The social rate of return to higher education is equal to 8% (Leibenstein, 1967; see also Psacharopoulos, 1970).

We have computed the returns to education in Israel based on the present values by Klinov-Malul (1966). The social rate of return is equal to 6.6% in that country. India has been extensively covered by rate of returns studies. The most recent estimates show a private rate of return of 14.3% in that country versus a social rate of return of 12.7% (Blaug *et al.*, 1969; see also Harberger, 1965; Nalla Gouden, 1967). The rates of return in Malaysia were calculated by Mr. O. D. Hoerr of the Development Advisory Service at Harvard University. His study was based on income data of 30,000 households. The social rate of return is equal to 10.7% and it incorporates adjustments for subsistence earnings and non-educational factors. The rate of return study for Japan was based on earnings data of male salary earners in firms employing ten persons or more (Bowman). The private rate of return is equal to 10% and the social rate equal to 6%. In the Philippines the private and social rates of return were found to be equal to 12.5% and 11%, respectively (DeVoretz, 1969).

The social rates of return in Western Nigeria and in Ghana are very similar (17% and 16.5%) (Hinchliffe, 1969). These rates were based on government pay scales. The Kenyan study was based on 4,850 observations (Thias & Carnoy, 1969; see also Rogers, forthcoming). A very large discrepancy appears between the private returns (27.4%) and the social ones (8.8%). The study on the returns to higher education in Uganda was based on government pay scales (Smyth & Bennett, 1967; see also Bennett, 1967). The social rate of return is equal to 12%.

The returns to higher education in New Zealand were also based on the starting salary scales in state enterprises (Ogilvy, 1968). The private rate of return was equal to 14.7% and the social rate equal to 13.2%. These rates contain an adjustment for non-educational factors.

4. The Returns to Physical Capital

Let us now examine how the returns to educational investment compare with the returns to alternative investment opportunities. The importance of this comparison lies in the policy implications which can result, namely, on the kind of investment which should be given priority.

There is some disagreement among economists as to what is the correct criterion rate for such a comparison. Should one use the yield on equity or the returns to manufacturing capital? Should one use the rate of return in risky or relatively safe enterprises? The accepted practice is to compare the private rate of returns to the real borrowing rate in the economy and the social rate of returns to the before tax yield of physical capital.

It should be remembered, however, that both measures are very imperfect. For example, a student might not be able to borrow money at all, even if he is willing to pay a very high rate of interest, as there is no collateral in the case of educational loans. The student himself is the carrier of the investment which forms an inseparable part of him and cannot be repossessed like a mortgaged house. The market for student loans has emerged only very recently in a few countries and has a long way to go before one could finance education as one would finance the purchase of a house. Turning to the social rate of return, the before tax returns to physical capital may be a very poor index of the marginal productivity of capital in the economy. The reason is that the relevant studies are usually based on data taken from the manufacturing sector only and thus are not representative of the economy as a whole. Table II presents a set of alternative rates of return in eleven countries of our sample.

In the United States the rate of return to physical capital in the private sector of the economy (9.7%) is almost identical to the private returns to four years' higher education (9.6%). The before tax rate of return to manufacturing industries in Canada is 12.9% versus a 19.7% private rate of return in higher education. Although a private and a social rate is not available for every country, the reader could easily guess the order of magnitude of the non-available entry in Table I, by reference to other countries where both private and social rates are available. As a rule, the private rate of return is higher than the social rate of return by a few percentage points.¹⁰ Therefore, one could conclude that in Canada the returns to higher education are higher than the returns to physical capital. This also seems to be the case in Mexico where both the private and social returns to higher education are well above the 14% alternative rate. Although

¹⁰ The only exception to this rule is Norway.

TABLE II

Rates of Return to Physical Capital in Selected Countries*

Rates of return are before tax except in the case of the United States where the rate is after profit taxes and probably in the case of Mexico where it is not known whether a tax correction has been made.

Country	Year	Rate of return (percentage)
United States	1959	9.7
Canada	1957	12.9
Mexico	1962	14.0
Venezuela	1958	16.7
Chile	1940-61	15.0
Great Britain	1955-59	8.6
Germany	1955-59	10.4
India	1957	17.5
Japan	1957	20.4
Ghana	1962	8.0
Kenya	1966-67	18.8

*Sources: U.S., Jorgenson & Griliches (1967, p. 268); Canada and Japan, Minhas (1963, p. 87); Mexico and Venezuela, Carnoy (1967, p. 369); Chile, Harberger & Selowsky (1966); Great Britain and Germany, Denison (1967, p. 142); Ghana, Birmingham *et al.* (1966); Kenya, Thias & Carnoy (1969, p. 213).

the same conclusion can be reached for Venezuela, this is not the case for Chile where the 15% alternative rate is above the rate of return to higher education (12.2%). It should be noted, however, that the authors of the social profitability of physical capital in Chile admit that their estimate is on the high side.

As was the case in the United States, the returns to education in Britain (8.2%) seem to be almost identical with the returns on physical capital (8.6%). Although the returns to education in Ghana are above the returns to physical capital, this does not seem the case in India, Japan and Kenya. According to the evidence presented in Table II, the social profitability of higher education in these countries is lower than the returns to physical capital. In interpreting the evidence of Table II, we should conclude that on the average the returns to higher education are at least equal to or greater than the returns to physical capital. The reason is that most of the social rate of return estimates on physical capital were based on the returns in the manufacturing sector of the economy. To the extent that the returns in manufacturing are greater than in the rest of the economy one should conclude that the evidence presented overestimates the true productivity of physical capital and thus the return to higher education compares favourably with the return of alternative investment in most countries.

5. A Proxy for Public Subsidies to Higher Education

Another kind of comparison one could make is by looking at the discrepancies between private and social rates in Table I, above. A private rate of return to investment in education is different from a social rate because a part of the direct costs of education are borne by the State.¹¹ Therefore, the magnitude of the discrepancy between a private and social rate of return would give an indication of the extent of public subsidies towards higher education in different countries. Looking at the countries for which both private and social rates of return are available we observe that the greater discrepancies between the two kinds of rates occur in the developing countries.¹² This is surprising as one would expect *a priori* that the more advanced countries subsidize more heavily their higher education system. This finding constitutes a dilemma for the policy-maker in poor countries and at the same time a possible explanation of intellectual unemployment in those countries.

The discrepancy between the private and social rates shows the extent to which public subsidies for higher education can be reduced while investment in higher education would still remain privately advantageous. The reason is that in developing countries both social and private rates of return are well above the return to alternative investment opportunities. Consider as an example the case of Mexico where a reduction of public subsidies would lower the already high private rate of return, but this would still remain above the yield of alternative investments. In the case of The Netherlands, however, a reduction of public subsidies would result in a private rate of return not very attractive from the point of view of the individual investor. The dilemma arises from the fact that the policy-maker in less developed countries would like to spend *more* on higher education and attract more students in it, in view of the high absolute social rate of return in those countries.

The second point relates to the fact that public subsidization of higher education resulting from high private rates of return creates a distortion in the price system and thus induces more students to enrol at the university than would be socially profitable. Consider the case of Kenya, as an example, where the private rate of return to higher education is 27.4%, the social rate is 8.8% and the alternative social rate is 18.8%. This distortion of the price system can be thought of as feeding the pool of intellectual unemployed in developing countries. To put it in other words, the high

¹¹ Of course, differential taxation rates would also contribute to the deviation between a private and social rate of return, but this is a second order of magnitude when compared with the direct costs.

¹² This discrepancy is particularly pronounced in the case of Kenya, Brazil and Mexico.

private rate of return to investment in education attracts more students to higher education than the economy can later absorb, the result being intellectual unemployment or brain drain.

It should be remembered that the rates of return we have presented are not corrected for unemployment. That is, one would expect that the private rate of return would be lower if the individual takes into account the probability that he would enjoy the benefits of higher education over a shorter period due to unemployment. However, correction of the Indian private rate (14.3%) for unemployment and wastage reduced it to only 11.3%. The obvious puzzle is why the returns to higher education do not decline in the pressure of unemployment? (On this matter, see Blaug, 1969.)

6. Rate of Return Patterns

The question we will ask in this section is whether the rates of return present any systematic pattern when viewed across countries. To put it more precisely, is there any relationship between the level of educational development and the rate of return to investment in higher education?

On the basis of economic theory one would expect an inverse relationship between the rate of return to investment in education and the level of educational development. This is known in economics as the diminishing marginal productivity of a factor of production. If more is invested in machines while all other factors are kept constant, one will get a lower yield per unit of investment. The same relationship is expected to apply in educational expenditures which are similar to any other kind of investment.

Ideally, we would like to have a measure of the educational capital stock invested in different countries. However, there are several empirical difficulties in obtaining this measure. For the purpose of the discussion we will satisfy ourselves with a measure of the degree of economic development of a given country, as a proxy for the degree of educational development in that country. The assumption made is that the higher the level of economic development, the higher also the educational development in the country involved. The common proxy for the level of economic development of a country is the level of per capita income. The last column of Table I presents the per capita income in the twenty-five countries of our sample.

In order to help the reader assess the relationship between per capita income and the social returns to education we have plotted the two variables in Figure 1. A first look at this graph indicates that if there is an overall inverse relationship between the two variables, this relationship is very weak. Excluding the observations for Mexico and Venezuela, the concentration of points indicates that the less developed countries enjoy higher returns to

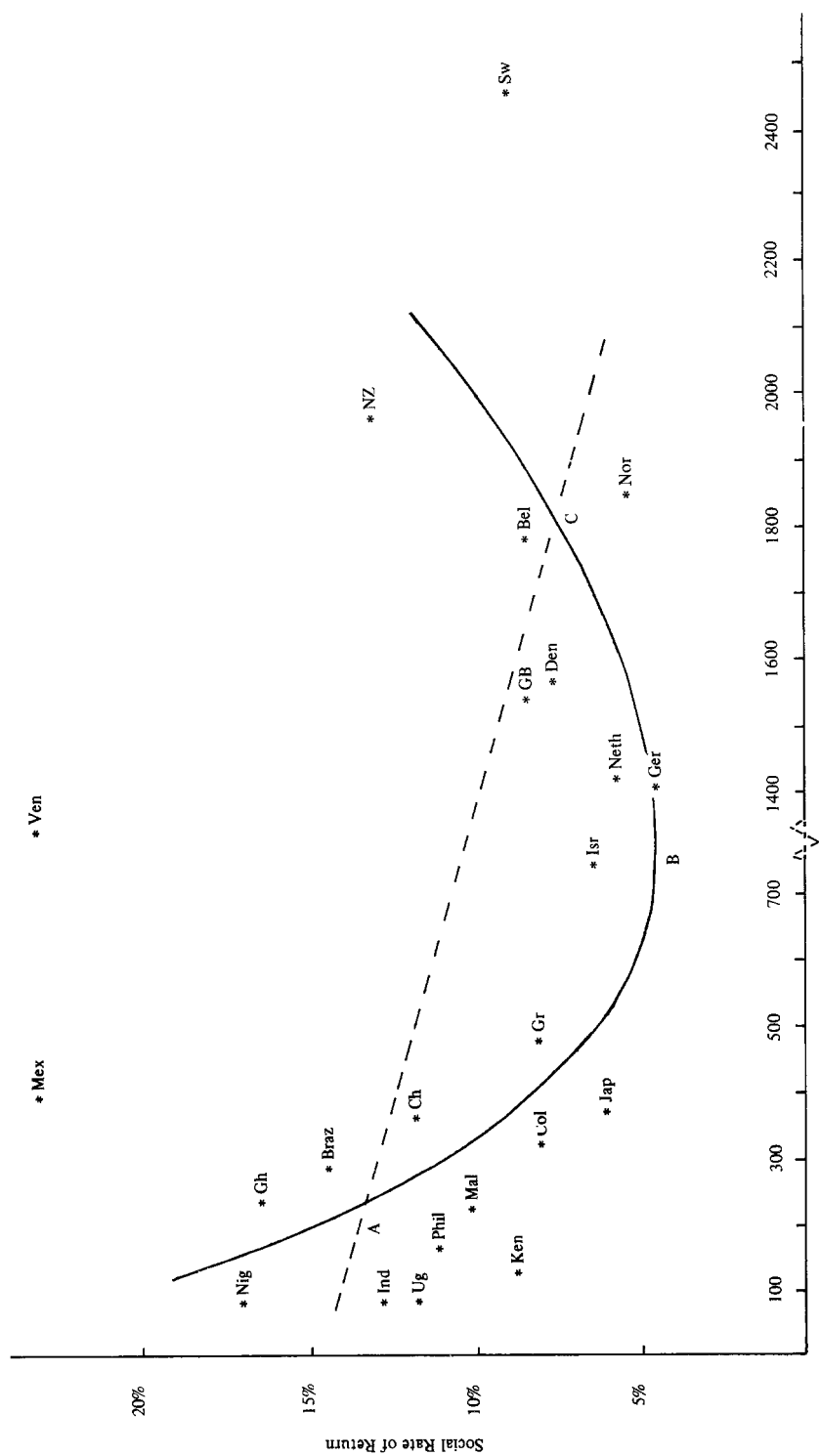


Fig. 1. Social rate of return to investment in higher education and per capita income.

university education than the more advanced countries (dotted free hand line AC).

A more careful look indicates that we are dealing with two distinct sets of countries: those below the \$1,000 per capita income level and those with per capita income above this mark. By disaggregating countries by the level of per capita income one sees a rather distinct positive relationship between the rate of return and per capita income for the seven countries of Western Europe, as suggested by the BC line through these points. On the other hand, the less advanced countries (with the exception of Venezuela and Mexico) show a weak negative relationship between rate of return and per capita income (line AB). Therefore, this graph gives a hint that the rates of return decrease as the level of per capita income increases, until a particular stage of economic development is reached and from that point the profitability of investment in higher education increases alongside increases in per capita income.

The first half of the above U-shaped pattern is consistent with our theoretical expectations, i.e. diminishing marginal returns to investment in education. Our immediate speculation for explaining the second part of this pattern, i.e. the upward sloping BC curve in Figure 1 is that human capital is a complement to the high level of technology employed in the more advanced countries. This view is also supported by time series evidence on rates of return in the United States. Between 1939 and 1959 the rate of return to investment in higher education has been around the 9% mark, in spite of the rapid expansion of the higher education in that country (see Psacharopoulos, forthcoming).

7. Conclusions and Policy Implications

The evidence on the economic returns to higher education in a large number of countries suggests the following:

(a) The *average* level of the returns to higher education seems to be above the returns to investment in physical capital. The general policy implication of this finding is that priority should be given to investment in higher education versus other forms of investment that yield lower returns.

(b) The returns to higher education in less developed countries are higher than the returns to university education in more advanced countries. The policy implication of this finding is that the former group of countries has still unexploited opportunities for increases in national income via educational investment.

(c) Developing countries seem to subsidize their higher education systems more heavily than more advanced countries. The implicit distortion

of the price system tends to generate intellectual unemployment in these countries. However, the dilemma for the policy-maker is whether he should reduce the public subsidy or spend more on a profitable investment opportunity.

(d) As economic growth takes place the returns to investment in higher education decrease. However, one should not yet worry about overinvestment in higher education as university graduates seem to be a complement to the high level of technology employed in more advanced countries.

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LE RENDEMENT ÉCONOMIQUE DE L'ENSEIGNEMENT SUPÉRIEUR DANS VINGT-CINQ PAYS

Résumé

Durant la dernière décade ont été rassemblées des données permettant une évaluation empirique du rendement du capital constitué par l'éducation dans plusieurs pays. Dans cet article on montre d'abord la signification de l'expression de "taux de profit des investissements dans l'enseignement supérieur"; on examine ensuite les données pertinentes dans ces vingt-cinq pays. On établit une distinction entre le profit que l'individu retire de l'éducation et le profit qu'en retire la société dans son ensemble; on discute les résultats de la comparaison du point de vue des subventions publiques accordées à l'enseignement supérieur. En outre, on essaie de comparer les rendements du placement dans l'enseignement supérieur, à des niveaux différents de la croissance économique. Le résultat de ces comparaisons est que dans les pays les moins développés le rendement des investissements d'éducation est bien supérieur à celui du capital physique, tandis que le rendement de l'éducation universitaire dans les pays développés est égal ou même inférieur à celui du capital physique.