# PART I

## INTRODUCTION

## EDUCATIONAL ATTAINMENT

# Chapter I

# INTRODUCTION

## Importance of Human Capital

There is a growing interest among economists in the development of a theory of human capital which would complement the theory of physical capital, and enable the theory of capital as a whole to make a more satisfactory contribution to our understanding of such question as the nature and process of economic growth. This trend of development has compelled us to recognise the economic aspects of education, health and other welfare measures which contribute to the formation of human capital.

The exclusion of human capital from the perview of the concept of Capital is responsible for many a pitfalls in the theory of economic growth. The acceptance of human capital into the concept of 'capital' may help in solving many unexplained problems in the process of economic growth.

Two important determinants of economic growth are capital and labour. The conventional definition of capital confines only to reproducible material goods which excludes capital formed by expenditures on education, health etc. The definition of labour also confines only

2 to the number of man-hours worked and as such labour is treated capital free. These definitions of capital and labour as is evident, have failed to explain fully the observed economic growth in many countries. According to Schultz, "Although it is obvious that people acquire useful skills and knowledge, it is not obvious that skills and knowledge are forms of capital, that this capital is in substantial part a product of deliberate investment, that it has grown in western societies at a much faster rate than conventional (non-human) capital and that its growth may well be the most distinctive feature of the economic system. It has been widely observed that increases in national output have been large compared with the increases of land, man-hours and physical reproducible capital. Investment in human capital is, probably, the major explanation for the difference."[1] The un-explained part of economic growth was considered as 'Residual'. How to attribute this large increase in output to a residual? According to Schultz, "both labour and non-human capital have become essentially empty shells and thus it should not come as surprise that this game has not explained growth."[2] The treatment of residual in economic growth as a technological change has also not taken into account an array of new factors of production those have been introduced and the quality of factors that has been improved in the economy. Schultz is of the view that the large residual is simply

3 a bias of the analytical approach most economists use. What is the logical basis for attributing this residual to technological change? If the logical basis is absent then naturally in attributing residual to any factors, "other than technological change," what becomes important is the factors that are omitted. The omitted factors are (i) an introduction of an array of new factors of production and (ii) the improvement in the quality of old factors. Equating technological change to residual in economic growth has not taken note of the contribution made by the additional productive services from the sources (i) and (ii). Schultz has called this as bias and to correct this, he has pleaded for the development of all inclusive concept of capital including the economic productivity of education.

The role of human capital in economic growth has been viewed as a factor contributing to economic growth. It has helped to solve one of the riddles of the problem of identification of observed economic growth. Here, investment in human capital by raising the capabilities of individuals as productive agents is treated as improving the quality of labour. However, the story does not end here; granting that investment in human capital contributes to economic growth has not trickled down as expected. On the contrary both the socio-economic objectives of economic development viz., (i) more egalitarian distribution of personal income

and (ii) poverty alleviation, have not only been amiliorated but aggrèvated. This has led the economists to search for a strategy which can not only speed up economic growth in terms of increased national income but also ensures redistribution of income in favour of less privileged and poor. This strategy emphasises on labour intensive technologies, export oriented trade, rural development, broad based skill formation and the development of physical and human capital endowment of poor. I.L.O's basic needs strategy may be viewed as an extension of the above spelled-out growth strategies. Basic needs strategies confines to the provision of primary education, health facilities and food to the poor. Thus it is very clear that for the redistribution of income and removal of poverty human capital occupies an important place in this revised growth strategy. For redistribution purpose, it is not necessary, all the time, to rely on taxation policy. People are poor because most of them lack the ownership of productive assets such as land, in less developed countries. Similarly, in a developing economy where the changing skill requirements affecting the employability of persons it has been thought proper to provide non-physical assets to the poor to improve their economic and social lot. The root of this strategy of redistribution with growth lies in the above ideology.

5 Early History

Though the theory of human capital was developed and nourished during the later part of the 20th century, i.e., 1960 onwards, some English thinkers have recognised human capital in one way or the other.

Evidently the mercantilists had some sort of appreciation of the investment in man idea, for they laid great stress on the importance of 'art and ingenuity of skilled manpower as a key to growth in national wealth, and William Petty even attempted to measure human capital.[3] But merchantilists had as yet no system of economic thought, no analytical framework for doing this.

Adam Smith and Marshall recognised the importance of human skill and educational investment. Adam Smith was probably the first economist to compare an educated man with machine, and laid the foundation for the concept of human capital. He said, "The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labour and which, though it costs a certain expense, repays that expense with profit.[4]

Major contribution to the concept of human capital came from Alfred Marshall. He accepted the notion of human capital evolved by Adam Smith, that expenditure on education is investment expenditure and educated persons are the part

of the wealth of nations. In his own words, "we have already defined personal welath to consist firstly of those energies, facilities and habits, which directly contribute to making people industrially efficient, if they are reckoned as welath at all, they are also reckoned as capital. Thus personal wealth and personal capital are convertible and it seems best to follow here the same course as in the case of wealth... to raise no objection to an occasional broad use of the term, in which it is explicity stated to include personal capital."[5] He was familiar with the concept of 'capital' developed by Irving Fisher[6], which could include the expenditure on human beings as investment expenditure, even then Marshall excluded these expenditures on the ground that the human capital lacked the market place, i.e. it could not be bought and sold in the same manner as physical capital. The promise of future higher earnings could not be used as colateral for the financing of investment in human capital. We do not want to dwell upon here on the reasons for the neglect of the further development of the concept of human capital, particularly in the context of the growth theory till 1960, when not only the neo-classical theory of human capital was formulated, but became an integral part of our discipline.

Then came Keynesian revolution with the publication of his book, "Gereral Theory of Employment, Money and

Interest", in 1936. In the Keynesian frame work the expenditure on formal education by household or even by the state has been viewed as consumption expenditure. In the Keynesian theory the definitions of consumption and investment are dependent on the behaviour of expenditure unit and not on the nature of the goods purchased. The effect of this revolution was such that for quite long time the thinking on human capital was totally absent or the concept of human capital itself went into oblivion.

Neo-Classical Theory of Human Capital :

The neo-classical human capital theory developed since 1960 is the basis of the strategy of redistribution of income with growth. The theory treats expenditures on education, health, on the job training, job search, migration etc. as investment expenditures. These expenditures form human capital. Individuals embodying this form of capital are more productive than others. In a perfectly competitive market where factor rewards are based on productivity of factors of production, more productive people will earn more than less productive people. This theory in this sense justifies the prevailing income distribution, however, uneven. It also implies that by investing more in the education or health or training of the less privileged, they can be made as productive as better off sections of the society and thereby

income distribution can be altered in favour of these groups. This is precisely the reason why education and health are viewed as 'merit' goods, and their provision has become the responsibility of state, which has a crucial role to play in welfare economics.

Of late, the neo-classical theory of human capital has been a target of attack from the radical economists who are not ready to assign productive role to education in the same way as stressed in the above theory. The labour markets are segmented. The concept of dual labour market has also floated. The presence of segmented and dual labour markets suggest that individuals with equal investment in human capital may be treated unequally. The labour market discrimination may be one of the reasons why the less privileged are less responsive to the free provision of education. This raises the question whether by reducing human capital discrimination one can reduce labour market discrimination. Also, whether it is the human capital discrimination that preceeds the labour market discrimination or it is the other way round.

The above narration of the development of the theory of human capital has prompted us to undertake this study to review scientifically some of the issues that have come up over time regarding this theory. We are examining the issue of the growth and distribution of

human capital in its various manifestations in the framework of human capital theory.

Importance of Education and Health in Human Capital

It is self evident that human capital theory is dominated by 'education' - one important form of human capital. We come across estimates of the stock of human capital formed through investment in education.[7] Similar estimates formed by health expenditure are not only rare but are not attempted so far, particularly in a country like India.[8] No doubt this is a gap in the estimation of the stock of human capital and better it is bridged soon. Unlike other forms of human capital say, on the job training, migration, job search, education and health belong to a special category. In case of first three forms OJT, migration, job search, the benefits are more personal and so, costs and returns are largely borne and accrued to individuals or firms. Human capital formed by these agents do not seem to have wider social implications, unlike in case of education and health.

If we take note of the recent onslaught on economics of education that it is not productive at all and only OJT is productive, then the entire thrust on the socio-economic implications of the growth and distribution of the stock of educational capital gets weakened. Whether education is productive or not does not appear to be a must

10 question. On the other hand, the basic question is - what is the critical minimum level of human capital required to give a much needed push to its size (stock) and through which forms of human capital? Can one acquire this minimum critical level of human capital? Does that level depend on the stage of development of a country, its manpower needs and socio-economic goals? But education and health are undoubtedly catalyst to the acquisition of critical minimum level of human capital. Formation of human capital through OJT, migration and job search in this regard are subservient to education and health. These two forms of human capital are the foundations on which the super structure of human capital can be built. Brain migration (Brain drain) is confined to highly educated and that enhances the value of human capital already formed through investment in education. Thus, formation of educational capital preceeds the formation of all other forms of human capital.

The theory of human capital from the view point of a household has shown that the position of two curves - demand and supply of funds for investment in schooling - varies from one group of individuals to the other. For the disadvantaged or less priviledged section of population the position of these curves will be far to the left of that for the privileged group, indicating thereby, that the less privileged are not going to be benefitted as much from the investment in schooling as the privileged.

These two groups constitute non-competing groups. Because of labour market imperfections in the form of internal and external markets (segmented labour markets), and discrimination, the less privileged are destined to acquire not necessarily small amount of educational capital (as well quality) but other forms of human capital also.

It has been observed that a great barrier for rapid advancement in underdeveloped countries is the wide spread existence of ignorance, illiteracy and lack of training on the part of their work force. Professor Myers and Harbinson have said, "the broadening of capacities of man, the existence of his knowledge and the upgrading of his skills may lead to the best available road to economic development which results only from action. Hence improvement of educational level of work force is essential for the development of under developed countries."[9]

The accumulation of equipment is wasteful unless accompanied by investment in human capital. In a stimulating contribution Dr. H.D. Gideouse writes, "If we ignore the fact that labour as a productive force derives its value from the investment of capital in the form of in-service training and formal education it is impossible to understand comparisions of economic growth in U.S.A. and U.S.S.R.[10] Also Professor S. Chakravarty writes,"to

12 complete the Indian agrarian transition, public investment will have a leading role to play in the form of providing infrastructure as well as in providing necessary research and development support. In addition there is the need to upgrade the quality of human agents through appropriate investment in health, education and nutrition."[11] In so far as the difference is due to education it contributes directly to production. An educated labour force is necessary to reap, the advantages of large scale production. Changes in capital intensity is accompanied by the changes in the educational level of labour force with a determined level of education.[12] Scientific knowledge is helpful in bringing about innovations which change the volume of production. An educated labour force can learn quickly the higher level know-how from foreigners who come specifically to guide the people in new line of production. This is important because the technique of production in under developed countries is to a very large extent imitative in character.[13]

## A Review of the Literature on the Stock of Human Capital in India

It will not be out of place here to take note of various estimates of human capital (educational capital) made by various scholars and research workers in

13 India. Of course, majority of them have followed a methodology where educational capital was treated synonymous to human capital.*

Panchmukhi (1965)[14] calculated the entire investment in education including on the job training and called it "educational capital". According to him in 1959-60 educational capital in India was Rs. 8,170/- million. In terms of per capita, it was Rs.19/- and per member of the labour force it worked out to be Rs.43/-.

Professor V.N. Kothari (1966)[15] estimated educational capital for the years 1950-51, 1956-57 and 1959-60. He has followed a methodology of Professor T.W. Schultz and calculated factor cost of education for the above years. It was a first study of its kind. He has made upper estimates as well as lower estimates of educational capital. In 1950-51, 1956-57 and in 1959-60 the upper estimates of educational capital were Rs. 3330, Million, Rs.5858 million, Rs.8305 millions respectively and the lower estimates were Rs. 2513 million, Rs. 4470 million and Rs.6370 millions respectively.

Nallagoundan (1967).[16] estimated human capital considering unit cost of education. According to him the educational capital in the country in 1960-61 was to the

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* We would be justified in using the term educational capital as human capital since education is unquestionably the largest source of human capital.

1.14 tune of Rs.73,343 million. It worked out to be Rs.167 per capita and Rs.389 per worker (member of the labour force).

Berman (1970)[17] estimated educational capital to the tune of Rs.12,440 million. He has not made any reference to the population or labour force. This resulted perhaps in a very low estimate of educational capital in India.

According to Psacharopoulous (1973)[18] the educational capital was around Rs.59,245 million in India in 1961. In per capita term it was Rs.135 and per member of the labour force it was Rs.315.

Tilak (1987)[19] estimated the stock of total human capital in the State of Andhra Pradesh for the year 1971 and it worked out to be Rs.25,896 million. Per head of population it was Rs.595 and per member of the labour force it was Rs.1,438. He also estimated stock of human capital by sex i.e., male/female and by caste i.e. SC/ST, Non-SC/ST.

The stock of human capital embodied in men was Rs.24,247 million and in women it was Rs. 6,182 million i.e., the stock of human capital in men was four times higher than in case of women. In case of SC/ST group human capital embodied by it was Rs.312 million whereas in case of Non-SC/ST group it was as high as Rs.10,893 million. The stock of human capital was also estimated for the labour force. Tilak called it Active human

capital. The stock of active human capital was Rs.14,389 million in 1971 and per member of the labour force it was Rs.799.

Estimates of the stock of educational capital in India are aggregate in nature.* What in fact required is the disaggregate estimates i.e. by caste, region and sex to have a feel of the impact of the policy of positive discrimination. Not only this, but in a historically inequitious society like ours, if this policy has prevented further worsening of the inequitous structure (apart from making it more equitious) that itself is an achievement. Thus, the importance of the problem at hand viz., the growth and discrimination of human capital can not be over-stressed.

These estimates of the growth of educational capital in India during the first 15 years of Planning are worth examining. Estimates of Panchmukhi and Kothari for the year 1959-60 do not vary much. Similarly, estimate of Nallagounion and Psacharopoulous for the year 1961 are comparable. But the latter estimates are seven to eight times the former. In 1950-51, the stock of educational capital estimated by these authors (Panchmukhi and Kothari) was in the range of Rs.305 to 314 million. Even in 1960-61, the stock so estimated amounted to Rs.770 and Rs.831 crores (minimum and maximum estiates respectively). This gives the decennial growth rate of about one and a half

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* Stock of human capital was estimated either for a region or country as a whole. No attempt had been made to give the estimates region-wise, sex-wise and caste-wise. Only one study i.e. Tilak's study has made an attempt like this. But even it was confined to only on State-Andhra Pradesh- and at a point of time, i.e., for the year 1971.

16 times (or an average annual growth rate of roughly 12 per cent). According to one estimate which has covered a period upto 1965-66 the growth of stock of educational capital since the beginning of planning is higher at more than 13 per cent per annum.

Most of the studies undertaken so far by individual scholars have based their estimates on costs of education particularly. The term human capital in their studies connotes investment in education. Human Capital formation through health has not been considered. The main objective of their studies was limited. They made comparative analysis of the growth of physical capital and human capital and drew some inferences for policy formulations with respect to allocation of resources.

The limited objective of their studies in the early 1960s and 1970s served one useful purpose of maximising growth by reallocating resources in favour of that capital which is likely to contribute relatively more to the economic growth in aggregate. So their focus was on the relative contributions of human and physical capital to economic growth.

Later developments have reduced the significance of this limited objective. Investment in human capital is expected to serve many other ends than simply promoting economic growth. Economic growth may or may not percolate. It is believed that investment in human capital of certain

17 sections of population may help achieve the objective of growth with distribution. So simply comparison of the growth of two types of capital may not serve this broad objective. The estimation of human capital to highlight this broad objective involves many refinements to which we shall turn later in this chapter.

This implies that we need to estimate sex specific, region specific and caste specific stock of human capital. In that case if we estimate human capital by cost or earning, both cost and earnings should be sex specific, caste specific and region specific. This is a stupendous task. As is known, such a detailed cost or earnings information is rarely available in published form. Even if available, it calls for many adjustments to suit our purpose. In this study we propose to do this as far as possible.

18 Glossary of Terms

The term 'Education' refers to education imparted in the formal educational institutions (i.e. formal education only).

We excluded the 'Literate' population from our definition of education for population and labour force. The definition of a 'literate' person adopted by the census is one who can read and write. This definition is modified in the recent census of 1991, where a 'literate' is defined as one who has completed 5 or 7 years of formal schooling and not who can just read and write. The reason is, 'literates' defined earlier may lapse into illiteracy as most of the children may dropout from schools within a year or so after enrolment. So when we decided to exclude 'literate' population and labour force from our estimates of the stock of human capital we had possibly this reason in mind. We have taken persons with completed elementary education possessing 8 years of schooling, persons with completed secondary education possessing 3 years of schooling and persons with completed college and university education possessing 4 years of schooling. Thus, a person having university degree has acquired a total of 15 years of schooling, whereas, a person having secondary education has acquired 11 years of schooling.

'Health' in our study covers the public and private expenditures incurred on preventive and curative health services. This exclude the expenditure incurred on such

.19 other items like sanitation, pure drinking water, and environmental balance.

.The term 'Factor' cost or 'Resource' cost consists of (i) Recorded public expenditure which is classified into direct and indirect expenditure (ii) recorded private expenditure on education such as tuition fee, examination fee, other fees and endowments. These expenditure figures (i) and (ii) are available in the published form in the volume entitled "Education in India" brought out every year by the Ministry of Education now Ministry of Human Resource Development. Hence we call this as recorded expenditure on education, (iii) Private expenditure on education which is unrecorded i.e. (unpublished) cost of education. This covers non-tuition private cost of education and the opportunity cost of education. The two components of opportunity cost included in our study are (a) earnings foregone and (b) interest foregone. Thus, the 'factor' or the 'resource' cost structure comprises six types of costs : (i) Public cost of education (ii) Private tuition cost of education (iii) Private non-tution cost of education (iv) earnings forgone (v) Interest foregone (vi) imputed cost of education (interest and depriciation on buildings).

Typology of Human Capital.

Our main objective in this study is to estimate the stock of human capital or the stock of educational capital

20 and health capital. For our purpose we have followed the typology of human capital elaborated below :

(1) Unadjusted nominal stock of educational capital both in the population and labour force

(2) Adjusted nominal stock of educational capital both in population and labour force
The adjustment factors used are (i) educated unemployment (ii) Wastage and stagnation and (iii) Brain drain.

(3) Both the stocks (i) and (ii) above are estimated in real terms i.e., constant prices (1961-62 =100)

(4) Apart from examining the growth of the stocks of human capital embodied in population and labour force during planning in India, we also are interested in examining the question of the distribution of these stocks by sex, region and caste. So we estimated the stock of educational capital seperately embodied in male/female, rural/urban areas and, in SC/ST and non-SC/ST population. These stocks are also examined at constant prices. These stocks are unadjusted as necessary break up of data required for adjustment are not available.

(5) Per capita stock of educational capital at current and constant prices.

21 (6) Finally an attempt is made to estimate the stock of health capital

Hypotheses

(1) Human capital formed through expenditure on education and health has a tendency to grow at a faster rate than that of physical capital as well as national income.

(2) Equal educational attainment (in terms of number of years of schooling) does not mean equal investment in education, in particular. This may be taken to understand that the quality of the stock of human capital by sex, region and caste may vary.

(3) The participation rate of educated labour force tends to be higher than that of the aggregate labour force. The labour force participation rate of educated persons tends to vary by sex and region.

(4) The growth in productivity of labour and the earnings of labourers are more due to the growth of the stock of human capital. The increase in social demand for education in India has been more guided by investment motive.

## Methodology Followed

In estimating the stock of human capital (educational capital), we have calculated the average annual factor or social cost by level of education, i.e. expenditure incurred by government and private households on education of the students at various levels of education.

To work out the factor cost of education for completed level of schooling, the average factor cost is multiplied by the completed number of years of schooling, e.g. at the elementary level of education the average cost is multiplied by eight, which is equivalent to eight years of schooling completed. In case of secondary level of schooling the corresponding average cost is multiplied by three, which is equivalent to three years of schooling completed. In case of higher level of education the average factor cost is multiplied by four, which is equivalent to four years of schooling. Thus, a person with eight years of schooling has invested in education the amount equivalent to eight years of factor cost, of elementary education, the person with eleven years of schooling, (elementary + secondary) in addition to the investment of eight years of factor cost of elementary education has invested the amount required for the completion of secondary education i.e. three years of schooling, a person with fifteen years of schooling, in addition to total investment at elementary plus secondary level of education has invested amount needed for the

completion of four years of college/university education.

The factor cost thus, arrived for each completed level of schooling is multiplied by the number of persons in population and labour force with elementary secondary and higher level of education for given bench mark years.

We have estimated two stocks of human capital or educational capital; unadjusted stock of human capital without any adjustment for the factors like wastage and stagnation, educated unemployment and brain drain. The other is adjusted stock giving allowance for the above factors.

Sources of Data

The most authentic sourceof information on enrolment and expenditure on education is the yearly publication "Education in India" volumes I and II published by the Ministry of Education, Government of India. The overall stock of educational capital can be rather easily estimated on the basis of the above document. However, the estimation of stock by caste and region poses some problems because of non-availability of data, e.g. the break up of enrolment and expenditure for urban area seperately is not available. We have estimated enrolment and expenditure figures for urban areas by subtracting those available for rural areas from the aggregate figures. Caste-wise (SC/ST and Non-SC/ST) break up of these statistics are not available in these volumes after 1960-61. For private non-tuition cost of education one has to conduct a survey as no published information is readily available. For an individual researcher a nation-wide survey obviously is out of question. So a sample survey locally is normally conducted to collect the information on the private cost of education. Such sample surveys may not necessarily be representative.

For the information on the educational attainment of population and labour force by sex, region and caste, one has to rely on census volumes of 1951, 1961, 1971 and 1981. The information given in these volumes has not

been consistent e.g., in 1961 census, unlike the censuses of 1951, 1971 and 1981 information on educational attainment for matriculation and graduates was clubbed together as matriculation and above. This poses the problem of comparison and classification. As is well known the census definition of a 'worker' has undergone changes. This also raises the problem of comparison of labour force statistics. In view of the above data limitations at many places in our study while estimating the stock of human capital we have to make many assumptions.

Chapter Scheme :

The entire study is divided into four major parts and 8 chapters.

Part : I

Chapter I : Introduction

Chapter II : Educational Attainment of Population and Labour Force

Part : II

Chapter III : Public Expenditure on education Expenditure is given in aggregate as well as level-wise. It also provides informationcon sex-wise, caste-wise and region-wise public expenditure.

.24 Chapter IV : Private cost of Education

In this chapter the information is on non-tuition private cost and opportunity cost. Level-wise as well as sex, region and caste wise.

Part III : Estimation of Stock of human capital and its distribution by caste, region and sex and also health capital.

Chapter : V Stock of educational capital is estimated both in adjusted form and unadjusted form.

Chapter VI : Distribution of stock of human capital by sex, region and caste.

Chapter VII : Stock of health capital and the measurement of labour product.

Part : IV

Chpater : VIII Conclusions and Summary

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