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THE PRINCIPLES AND METHODS OF COST-BENEFIT-ANALYSIS APPLIED IN EDUCATION

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SUMMUREY

In this essay, I intend to discuss the cost benefit analysis method of assessment and its application on the individual decision wether to invest in his own educationat or not. I stared the essay by the definition of cost benefit analysis and its general idea and application. The second point is dealing with the cost of education; after that I focused on the returns to education in all its aspects. Also I gave attention to the problems and the difficulties involved in calculating the returns to education. The last point is dealing with the crucial idea in the essay which says: Is it worth while to invest in education from a private point of view ?

DEFINITION OF THE COST BENEFIT ANALYSIS

In order to clarify the concept of cost benefit analysis I would like to set out the following definitions:

1) Mishan (1972) defines cost benefit analysis by saying that "The general question that a cost benefit analysis sets out to answer is whether a number of investment projects A, B, C, D,... should be undertaken and, if investible funds are limited, which one, two, or more among these specific projects that would otherwise qualify for admission, should be selected." (p11).

He points out also that a cost benefit analysis have the task to determine the level at which a plant should operate or specify the combination of outputs that should be produced. (p11)

2) Sheehan (1973) stated that "cost benefit analysis is a method of assessing the economic value of public expenditure projets, taking a wide and a long view of the relevant cost and benefits." (p46).

3) Prest and Turvey (1965) gives an exellent definition of the cost benefit analysis. They say that "cost benefit analysis is a practical way of assessing the desirability of projects where it is important to take a long view (in the sense of looking at repercussions in the further, as well as the nearer, future) and a wide view (in the sense of allowing for side effects of many kinds on many persons, industries, regions, etc...) i.e, it implies the enumeration and evaluation of all the relevant costs and benefits".(p 683).

We can deduct from the three definitions that the cost benefit analysis is a technique which enable us to decide whether any investment is worth while and

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therefore should we undertake it or not? It is in short a tool by which we can evaluate projects and investments and choose the best ones for the community.

Cost benefit analysis has emerged in the literature of economics after the increasing intervention of the government in the economy, and the increasing of public expenditure. It was found that cost benefit analysis could be used as a justification (economically and socially) of the government projects.It could be used also for good decision making in economic and social matters.

Cost benefit analysis was not only used for investment project, but it was even applied to proposed changes in laws, to new pricing schemes and the like. (Prest and Turvey 1965) (p686).

If we ask ourself what is the purpose of the cost benefit analysis, and why bother with it at all. We may find that if we simply value the undertaking of projects just by their profitability we may do some harm to other parts of the society, because every activity have what is called "side effect", "externalities", or "spill over".

Cost benefit analysis is concerned with the economy as a whole, and with the welfare of a defined society and not a part of it only. So by using the cost benefit analysis we can ovoid the negative points of certain projects by choosing the best one for the society. (Mishan 1972 p11).

In education, we find that some economists believe in the utility of the cost benefit analysis for application. For example, Vaisey (1962) says that the application of the cost benefit analysis to education is both possible and desirable. He argues that the application "require first of all a calculation of the annuel costs of education of various types and, then a calculation of the direct, and indirect returns to the investment.

The calculation would show the effect on national output of a given increase in education. This effect is divided into two parts: that accruing to individualq and that accruing to society at large." (Vaizey 1962 p48).

In order that an individual evaluate the profitability of his education, he usually have to know the costs of being on a specific course and the returns and the benefits which he gets from it. Therefore it is wise to start analysing the costs and the returns to education so that we can afterwards judge whether it is really beneficial to undertake a course of study by a student.

THE COSTS OF EDUCATION

The term "cost of education "is difficult to define because it coult be interpreted by many groups. Robbins Report stated some of its definitions. "From the point of view of the institutions concerned the basic element is the cost of providing teaching and carrying out research. From the point of view of local authorities, the cost also includes the payment of loan charges and the provision of awards for the maintenance of the student. From the point of a student, the cost includes any expenditure on fees and maintenance, which is not covered by public awards and, which has to be financed from his own (or his parents resourses; to

say nothing of the fact that his total income as a student will generally be less than if he would have been working.

from the point of view of the taxpayers, the cost may be taken to include not only the taxes which they pay to finance the expenditure on higher education by public authorities, but also the extrataxes which they have to pay because the students do not pay income tax and national insurance contributions. "(Robbins Report app 4 p151).

From my investigation in economics of education, I have found that most of the writers agree that the cost of education for an individual include the financial outlays of the student i.e fees, books, travel costs etc..

Sheehan (1973) believes that the "public policy plays an important part in determining such outlays, and in certain circumtances with full provision of books, tuition,transport, etc.. to pupils the direct cost could be zero." (p.35) .

These financial outlays actually paid by the student or by the government are known as the direct cost to education, and they are quite easy to calculate. (Sheehan 1973) (p36).

There is also the indirect cost which I had found that most of the writers qualify it as the " opportunity cost "or" the income forgone".

Bowman (1966) defines first of all the opportunity cost from an economic point of view. She said: "A generalized concept of opportunity cost can start with very simple definition. The oppotunity cost of choosing a commodity, service or activity "A" (or already having choosen A) are what the individual or group or society gives up (or gave up) in making this choice." (p.422).

From an educational point of view she said: "Opportunity costs are whatever the bearer of the costs gives up, including, for example, the other things that the student cannot buy when he spends his money on tuition or school books. In this fundamental sense "all costs are opportunity costs." (Bowman 1966 p.423).

Sheehan (1973) considers oppotunity cost an indirect cost to education which face any student who choose an educational activity.

The student usually forgone not only the opportunity to work but also forgone the use of his leisure time which is desirable and involves a cost for him. (p.36).

Vaizey (1962) argues that "for student, the alternative to study is often work, therefore, the opportunity cost of education is not only school building, teachers time and so on (which for the most could be used in some otherway) but the time of students which could go into remunerative
employment" (p.42).

This is the case only when the student are over the compulsory attendance age, because young pupils have no alternative; the law forbids them to work. (Vaizey 1962 p.42).

Vaizey (1962) stated some figures which show the importance of the income forgone by the pupils. The Growther Report have estimated about œ 92

million of earnings which would have been forgone in 1958 by pupils aged 15 to 16 if they had been compulsorily kept at school.

In the United states the figures are much more important. For example, Schultz, estimates about 55 per cent of the costs of graduate or professional school education as income forgone; and about 43 per cent of the costs of four year's high school. (Vaizey 1962 p.43).

In the end vaizey (1962) expresses his doubt for including the income forgone in the cost of education. He said that: "the inclusion of income forgone opens the gate to a flood of approximations which would take the concept of national income away from its origins as an estimation of the measurable flows of the economy; if income forgone is added to education costs it must also be added to other sectors of the economy (notably housewives, mothers, unpaid sitters-in, voluntary work of all sorts) (Vaizey 1962 p.43).

In addition to the private cost which involves the financial outlays and the income forgone, there is also the social cost which affect the whole economy. Robbins Report stated that " If there were no higher education, and if all the present students (except for overseas students) were in full time employment instead, then:

a) The resourses of manpower, goods, buildings and equipment which are at present devoted to the services of teaching and research would be available for somthing else, and
b) The total resources of the economy as a whole would be increased by the amount by which the students production as employees exceeded their present production as students. " (Robbins Report App 4 p151).
The social cost or the opportunity cost of higher education to the whole economy was estimated in 1962-63 at œ322 million (R. R p151).

THE RETURNS TO EDUCATION

We know that the education can be regarded as an investment so there must be a return to the students after finishing their studies. There are thow aspects of education as an investment, the private and the social return.

THE PRIVATE RETURN TO EDUCATION

Sheehan (1973) sees the private return as the returns aspects which "considers the relation between the costs incurred by private individuals in obtaining education and the benefits they, as individuals derive from this education." (p.31).

He points out that "the costs are measured by the outlays on fees, books and items incurred by individual as well as the indirect costs of income forgone i.e in order to obtain education a student may have to forgo earnings opportunities elsewhere. These forgone oppotunities are a real cost to him. "(Sheehan 1973 p.33).

Sheehan (1973) believes that the returns to education are "measured by the extra income which he can expect to earn during his lifetime, compared to what he might otherwise expect: if he is deciding whether or not to invest in an increment of education at level N it is the earnings of a person with the (N th) level of education minus the earnings of a person with the (N-1) th level. (p.33).

In real life it is well known that the educated person earns more than the less educated. This sounds true over more or less the whole educational range. In Britain for instance the post-graduates earn more than the graduates, who in turn earn more than the holders of Higher National Certificate, and these differentials have a tendancy to be true for all age groups. (Vaizey 1972 p.62).

If we concentrate now on the individual rates of return in practice we find that the "yields of first level education are very high, parly because of the assumptions used concerning opportunity cost, which are zero to the individual. This leads, according to Hansen to an infinite rate of return (because on individua l's arezero) for education up to the age of thirteen" (Sheehan 1973 p.38).

Sheehan (1973) points out some studies by Becker, Mincer, Hansen and Schultz which show the rates of returns to individual. He said that: "Hansen calculates the rate of return for males as being 14.5 per cent per annum to education between the ages of fourteen and seventeen (corresponding roughly to high school and at 10.1 per cent between the ages of fourteen and twenty one (corresponding roughly to college).

Becker calculates rather hither higher rates of return for the 1949 age cohort, 20 per cent high chool graduates and about 13 per cent for college graduates... In the U.K. Blaug has calculated rates of return to upper secondary (G.C.E.A level) and university education for 1963. After allowing for 40 per cent of differentials being due to non-educational factors, Blaug calculates a rates of return of 10 per cent per annum for three years of upper second-level education (i.e to A levels) and 14 per cent for university education (also three years) "Sheehan 1973 p.39-40).

Another study by Blaug, Peston and Ziderman have calculated the return on G.C.E A levels as being approximatly 8 per cent; the return on university education was 8.5 per cent for a pass degree and 11 per cent for an honours degree.

Other studies have been done by Psacharopoulos, wilkinson and others. For underdeveloped countries, there are some published studies of rates of return in India, Zambia, Kenya, Mexico and Chile. Most of these studies indicate private rates of return in excess of 10 per cent (and sometimes significantly righer) (Sheehan 1973 p.41).

The conclusion which we may deduct from the privious statements that the calculations of the private rate of return to education have resulted in fairly high rates, 10 per cent or more in almost all cases.

The same conclusion was drawn by Ziderman (1973) that the main feature of returns are generally high level. This is shown clearly in table 1 of

average private rates of return on degree education from age 15 in the years 1966/67.

TABLE 1

Males	No ability adjustment	Ability adjustment
First degree	15.0	12.5
Master's degree	15.5	12.5
Doctorate	16.0	13.0
Females		
First degree	20.5	18.0

THE SOCIAL RETURNS TO EDUCATION

Sheehan (1973) stated that "the social aspect considers the relation between costs and benefits accruing to society as a whole. " (p.31) He point out also that " social returns caculations are an attempt to measure the net benefit to society as a whole from investment in education." (p.43)

In most countries education is financed generally by publique autorities; and because the government has many responsabilities in investing not only in education but in other parts of the economy, and also the fact that there is a scarecity of resources it has to be allocated in a rational way.

In this context the government finds that the social returns to education are a significant criteria for resource allocation. The state should, economically, invest in education up to the point where the social returns equal those from other state expenditures and to the social opportunity cost of the capital employed.

There are difficulties of measurment involved in using this method to determine the expenditure priorities, but the social rates of return could be able to offer guidance about the allocation of resources within the educational sector.

The caculation of social returns might indicate, for instance, that a greater social return would be possible from expanding (say) primary education rather than some other level of education (Vaizey, 1972, p.72).

Vaizey (1972) draws attention to the form of calculation for social rates of return which he qualified as the same as in the case of private rates of return. He believes that the difference between private and social rates lies in that is included in the costs and the returns. The returns to an individual from education are calculated from aftertax lifetime earnings differenticials, the social returns are calculated from pre-tax differencials, therefore the same data are used in both process of calculations and the weaknesses of using cross-section data are common to both.

The calculations of returns to education are usually including the direct returns to the immediate beneficiaries but they tend to neglect the external benefits

and cost, for example, those accruing to other than the immediate beneficiaries. (Vaizey, 1972 p.73).

Vaizey (1972) believes that "the application of the term social rates of return " to" measures" excluding externalities is unfortunate, and has given rise to some confusion." (p.73). Therefore, Vaizey, concludes that" calculations of social rates of return rarely include externalities" (p.77).

The same idea was pointed out by Weisbrod (1962) when he said that "most economic analysis of return from education has focused on the contribution of education to earning capacity (and presumably to production capacity) while this has been valuable, it is only part of the picture, and perhaps not even a large part... Empasis on incremental earnings attributable to education dis regards external effects." (p.106).

Now, I have to focus attention on the "external effects" or the "benefits" of education.

THE BENEFITS OF EDUCATION

Weisbrod (1962) believes that education has a lot of benefits which are gained by the student and his parents even without their knowledge of it.

He diveded the persons receiving external benefits from education into three broad groups:

1) Residence-related beneficiaries; "Those who benefit by virtue of some relationship between their place of residence and that of the subject." (p.116).

Weisbrod (1962) focus in this group on the benefit accruing to the family from the education of their children, for intance, in the case of elementary education the schools make it possible for mothers who would otherwise be supervising their youngsters to do other things. He had attempted to make a value of this event, he said: "In March 1956 there were 3.5 million working mothers in the United states with children six to eleven years of age. Assuming that as few as one million of these mothers would not work except for the schools the others being willing to let theirchildren stay with hired persons simply care for themselves, and assuming œ 2.000 as the earnings of each mother during the school year, the value of the child-care services of elementary school may by estimated as roughly £ 2 billion per year. " (p. 117).

Weisbrod (1962) considers also that when the student reaches adulthood and become parent they will benefit from their education because they are going to help their own children by the virtue of the informal education which the children receive in the home.

He extented the benefits of education not only to his family but also to his neighbours. The effect of benefit is assumed by Weisbrod in this way: "by inculcating acceptable social values and behaviour norms in the community children and by providing children with alternatives to unsupervised activities which may have antisocial consequences. The second

is essential of short-period significance during the time the child is of school age... The social values developed in part through his education continue to affect his " neighbours" (p.118).

In addition to the benefits to the neighbours Weisbrod (1962) finds that education has the effects on those who pay (directly or indirectly) for the consequence of the lack of education, for instance, as far as the lack of education leads employment difficulties and crime, law enforcement costs will tend to be high. Therefore education provide social benefits by reducing the need for incurring these "avoidance costs" to the advantage of taxpayers. (p118).

EMPLOYMENT-RELATED BENEFICIARIES

Weisbrod (1962) stated in this context that "the education of one worker may have favorable external effects on the productivity of others. Where production involves the co-operative effort of workers, flexibility and adaptability of one worker will rebound to the advantage of others. Productivity of each member of the group influences the productivity of each other member. In such a case, each worker has a fiancial interest in the education of his follow workers." (118).

BENEFITS TO THE SOCIETY IN GENERAL

Some of the benefits from education are easly identifiable but some of them are distributed broadly, so that it is difficult to identify specifically the beneficiaries of them, for instance, literacy. Weisbrod (1962) believes that "literacy is not only of value to the individual possessing it, and to the employers, but also is of value to others.

Without Widespread literacy the significance of books, newspapers, and similar media for the transmission of information woulf dwindle; and it seems fair to say that the communication of information is of vital importance to the maintenance of competition and, indeed, to the existence of a market economy, as well as to the maintenance of political democracy." (p.119).

DIFFICULTIES INVOLVED IN MEASURING THE RETURNS TO EDUCATION

There are some difficulties which are encountered when undertaking the measurement of the returns to education. I shall discuss some of them in this chapter.

Sheehan (1973) believes that in order to perform the calculation of the rate of return, we have to refer to the age-earning profiles, i.e a series of earnings figures for various age intervals throughout the prospective working life of an individual. The problem which arises here is that we have to convert the cross-section data into time-series earning and this is not valid only when the relevant

variables are stable over time, but this not the case because the time is forty years or more (the working life span) (Sheehan 1973 p.50.)

Vaizey (1972) find that "in deriving the rate of return of an investment, made in year t in education E, one need the rate the excess earnings of those with education E over those of pepole with some lower education D, in each of the year t+2...t+n, where n is of tlhe order of the magnitude of 45 years, this data is not, and clearly could not be available and second-best material has to be substituted" (p.63).

There is another problem which has been pointed out by many economists of education such as Vaizey (1972) and Sheehan (1973).They say that there is evidence that earnings differentials at any one time are affected by cyclical factors. Reder has shown that skill differentials tend to narrow during periods of excessless demand for labour and broaden during slumps. Even if we would choose a "Neutral" year in the cyclical sense we would be faced by the fact that the data often comes from sources (e.g censes) whose timing is outside the investigator's control. (Vaizey, 1972, p.64, Sheehan, 1973, p. 51).

There is an assumption in education which says that the higher earnings are caused by education which people receive. This question has given rise to a large amount of controversy, we try here to summarize some of them.

Sheehan (1973) for instance, say that" there are factors other than education which are undoubtedly associated with earnings differentials. The classification of a population according to categories of race, religion, geography, family size, "natural" ability, sex, family or social class background, parental income or wealth, occupatio, education of parents etc...will in most cases show some association with earnings differentials, even, if this not as strong in all cases as a comparison with educational levels" (p51).

He points out also that the usual way to hold the other variables constant, but the problem is that there are so many independent variables, and it is so difficult to measure the effect of each one of them separately, and also if we assume that we do so, the labour involved in the necessary statistical operations would be very great. (Vaizey, 1972 p.52).

Blaug (1970) draws attention to the difficulties found in assessing the effect of the different variables, he said that: "The degree to which all of these factors are intercorrelated, so that the effort to measure one of them frequently picks up the effects of some of the others. (p33).

Sheehan (1973) argues that some of the studies have over stated the effect of education on earnings. He said that "In the United Kingdom, the Plowden Report has investigated the social and educational aspects of primary schools, and has found that between schools the variation in educational performance of children (which was significant) was largely due to non educational factors. Over one-third (35 per cent) of the difference was unecounted for, 17 per cent was due to the state of the school itself and the remaining 48 per cent was due to parental attitudes and home circumstances" (Sheehan, 1973, p.54).

He draws attention to the fact that the findings of Plowden report does not directly contradict the Wolf-Smith survey or invalidate the adjustments made to the rate of return by Denison, Becker and others, but it does show how important non-educational factors are in determining educational performance and therefore it prove how difficult it is to assert that education has a large influence on earnings or school performance. (p.54).

In this context, Blaug (1970) said that" The evidence about the pure effect of education is still far from complitely convincing." (p.45).

There is another problem arizing when measuring the returns to education which is termed the "consumption-investment" problem. Vaizey (1972) explain this problem in the following quotation: "The difficulty in this case is that rate of returns analysis treats education as an investment, where as to many individuals education is at the same time a

consumtion expenditure...thus as education is (partially) consumption not all the costs incurred should be included when calculating the rate of return, in particular, of course, income fargone ceases to represent the opportunity cost" (Vaizey, 1972, p.66).

The calculations of social returns are not safe as well, if we try to calculate them for a specific society, we may find as many difficulties as in the calculation of private returns. Vaizey (1972) points out that "all the difficulties encountered in the private calculation,recur, and there is in addition measurement of external benefits to contend with. There are also the difficulties of adjusting ruling salary levels for for labour market imperfections" (p.77).

In addition to what was said previously, we found that Sheehan (1973) argues that it is not possible to use the indirect and intangible aspects of education in cost-benefit analysis, because of the difficulties of quantification found in calculating the returns to education. (p.49).

The last problem which we want to emphasis upon it is the difficulties involved in calculating the opportunity cost or the income forgone while attending an educational course Schultz (1960) have made an

attempt to study how to calculate the income forgone, and therfore he expressed the diffirent difficulties emerging from its caculation. He said that "student's forgone earnings were calculated on the assumption that, on the average, students forgo 40 weeks of such earnings, and then expressed in earning-equavalent weeks of workers in manufacturing in the United states. They indicate that high school students forgo the equivalent of about 11 weeks and college or university students about 25 weeks of such earnings. These 1949 earnings ratios were applied to particular years between 1900 and 1956; and adjustment was then made for unemployment." (p.573).

Schultz, (1960) find that there are two sorts of limitations which need to be taken in consideration he said that "the first 11 weeks and 25 weeks estimates for the base year 1949; the other is inherent in applying the 1949 relationships to other years" (p.573).

Further more he points out that" many of the young people who did work in 1949 were employed for only a few weeks during the year. It seems plausible that their earnings per week would be below those of workers of equivalent abilities who worked most forall of the year. To this extent, our estimates are too low. (p.573).

Another difficulty which face the estimates of earning forgone is that it could be possible for a student rate to be somewhat higher per person in the particular abilities for which earnings are received than do those not in school who are earning income.

In this case as such differences are existing dispite other things being equal, the estimates of earnings forgone are again too low.

Also there is the situation when some students have held jobs while they were attending school, the earning they have received from such jobs should have been subtracted from the estimates of earnings forgone. (Schultz, 1960, p573).

IS IT PROFITABLE, FOR AN INDIVIDUAL, TO INVEST IN HIS OWN EDUCATION ?

Some people think that education at the age of fifteen is just a consumer good, the cost of this extra education is simply the income forgone since fees are charged in secondary school. But in fact, very few parents and even fewer students take additional education as just another consumer good to be enjoyed for its own sake. There are some social surveys of the attitudes of parents and students which reveal the importance of vocational opportunities opened up by additional education, and job expectations which almost have an extreme importance above all other motives in the decision to stay at school beyond the compulsory leaving age. (Blaug, 1970).

In addition, Sheehane (1973 says that an individual is seeking education in order to improve his capacity of earning in the future, therefore he has to decide whether to stay in school or to leave (after the compulsory age) in a "rational" economic way which consist of comparing the costs of, and prospective returns to various possible amounts of education open to him. The appropriate rate of return measures the "value" of education to the individual and this is compared to the cost" of education.

This relationship as mentioned by Sheehane (1973) will determine the amount of education demanded by the individual. (Sheehane , 1973, p.55).

In this context, Blaud (1970) stated that "We are assuming that people acquire extra education only when the job oppotunities and the associated life time income stream that it is expected to create outweigh the value of the time and resources that will have to be invested" (p.171).

Some economists have tried to set out some sort of "rational" economic calculus to determine the criteria on which the individual could invest in education

according to it. They define the concept "rational" as a "continual conscious (or unconscious) comparison of rates of return. "(Vaizey, 1972, p.66).

Vaizey (1972) pointed out in this matter that "this view of "rational" person is supposed to invest in an education for himself up to the point when the internal rate of return from that education is equal to the rate of interest reflecting his subjective time preference" (p.67).

So if one take the example of a 15 year old boy in England he would ideally discount the extra earnings he would expect from studying on the sixth form and, comparing it with the costs to him in remaining at school, then calculates the rate of return. Unless this exceeded his time preference rate he would leave the school. Such calculations are clearly not made because of the lack of information. (p.67).

The conclusion drawn by Vaizey (1972) about this problem is that "the evidence on the demand of education is not necessarily inconsistent with the hypothesis offered by an economic calculus but neither is it inconsistent with others" (p.67).

Further more Vaisey (1972) deducted how he realize, the question of investment by individual in education. He said that "the question whether people base demands for education on some calculus of the type, outlined in the cited studies, is a point incapable of resolution at the moment. This is not to say that earning factors do not enter into decisions made by individuals about their education. It is just more probable that people weigh up, in some crude and emotional way, various kinds of factors, and make a lunge at a decision." (p.69).

After emphasasi ıg the attitudes of an individual towards investing in his own education, I wo d like to docus now on the assumption-in economics of education-which says that i is more profitable to invest in human capital rather that in physical capital. Psacharopoulos (1973) belives that the comparison between the returns to physical and human capital was the main concern and interest of the economics of education in the sixties. (p.79).

there have been many attemps from authers to do a comparison of their results in return to education with alternatives rates to other forms of investment. Psacharapoulos (1973) points out that "the conclusion of these case-study comparisons fall into three categories. First, studies that have yielded extremely high profitability estimates for investment in education by any standard (e,g Mexico, Venezuela). Second studies that show returns of the order of magnitude of the yield on alternative investment (e.g Canada, Kenya). And finally, studies with rates of return lower than those earned elsewhere (e.g the Netherlands, Germany). The authors of the first set of studies have not much difficulty in sustaining the argument that investment in education is superior to other forms of investment. Even authors of the last type of studies have supported the superiority of investment in education, if by nothing elese than bringing in the external and non-monetary effects of education." (p.80).

Psacharapoulos (1978) has provided some statistics on investment in both sector, educational and physical capital. Before, he proceeds to the comparison of these statistics to known which investment is the more profitable; he asks two questions which are in relation to the comparison; 1)"Are individual educational investments advantageous from the private point of view".
2)"Do societies allocate the correct amount of resources to the educational sector".

He argues that "if the private rate of return to a given level of education is higher than the private rate of return to alternative invetments we can say that individuals investing in the former have made a good choice.(p.82).

He confess as well that the profitability estimates to alternative forms of capital in Table1 are social and not private, but as he said" we can bias ourselves against investment in human capital and compare social alternative rates with private educational rates form Table2" (p.83).

Table 1

Rates of return to investment in physical capital in certain countries (percent)

Country	Year	Rates of return
United States	1959	9.7
Canada	1957	12.9
Venezuela	1958	16.7
Mexico	1962	14.0
Chile	1940-41	15.0
Britain	1955-59	8.6
Netherlands	1955-61	16.8
Belgium	1955-61	4.4
Germany	1955-59	10.4
India	1960	12.5
Japan	1957	20.4
Ghana	1962	8.0
Kenya	1966-67	18.8

Table 2

Social and private rates of return by educational level and country (percent)

SOCIAL

Country	Year	Primary	Secondary	Higher
United States	1959	17.8	14.0	9.7
Canada	1961	. .	11.7	14.0
Venezuela	1957	82.0	17.0	23.0
Mexico	1963	25.0	17.0	23.0
Chile	1959	24.0	16.9	12.2
Britain	1966	. .	3.6	8.2
Netherlands	1965	. .	5.2	5.5
Belgium	1964	. .	. .	9.3
Germany	1964	. .	. .	. .
India	1960	20.2	16.8	12.7
Japan	1961	. .	5.0	6.0
Ghana	1967	18.0	13.0	16.5
Kenya	1968	21.7	19.2	8.8

PRIVATE

Country	Year	Primary	Secondary	Higher
United States	1959	155.1	19.5	13.6
Canada	1961	. .	16.5	19.7
Venezuela	1957	. .	18.0	27.0
Mexico	1963	32.0	23.0	29.0
Chile	1959	. .	. .	. .
Britain	1966	. .	6.2	12.0
Netherlands	1965	. .	8.5	10.4
Belgium	1964	. .	. .	17.0
Germany	1964	. .	. .	4.6
India	1960	24.7	19.2	14.3
Japan	1961	. .	6.0	9.0
Ghana	1967	24.5	17.0	37.0
Kenya	1968	32.7	30.0	27.4

The results of Psacharapoulos (1973) was is favour of investement in education. His findings were that out of twelve countries for which his comparison was made. He found that only four the returns to physical capital were higher

than the private returns to human capital. It was the case for Britain, higher education in Germany and both secondary and higher education in the Nederlands and Japan. In all other cases, the private return to any educational level was higher than the returns to alternative forms of investment. (Psacharopoulos, 1973, p.83).

Taking the second question, Psacharopoulos (1973) argues that it is not easy to claim the superiority of educational investment over investment in machines from the social point of view.

His findings were that "out of the twelve countries examined, seven show higher returns to physical capital for at least one level of education. This is the case for secondary education in Canada, higher education in Chile, India and both secondary and higher education in Britain, The Netherlands and Japan." (Psacharopoulos, 1973, p.83).

CONCLUSION

From this essay, we can conclude that it is profitable-economically -to invest in education from an individual point of view. At this stage of sophitication in economics of education, it is fairly difficult to prove, in a tangible way, the profitability of an investment in education over the alternative investments. This is because of the technical problems of measurement found in evaluating the costs, returns, benefits of education; nevertheless, there are enough convincing arguments which show that the investment in an individual education is highly profitable.

If we come now to the method of cost-benefit-analysis and its application in economics of education, we find that a lot of economists of education believe in the possibility to use it in education despite its limitations which are seen in the difficulties of quantification.

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