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National Open University
School of Social Sciences

MEC-108
Economics of Social Sector and Environment

Block

2

ECONOMICS OF EDUCATION

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BLOCK INTRODUCTION

The present block (Block 2) on Economics of Education has three Units (Units 4 to 6) each focusing on the issues of Demand, Supply and Determinants of Education respectively. **Unit 4** begins by making a distinction on how education is both a 'consumption' as well as an 'investment' good. It then examines the characteristics of education to make it a 'merit good' at the school level but a 'quasi public good' at the higher education level. Given this, how important it is to promote education for achieving the objectives of economic development, how vital is 'human capital' for economic growth but how even more critical it is to use education as an 'instrument' for enhancing the 'capabilities' of people to advance the larger objective of 'human development' is then explained. Making a distinction between the issues of 'private' and the 'social' demand for education, the unit then delineates the concepts behind the measurement of cost of education. The unit concludes by pointing out how education has come to be used as a 'signalling devise' in the labour or employment market in the economy.

Unit 5 emphasises the criticality of 'funding' in establishing the educational institutions. Given that there is a crucial need for both the government and the private institutions to operate in harmony in the education sector, what factors goes into balancing the budget equations of the two entities are then explained. In what respects is the educational sector fundamentally different from the conventional 'goods producing' sector, and in its light, how the conventional 'production function' approach does not apply to the education sector is then discussed. The unit finally deals with the alternative models of public private partnership (PPP) in establishing joint management mechanisms in the education sector.

Unit 6 deals with the 'determinants' of educational services from both its demand and the supply side. Having explained the different factors which operate from both these dimensions, the unit draws on some 'international experiences' to indicate how alternative sources of funding mechanisms have been evolved to forge a required integration for meeting the objectives of the 'private demand' with the 'social demand' for education. The conditions for achieving the equilibrium levels of investment in education, under the two main approaches viz. the elite and the egalitarian approaches, are finally discussed.

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UNIT 4 DEMAND FOR EDUCATIONAL SERVICES

Structure

4.0 OBJECTIVES

After reading this unit, you will be able to:

- discuss whether education is a public good or a merit good;
- explain how education is both a 'consumption good' and an 'investment good';
- describe the role of education in economic and human development;
- explain the concept of the Capability Approach propounded by Sen;
- distinguish between the concepts of 'private demand' and 'social demand' for education;
- delineate the concepts behind the measurement of costs of education; and
- state the alternative approach to 'human capital' theory by way of Spence's theory on signalling.

4.1 INTRODUCTION

Economics of education refers to the application of economic principles in the field of education. Its scope spreads across several areas of economics (like labour/public/welfare economics) interfacing with those of 'theory of economic growth' and 'development economics'. Although the importance of education to economic growth and development was recognised by Adam Smith as early as in 1776, the discipline of 'economics of education' emerged as a formal area of study with the work of Theodore

W. Schultz around 1960. The central argument of Schultz was that human capital is basically formed by education and training and it is therefore an important factor of production. The idea was further developed by Gary Becker (1964) to explain why individuals invest in education and training in a manner similar to investment in physical capital. More recent work on endogenous growth theory by Paul Romer (1986), Robert Lucas (1988), Richard Barro (1999), etc. have demonstrated the contribution of human capital by relating it to 'increased productivity' with the expenditures incurred on 'innovation and R & D'. Against this background, the present unit deals with the issue of demand for educational services with a focus on the concepts of 'measurement of costs' of education.

4.2 EDUCATION AS A PUBLIC GOOD

In the taxonomy of 'goods', in the first instance, goods are broadly classifiable into private and public goods. A private good is defined as a good characterised by rivalry in 'consumption' and excludability in 'benefits'. This means one person's consumption reduces its availability to others and those who do not pay for it can be excluded from its consumption. A public good, in contrast, is defined as exactly opposite in its characteristics to a private good i.e. it is non-rivalrous in consumption and non-excludable in benefits (Samuelson, 1954). But goods satisfying these two characteristics unconditionally are taken to be 'pure public good' (e.g. national defence, light house). In the Samuelson's definition, free rider problem remains i.e. non-rivalry leads to none being excluded and hence all those who consume or draw benefit will not necessarily pay for it. In view of this, in order to decide whether education is a public good or not it is essential to go beyond the strict boundaries of a 'pure public good'.

In the case of education, since it is produced by both government funded as well as by private funded institutions, in order to decide whether it is a public good or a private good, we must look beyond the ownership of production and into its market characteristics. Here, externality is an important feature of education. Consumption of a good by one person might result in a positive or negative effect (called externality) on others. Education, besides rendering the private benefits of increased income and lifestyle to the individual, generates benefits (positive externalities) which spills over to society. It thus generates societal benefits which is important to be considered by the government for deciding the extent of its own direct involvement and/or its indirect role in terms of policy formulation and regulation.

Kaul and Mendoza (2003) argue for an expansion of the definition of pure public good into two levels. In the first level, any good characterised by its 'potential' for either actually being or desired to being non-rival and non-excludable (like a legislative provision to be made available to all) is considered. This gives the societal benefit a higher weightage. Once this is satisfied, as is for education, at the second level a complementary characteristic on whether the good is *'de facto* public' is considered i.e. whether the good is 'potentially non-exclusive and available for all to consume' is taken into account. The distinction is therefore between a good's 'potential for being inclusive' and it 'actually being inclusive'. Thus, whether a good should be publicly provided or not will not merely depend on its specific features (like the educated persons being more productive) but it would also have to be seen from its political and social dimensions. For instance, the political dimension could be to allow educational institutions to function as 'corporate institutions' (i.e. by allowing them to generate profit as also to create a competitive atmosphere) and the social dimension, (i.e. considerations of equity), could be to either allow institutions to function as 'minority institutions' or make legislative provision for reservation on socio-economic considerations in admission to both the publicly and

privately funded institutions (both situations as exist in the Indian context). Policies are to be so framed that they enhance the availability of such public goods by compensating for the creation of such goods which the markets may not adequately create by itself (Marginson, 2007). Neo-classical theory downplays the *potential* for externalities and looks to market competition for establishing an equilibrium level for goods demanded by the consumers ignoring the actual production of most public goods.

In the context of education, for our present purpose, it is useful to dichotomise it into 'basic education' and 'higher education' [although in its strict sense education consists of three levels viz. primary, secondary and tertiary where, under 'tertiary', both higher education and vocational and technical education (VTE) are included]. By strictly adhering to the neo-classical definition of public good, 'education in general' qualifies only as a private good. But keeping in mind the immense positive externalities that education generates for society as a whole, 'basic education' though rivalrous is sought to be made non-exclusive (by legislations like the RTE Act in India) making the denial of education an 'offence'. Thus, basic education is a *de facto* public good. What is underlined here is that one has to go beyond the mere 'publicness' in the consumption of a good and examine the two distinguishingly important features essential to have a complete assessment of the benefits i.e. potential and actual. The term 'merit good' coined by Musgrave is important in this context as in the case of 'basic education' the role of state is always very high in view of its high societal benefits as compared to the private benefits.

Merit Good and Mixed Good: A merit good is a good having positive externalities. In a free market economy, merit goods are both under-produced and under-consumed for two main reasons: (i) when consumed, a merit good creates positive externalities creating a divergence between private benefit and social benefit; and (ii) individuals are short-term utility maximisers who do not take into account the long term benefits of consuming a merit good. Therefore, merit goods when produced by private sector institutions, may not be relied upon to provide adequately to serve the needs of the community. For instance, while the school education would be considered worthwhile for being set up by the private sector in urban areas to cater to the needs of the upper and the middle class population, only the public sector has to assume the responsibility of catering to its requirement of vast poorer sections of the society. In other words, merit goods are goods judged as desired to be had by all the individuals in the society on the basis of a concept of 'need' rather than the 'ability and willingness to pay'. The concept was originally introduced in the late 1950s by Richard Musgrave who in case of education argued that those lacking education are incapable of making an informed choice about the benefits of education thereby warranting a role by the state to provide the same compulsorily to all sections of society. In later years, higher education came to be considered a 'mixed good' or a 'quasi-public good' i.e. essentially a private good with positive externalities accruing to the society as a whole (Musgrave and Musgrave, 1989 & Marginson, 2007). Mixed goods thus combine the characteristics of both public and private goods with the market demand being derived as the 'sum of the private demand and the social demand'. Bridges and Jonathan (2003) argue that efficiency conditions should be sidestepped and the importance of societal demand should be given weightage to regard higher education also as a 'public good'.

Experience Good/Trust Good: Education is also argued to be an 'experience good' as the true assessment of its quality is feasible only after it is consumed. In other words, students while undergoing the process of attending and interacting with peers and faculty/ teachers experience and learn such soft skills which they later benefit from while facing the challenges of job market and society. The uncertainty of benefits from education is

rendered further complicated by the information asymmetry inherent in education. In view of this, Jongbloed (2004) argues that education is like a 'trust good' as trust remains a critical aspect given the asymmetries with which the students have to chose an educational program and make investment in it with the expectation of deriving a better income later in life. Stiglitz (2000) regards education as a 'publicly provided private good' because education is both rival and excludable as seats are limited in educational institutions particularly in privately funded ones. It is also a fact that depending on the objective and interest of a student (i.e. whether one wants to acquire education for its own sake – for the sake of knowledge – and not necessarily with the expectation of future income stream), education is also both a 'consumption good' as well as an 'investment good'.

Positional Good: In case of goods produced in higher education, outputs like degrees and certificates might carry a 'status benefit' depending on the brand of the institution. Higher education goods in this sense are 'positional goods' as institutions seeking to improve and raise their status would compete to attract the best students and faculty, mustering social power in the process. Thus, 'values' which are subject to both rivalry and excludability are generated by private institutions even when similar education might be provided either entirely free or substantially subsidised by the state (e.g. number of general under-graduate colleges run by the government in India). However, with the emergence of free universities (e.g. open access system where course material of a university is made freely down-loadable) in the market, the concept of 'open access knowledge' is contributing to broadening of access and flattening of social distinctions thereby enhancing the characteristics of non-rivalry and non-excludability in education. In other words, higher education is becoming both potentially 'rivalrous and non-rivalrous' as well as both 'excludable and non-excludable' i.e. they are interdependent related in a positive sum fashion. This is pointed out to be the critical difference between the neo-classical definition of public good and private good.

Global Goods: Outputs of education obtained by cross-border admissions, carrying the brand of a positional good with individualised status (i.e. foreign degrees), are classified as 'global goods' (Marginson, 2004). Since such degrees are expensive, they reduce the characteristic of 'publicness' by narrowing the size of the beneficiaries. In view of this, education in the context of globalization, can be called as 'global public goods' defined as being characterised by non-rivalry and non-excludability and broadly available on a global scale. Besides such degrees, cross-cultural exchanges and activities, communications and understanding at international levels serve as illustrations for 'other public goods'. Stiglitz (1999) argues that such 'other public goods' (i.e. other than formal higher education and research) are examples of 'global public goods'. In the current overarching framework of WTO, higher education is treated as a 'tradable good'. With multiple government and international agencies involved in such a framework, Marginson (2004) argues that all autonomous 'higher education institutions' (HEIs) must work towards creation of both public and private goods. The debate on treating school level of education, due to its enormous benefits to the society, as a merit good and higher education, due to its nature of being rivalrous in consumption (in view of the paucity of number of seats in the HEIs) as a mixed/merit/quasi-public good has come to occupy an important place in the literature on economics of education.

4.3 NATURE OF DEMAND FOR EDUCATIONAL SERVICES

In an effective sense, demand refers to the choice that individuals make between different goods and services that are available in the market at a given price. The demand for

education also, in a similar way, refers to the desire to participate in education with the ability to pay for at least a part of its cost. The latter, besides meeting out the cost by own resources, could be even in terms of foregoing the opportunity cost of wages lost by having to attend the school. However, defining demand for education, by applying the general theory of demand, is not possible as there are some critical issues involved. First, the demand for education is not merely a relationship between the quantity demanded and price. Rather, it is a relationship between a complex set of institutions in the education system on the one hand and the society (with its iniquitous character among different social groups) on the other. This makes the determining of the price of education different from determining the price of commodities channelled through the markets. Second, due to the nature of education being a public (or merit) good, there could be exclusion of some segments from the education market (i.e. the condition of non-exclusion required to be satisfied for a pure public good being not uniformly satisfied across different levels of education). In other words, the earlier view held on education being a 'public good' (on par with national defence, internal security, etc. and exclusively funded by state) has since changed to quasi-public and even a merit good in view of the fact that the universal free educational service provided by the government is also limited in their level and capacity. This is particularly because of the differences in the quality of education between the public and private sector institutions due to which even families of low income households may like to send their children to privately managed schools. Third, to the extent that the production of such goods result in positive externalities, a few consumers who could afford by virtue of being economically well-off can take advantage of education without contributing in any way to its production or in terms of the services to the society. In other words, there would be some *free-riders*. The two attributes of externalities and education being a public/merit good means that there is 'market failure' leading to divergence between the social and private costs of education as also in their benefits. Fourthly, to the extent the relationship between education and society (in terms of benefits) is not one-sided (i.e. the benefits of education would positively influence society and increase the demand for education due to perceived individual or private benefits), a situation of 'endogeneity' (or simultaneity) arises. All these factors make the relationship between education and society complex making it different from conventional goods traded in the market for which the general theory of demand (applicable to a good where market failure situation is absent) in terms of variables like price, income and quantity can be applied.

4.3.1 Consumption Good and Investment Good

The question that therefore arises is whether the demand for education is to be analysed in a consumption or an investment framework. The estimation of demand for educational services vary depending on whether it is treated as a consumption good or an investment good. As a consumption good, it provides immediate satisfaction to the consumers, whereas as an investment good, it helps them in increasing their earnings in future. Viewed as a consumption good, education is demanded to enhance the human capability (i.e. to fulfil the necessary functions of leading a normal social life like using public transport, finding a street address, checking a bill in a restaurant). This approach takes into account the money costs of enrolment in relation to current tuition charges and other enrolment costs (taken as a proxy of the price of education). The investment approach to educational demand considers that an individual will pursue education if the 'expected benefits' from education exceeds the cost of acquiring education. The expected benefits include lifetime earnings and social and intellectual amenities while the cost of acquiring education includes expenses in the form of tuition and other fees, living costs and other incidentals. It also includes opportunity cost measured as the loss of income incurred by the students while they are in school or college. Hence, the

decision to demand education under the investment approach mainly depends on the expected 'rate of returns' to education. It will be demanded so long as the expected rate of return exceeds the market rate of interest and will be foregone otherwise. In other words, the demand for education is positively related to the expected rate of returns and negatively related to the market rate of interest.

4.3.2 Private and Social Demand for Education

Viewed from the consumption or investment frameworks, the demand for education can be categorised as: (a) individual or private demand and (b) social demand. While the private demand is defined as the enrolment in an educational system, the social demand is defined as the aggregate of individual demand (i.e. the total number of persons enrolled in an educational system). Thus, while the private demand for education is estimated by the data collected at the household level, the social demand for education is determined by taking the aggregate data at a state or the country level. For instance, the study on impact of economic condition on demand for education at individual level will include the family or household income while at the country level it would include the National Income. The social demand approach treats education as a service demanded by the community (just like any other good and service) and regards educational planning as the process of forecasting demand to establish adequate institutional arrangement to meet the demand.

Check Your Progress 1 [answer the questions in about 100 words in the space given]

1) Why is 'externality' an important feature of education?

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2) What are the two important characteristics of a 'private good'? For deciding whether 'education' is a public good, why is it necessary to go beyond the definition of a pure public good?

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3) What is meant by 'de facto public'? How is the consideration of this complementary characteristic useful in policy formulation?

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4) Do you agree that 'basic education' is de-facto public? Justify your answer.

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5) Distinguish between the terms 'merit good' and 'mixed or quasi-public good'.

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6) State three reasons as to why 'education' is not amenable to the application of the general theory of demand?

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7) What is meant by endogeneity in the context of demand for education?

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8) What is the underlying thrust in the consumption approach to analysing the demand for education?

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9) On what basic rationale the investment approach to analysing the demand for education rests?

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10) What type of data is required to estimate private demand for education? What is its relation to the data required for estimating the public demand for education?

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11) What does 'educational planning' basically entail?

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4.4 EDUCATION AND DEVELOPMENT

Investment in education is desired by individuals and also by the State because it is through education that the individuals not only enhance their productivity but also broaden their horizon to contribute to the good of the society. Education is demanded for the holistic development of the economy, which includes not only a rise in incomes through productivity improvement of individuals but also for removing the inequalities in society, reducing poverty and hunger, enabling better participation of citizens in their community, etc. The importance of education for economic growth and development was well recognised by many classical and neo-classical economists. For instance, Ricardo's (1817) work established that increase in economic well-being of the masses is possible either with a diminution of the population or an augmentation of capital and for both education is the means to achieve. Malthus (1826) focused on the benefits of limited family size and for this favoured education as a means of inculcating necessary habits which would also ultimately lead to economic development. This view was carried forward by J.S. Mill (1848) to argue that an effective national education of the children of the labouring class is the first thing needed for the economic development of the nation. Marshall (1890) too referred to education as a national investment to argue that the most valuable of all capital is the investment made in the development of human beings. There was, thus, significant recognition accorded by classical economists to the subject of economics of education supporting the role of education in promoting social peace and harmony, self-improvement, and wealth creation. Notwithstanding these views of early economists, the debate on whether education should be considered as a sort of consumption continued owing to the argument that limited resources should be spent on directly productive and growth oriented areas like infrastructure and therefore the expenditure on crucial social sectors like education and health continued to be classified under 'consumption'.

The acceptance that the expenditure incurred on education (and health) amounts to investment in 'human capital' formation came about, as stated in section 4.1 before, with the human capital theory advanced by Chicago school economists like Schultz & Jorgenson (1961), Denison (1962), Becker (1964), etc. These economists demonstrated with empirical evidence that education constituted a key factor in improving the countries' economic growth and development. In particular, employing the data on national income for the US economy for the period 1929-58, Denison explained the sources of economic growth by balancing the factors of production with the total output. His findings revealed that out of the average annual rate of growth of 3.9 percent, 1.6 percent was accounted for by capital and 1.0 percent by labour. The residual of 1.3 percent (R) on which he further focused upon led him to conclude that it is attributable to the quality of workforce (measured for a composite set of factors like 'health, fitness, experience, skill and

educational attainments'). By breaking up the rate of increase in labour quality into three constituents L_E, L_A and L_W (the three standing for educational achievement, changes in labour quality attributed to age and gender composition and changes due to varying average work weeks respectively), Denison could deduce that changes in labour quality accounted for over fifty percent of the annual growth in the residual growth with nearly forty percent of the change in R, the residual growth, attributable to changes in L_E. Denison's work was furthered by Jorgenson for the period 1958-73 (and later to 1974-88) which highlighted the significance of quality of labour to growth. The residual analysis could not decipher whether the educational levels were profitable at a point of time from a macro perspective. In other words, the exact margin of benefit for the individual and the society was not clear. Further, the diversity in specialisation accounting for varying degrees of economic value generated by the variety of educational programmes also could not be captured by the residual analysis approach. To overcome these limitations and to estimate the life time returns on alternative investment in education, the method of 'cost benefit analysis' (CBA) was developed. More recent work by Romer (1986), Lucas (1988) and Barro (1999) further highlighted the fact that countries with educated and skilled manpower can have better economic progress as compared to the countries with less educated people. The mechanism through which education was considered to influence growth and development was by productivity increases and generation of externalities. In other words, higher levels of education would be conducive to higher levels of marginal product in the economy which would further help to increase the gains in productivity for the whole economy. Amidst this understanding, the 1990s brought to fore the critique of the role of growth in promoting development to argue that measuring economic growth in terms of GDP alone does not convey much about the distribution of income in the society. Although the initial shift from the income-centric approach to the human development approach started way back in the 1970s (with the World Bank's concern on the distributional aspect of income that emphasized on the need to provide direct provision of public services as complementary strategies in improving the well-being of the people), it was in the 1990s that the human development approach took into account the other important dimensions of development like political freedom, guaranteed human rights and such other ingredients of self-respect. Human development is, therefore, much more than mere economic development and is concerned in its approach on people, opportunities and choices. Thus, while the human capital theory was based on production of skilled workforce achieved through the medium of education to lead to economic growth, the human development theory ploughed ahead to identify the essential gaps to be bridged in order to create an environment in which people can develop their full potential to lead productive and creative lives in accordance with their own needs and interests. In other words, education has many externalities like better healthcare, greater community and political participation, crime reduction and lowered income inequality which were not adequately captured by the earlier economic approaches to education.

Until mid 20th century, it was assumed that investment in physical capital is adequate to augment the economic growth and therefore saving and investment in physical capital was considered the key to economic growth. According to this view, due to diminishing marginal product of capital, poor countries having low initial physical capital stock can reap higher rate of return on investment as compared to countries having higher initial physical capital stock. However, despite this argument, the convergence in growth rates did not always happen leading to question the theory of investment in only physical capital as the key to economic growth.

John Kendrick found out that for the U.S. economy, over the period between 1889 and 1957, the combined input (labour and capital) index increased at an average rate

of 1.9 percent per annum whereas output index rose by 3.5 percent per annum. Thus, the remaining 1.6 percent was attributable to all such residual factors not accounted explicitly. He categorised the residual contribution as a percentage increase in output per unit of labour input. Later, Robert Solow (1957) attributed the residual growth in output to technological change, assumed to be exogenous and un-embodied in human labour.

Schultz (1961) established that the income in the US economy grew at a faster rate than 'the amount of land, man hours worked and stock of reproducible capital' combined together. He attributed this discrepancy to the improvement in human capacity by investment made in education. This improvement in human capacity, which he called human capital, could explain not only the increasing returns to scale in production, but also the improvements in the inputs, leading to higher economic growth. By increasing returns to scale here is meant that when individuals invest in their human capital, the rate of growth in income will be higher than when merely the non-human capital (like land, man-hours worked and stock of reproducible capital) are employed. Moreover, the quality of non-human capital also increased when human capital is employed in conjunction with it. Thus, it was found that it is because of investment in human capital that many economies could recover speedily from the post world war destruction. It therefore came to be realised that the difference between the growth rates of any two economies investing the same amount in non-human capital could be explained by the difference in their respective investments in human capital.

Edward Denison (1964) estimated the effect of advances in knowledge by subtracting the rate of growth attributable to all other inputs (besides that of labour and capital) from the total rate of growth. The exercise helped in isolating the effect of advancement in knowledge, identified as the contribution from the residual factor, explaining the growth of output not explained by the two major factors. After the World War II, it was further confirmed that the investment in physical capital yielded results only in countries which had qualified men to work upon that physical capital. Western European countries and Japan are examples of rapid increase in growth rate due to investment in human capital.

Whereas it is known that investment in education by an individual leads to their better future income streams, this approach is limited in scope since it focuses only on the productivity at work or in labour market and not on expanding the substantive freedoms of individuals. The human capital approach is thus integrated into the concept of human capability approach by including additionally an element of 'freedom of choice' as discussed below.

4.4.1 Education and the Capability Approach

The human capital theory essentially looks into augmenting production possibilities of individuals through skills, knowledge and effort. The focus is to link the productive efficiency of individuals, through investment in human capital formation, to their lifetime earnings. The human capability approach, propounded by Amartya Sen, focuses on the ***ability*** that individuals acquire by choosing to lead a life that they have a reason to value thereby enhancing the substantive choices available to them.

The difference in the two approaches lies in the scope of abilities that human beings are considered to acquire as a result of investment in education. The human capital focuses on the human qualities that also gets employed as capital in production, concomitant to the way physical capital is employed. This is, however, a narrow view as an educated person is able to not only enhance his productivity but can also enjoy the freedom to lead different kinds of lives which they have a reason to value. In other words, an

educated person is more than a factor of production because of his ability to make informed choices. Thus, investment in education, and through it owing to greater awareness in health, would enhance the 'capability' of individuals. Capability here refers to alternative combinations of various things, called 'functionings', that a person values and could do. It is a substantive freedom that an individual acquires to perform various functionings. Thus, education helps enhance human capability, going beyond one's labour productivity. Sen explains the role of education in enhancing the capability of individuals by specifying five important dimensions. The first is its 'intrinsic' importance which can affect effective freedom directly. Second is its 'instrumental' importance like seizing economic opportunities like getting a job and earning which will affect achievement of other functionings. Third is its 'social' role by enabling participation in public discussion of social needs, informed collective demands for improvement in public delivery of services and its better utilization, etc. Fourth is its instrumental 'process' role such as by schooling which can reduce child labour, improved social connectivity horizon like 'campus life', etc. The fifth dimension is the role of 'empowerment and distribution' like resisting exploitation, organizing politically to get a fairer deal both within groups as well as within family, etc.

As per the human capital approach, investment in education leads to increase in income through enhancement of factor productivity. However, it is not clear as to how the increased income translates into enhanced quality of life as increase in income need not always lead to an enhancement of capability or a substantive freedom for the individual. Expansion of substantive freedom can therefore be viewed as an *end* which the individuals value achieving. For instance, a person prone to illness, despite having purchased a basket of goods would have less chance of leading a normal life than a healthy person with a smaller basket of goods. Apart from this, there are: (a) environmental diversities like variations in climate which influences what a person can get out of a given level of income; (b) variations in social conditions which affect how a person converts personal income into enhanced quality of life; (c) unequal distribution of income within a family; and (d) differences in a relative perspective (i.e. a person who is relatively poor in a rich community might not be able to take part in the community life despite the fact that his income is above the income level of many people in the community). These factors are typically not taken into account in the human capital approach.

The freedoms are also just not the *end* but the *means* for further development. In order to enhance human capability various instrumental freedoms would be required. These are: (a) political freedom (i.e. freedom of political expression, opportunities to determine who would govern the State, possibility to scrutinize and criticize authorities); (b) economic freedom to utilise the resources like finance; (c) social freedom or opportunities like provision of educational institutions or health; (d) transparency freedom or guarantees (i.e. freedom to enjoy the right to disclosure); and (e) protective freedom or security (i.e. the safety nets provided to reduce the vulnerability and deprivation of people in society). Thus, since an educated person is better able to exercise these freedoms than an uneducated person, they can further expand their quality of life. The freedom which an individual enjoys fuels a person's overall growth and fosters the person's opportunities to have valuable outcomes. It is thus a *determinant* of an individual leading a successful life enhancing the person's ability to not only lead a meaningful life but also influence the society. Thus, the individual in the human capability approach is an *agent* who can act and bring about change, and not just a mere factor of production, who can enhance their future incomes by investing in education. This change can thus be a social change going beyond an economic change. For instance, female education may reduce gender inequality in intra-family distribution by helping to

reduce the fertility rates. At a social level, therefore, an educated female can help create awareness in her community about gender equality and the benefits of a smaller family. Thus, human capability serves to expand not just economic opportunities (like in the human capital approach) but can also lead to social development by making individuals the agents of change.

The above argument is not to say that income is inconsequential to enhance human capability. Income does help in providing the basic education or healthcare, which then enhances the substantive freedom of individuals. The various factors enumerated above explains the difference in the quality of life between individuals with same level of income. Thus, investment in education has a crucial role in not only enhancing the personal incomes of individuals but also enhance their capabilities, which the human capital theory does not capture.

The 'capability approach' (CA) proposes that social arrangements should be primarily evaluated according to the extent of freedom that the people enjoy to achieve what they value. It is a framework for evaluating and assessing social arrangements in terms of quality of life and well-being. Sen's CA is thus a moral framework that aims to enlarge informational space on the issues influencing the general wellbeing of people. In a broad sense, it indicates the importance of widening the peoples choices by expanding the human capabilities. In this framework of development, education is considered central to the notion of capability and has a much larger role to play for an individual's and thereby the societal development. Sen, in this approach, defines human capital as a means to produce quality human beings through education, learning and skill formation. In other words, while in the 'human capital' approach education is taken as the means of development, in the 'human capability approach' education is itself considered as development. Sen defines poverty as 'capability deprivation' rather than merely a lowness of income. Education is seen as a valuable functioning, something that is worth pursuing for its own sake, and is argued to eventually lead to development by enhancing the quality of life through the freedom of choice. The CA is, thus, built on the dual role of education viz. (i) an intrinsic value and (ii) an instrumental value i.e. education is relevant both as a means of economic growth and also to enrich the personal and social life of people. Sen's capability approach is criticised on the ground that the widening of education opportunities need not necessarily lead to an expansion of human capabilities. The theoretical and empirical works on the capability approach to well-being and development have several foundational problems that remain to be addressed.

Check Your Progress 2 [answer the questions in about 100 words in the space given]

1) Illustrate the manner in which classical economists emphasised the importance of education to economic development.

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2) Despite the view on the importance of education, what was the underlying reason due to which the debate on education continued to be regarded a 'consumption good'?

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3) How did Denison and Jorgenson succeed in establishing the significance of quality of labour to growth?

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4) What was the limitation of the methodology adopted by Denison and to overcome this what alternative approach was developed?

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5) Why did the theory of investment in only physical capital, believed to be adequate for long, came to be questioned?

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6) What were the contributions of Kenedrick and Solow to understand the contribution of factors besides labour and capital to output?

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7) In what way the finding by Schultz (1961) contributed to a more refined way of understanding the role of investment in education?

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8) State the four factors, not taken into account by the human capital approach, which goes to determine whether the individuals succeed in translating their income to enhanced quality of life.

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9) In enhancing the human capabilities, which other instrumental freedoms are identified as required for further development of individuals?

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10) State the main proposition of 'capability approach' proposed by Sen. On what ground is this approach criticised?

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4.5 SOCIAL DEMAND FOR EDUCATION

The benefits of education refer to the returns a person or society gets from education. In practice, it is mainly measured through the earnings or the earning potential of an individual. Broadly, the benefits of education are categorised as direct and indirect benefits. The direct benefits include the monetary earnings in terms of wages and salaries with the average life-time earnings expected to rise with every additional level of education acquired (e.g. a university graduate is expected to earn more than a secondary school leaver). The total lifetime earnings of an educated worker can be assessed through an age-earnings profile. There are also other kinds of financial benefits which an educated individual enjoys such as by taking up part-time jobs. As these returns are paid/received through money, it is also known as monetary benefit of education. Large part of the direct benefits are regarded as 'private benefits' as these mainly benefit the individuals although the society also gets to benefit from educated persons in some measure. The indirect benefits refer to the positive externalities which the recipients of education confer upon others in the society. Some of the externalities include improvement in health of the entire family, reduction in poverty, reduction in income inequality, better participation of women in community or family decision making, reduction in crime, etc. These may also include the pleasure derived by the learning process, the scholastic life led in life later, expected future consumption benefits, etc.

Weisbrod (1962) has categorised the indirect benefits of education into three broad groups namely, (i) residence-related benefits; (ii) employment-related benefits; and (iii) societal benefits in general. The residence related benefits are for mothers who can do some work while their children are at school. Employment-related benefits are the external effects of one educated worker in the work place on the productivity of other co-workers. There are some indirect benefits of education which accrue to the society in general like spreading information favourable to the maintenance of a competitive economic structure and democratic polity. Although such indirect benefits of education can be recognized, it is difficult to measure them. Further, the extent of indirect benefits

from different levels of education vary widely. For instance, it is expected that the parents with higher education can care their children better than the parents with primary level of education. There are also several external benefits of education (like neighbourhood benefits) that are not easily quantifiable. Due to the difficulty in measuring such indirect benefits of education, many researchers consider only the direct financial benefits. When these externalities are taken into account, the optimal amount of education that must be provided by the State is greater than what would be provided if only the private benefits are taken into account. This presents a case for public subsidisation of education.

4.5.1 Measurement of Costs of Education

In economics, in general, the concept of cost comes into play in the production of goods or services. The resources used to produce a good or service measured in monetary terms is known as the 'cost of the product'. If the measurement is per unit of service or good, it is known as 'unit cost'. Estimating the cost of education is useful for planning the resources required for the education sector. Further, estimation of the 'rate of returns' to education helps the government (and households) in deciding whether to invest in education or not. There is a difference between the cost of education and expenditure on education. While 'cost of education' refers to the value of all inputs that go into acquiring or imparting education, expenditure on education refers to the money spent on any item relating to the entire education process.

The costs associated with education are broadly categorised as 'institutional costs' and 'private costs'. The institutional costs (also known as social costs) are the costs involved in the establishment and running of the educational institutions i.e. the cost of the 'supply of education'. The cost of establishment of an educational institution is referred to as the 'capital cost' while the cost of operating it is known as the operational cost or the 'recurring costs'. For estimating the unit cost of education, both the capital cost and the recurring costs are taken into account. The recurring costs can be further classified into two broad heads viz. the direct expenditure and the indirect expenditure. The direct expenditure refers to the payment towards salaries of teaching and non-teaching staff (which are institution specific) while the indirect expenditure refers to the money spent on examining and regulatory bodies necessary for the running of the educational system. The costs incurred by the households and the students are considered as 'private cost' (or individual cost) of education. Private costs are of two types: 'direct costs' which include expenditure on items such as fees, purchasing of books and stationery, transport, uniforms, accommodation, etc. and the 'opportunity cost' refer to the alternative use of students time in school (since the time of the student cannot be taken as free). Alternatively, opportunity cost is defined as the earnings that would have been received had the student chosen not to go for education but to the 'world of work' (i.e. labour market). Likewise, the buildings or the land used for school/college have alternative uses and in that sense it is also a part of opportunity cost. For instance, decision to build a school or use a building as school would mean sacrificing its use for some other purpose. The sum of the costs of education incurred at the individual and the institutional domains, net of transfers such as fees, scholarships and stipends, is the 'social cost' of education.

It is argued that for planning purposes it is sufficient to know only the institutional cost of education. However, it is equally important to have a clear idea of the private cost of education as it would help the government in planning for subsidy or scholarship needs. Moreover, the problems of non-attendance and dropout in school education (in developing countries) is attributed to ignoring the importance of private costs (e.g.

opportunity cost). However, in practice, it is difficult to measure the costs of education in totality and relatively easy to estimate the private and direct costs as compared to estimating the social and indirect costs of education. The estimation of costs in the 'cost-benefit analysis' approach largely include the private costs ignoring the indirect and the social costs of education. More specifically, it is difficult to measure the opportunity cost of education which is the sum of costs foregone by the society and the individuals. But in some cases, they can be measured with some limitations by considering proxies. For instance, the opportunity cost of attending higher education can be measured by taking the average earning of a secondary graduate in the labour market.

4.5.2 Spence's Theory of Signalling

The returns to education, as per the Becker's approach to human capital, is viewed as an input in the production process. The leading alternative, stemming from the work by Spence (1970), is to view education purely as a signal i.e. a cue to consider education as a purely screening or signalling device. The rate of returns to education argues that the higher wage paid to the individuals in the labour market is due to the additional schooling received which augments the requisite skills and thereby the productivity. Contrary to this, the theory of signalling argues that the impact of education on increasing the productivity and income is not due to the skill augmentation, rather, it works as a screening device to distinguish between high and low productive workers. More specifically, the screening hypothesis claims that earning differences might be due to the superior ability of the more educated rather than their additional educational years. In this sense, attainment in the levels of education reflect certain characteristics (e.g. diligence, sincerity, and motivation) that are not required in the process of working or employment but are necessary for educational attainment. Thus, education (or a degree), or what is often referred to as 'credentials', acts as a screening device that helps the employers to differentiate between the more able workers from the less able workers. Such screening in the job market through education is useful because the employers (the buyers of labour services) cannot assess the true quality of the sellers of labour services (technically known as information asymmetry in the job market and is considered as a source of market failure). Though there is as yet a lack of empirical evidence on the screening theory in the literature on the economics of education, it is nevertheless viewed as a contribution in extension to the human capital theory.

Check Your Progress 3 [answer the questions in about 100 words in the space given]

1) State the three groups into which Weisbrod categorised the 'indirect benefits' of education giving some illustrations, in particular, for the 'societal benefits'.

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2) Distinguish between: (i) the 'cost of education' and the 'expenditure on education'; and (ii) 'capital cost' and the 'recurring cost' of education.

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3) How is 'opportunity cost' defined? How is it measured in education sector? Can certain type of 'capital cost' be considered as 'opportunity cost'? Why?

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4) What does the Spence's 'screening hypothesis' basically claim? What does it signify? In what way it is helpful?

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4.6 LET US SUM UP

The unit has addressed the issue of 'demand for educational services' from the standpoint of costs, expenditure and measurement dimensions. Beginning with a conceptual discussion on the classification of educational services as a public or private good, the account furnished in this respect proceeds to bring out the various alternative forms of 'goods' in terms of which also 'education' has since come to be viewed. The unit then discusses the contributions of different theorists which progressively led to the acceptance of education as an important component of enhancing the economic growth and thereby the human development of a country from a much more comprehensive sense than was earlier understood. The unit then defines various concepts like private/social cost, capital/recurring cost, institutional/opportunity cost and direct/indirect benefits helpful in measuring and thereby assisting the planners in providing for the required resources and policy framework for meeting the demand for educational services. An alternative theory of the use of education as a 'signalling' device, mainly to assist the employers in the labour market to distinguish between the quality of job seekers is finally outlined.

4.7 KEY WORDS

Benefits of Education : refers to the returns a person or society gets from acquiring education. In the economics of education literature, the benefits of education is measured through the earning potential or power of an individual. This is an incomplete measure as most of the externalities of education occurs outside the market. Broadly, the benefits of education are categorised as direct benefits and indirect benefits. Direct benefits include the monetary earnings in terms of wages and salaries while indirect benefits include the pleasure derived from the learning process, scholastic life, future consumption benefits, etc.

Cost Benefit Analysis (CBA)	:	Is a technique that determines the relative merits of alternative investment of scarce resources by assessing the costs and benefits associated with the projects/schemes under consideration.
Human Capital	:	Human capital refers to outcome of learning, skills, knowledge, etc. which remains embodied in an individual and manifests in the form of augmentation of productivity of individuals in their working and social life. The theory of human capital treats education as an investment in man and suggests that individuals and society gain substantial economic benefits from the people with education and skills.
Returns to Education	:	In the human capital theory the expenditure made on education is treated as investment and it is comparable with the investment done in any other physical capital. Its estimation procedures takes into account the costs and benefits of education to determine whether it is worthwhile to invest in education or not. The estimation of the returns to education has a range of limitations particularly in the methods and techniques used in its calculation.

4.8 SUGGESTED REFERENCES FOR FURTHER READING

Becker, Gary S. (1975), *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. New York: Columbia University Press.

Saumen Chattopadhyay (2012), 'Economics as a Public Good' (Chapter 6) in Education and Economics: Disciplinary Evolution and Policy Discourse, Oxford University Press. Details of references cited in Section 4.2 are available in this Chapter.

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Psacharopoulos, G. (1994), Returns to Investment in Education: A Global Update, *World Development*, 22 (9): 1325-43.

Woodhall, M. (2004), Cost-Benefit Analysis in Educational Planning (4th ed). Paris: UNESCO, IIEP.

4.9 ANSWERS/HINTS TO CYP EXERCISES

Check Your Progress 1

1) See 4.2 and answer.

2) See 4.2 and answer.

3) See 4.2 and answer.

4) See 4.2 and answer.

5) See 4.2 and answer.

6) See 4.3 and answer.

7) See 4.3 and answer.

8) See 4.3.1 and answer.

9) See 4.3.1 and answer.

10) See 4.3.2 and answer.

11) See 4.3.2 and answer.

Check Your Progress 2

1) See 4.4 and answer.

2) See 4.4 and answer.

3) See 4.4 and answer.

4) See 4.4 and answer.

5) See 4.4 and answer.

6) See 4.4 and answer.

7) See 4.4 and answer.

8) See 4.4.1 and answer.

9) See 4.4.1 and answer.

10) See 4.4.1 and answer.

Check Your Progress 3

1) See 4.5 and answer.

2) See 4.5.1 and answer.

3) See 4.5.1 and answer.

4) See 4.5.2 and answer.

UNIT 5 SUPPLY OF EDUCATIONAL SERVICES

Structure

5.0 OBJECTIVES

After reading this unit, you will be able to:

- describe the nature of educational services;
- distinguish between the role of institutions (State and the Market) in funding the educational services;
- state the alternative models in the provision of education under the Public Private Partnership mode;
- specify the budget equation for education provision by type of institution;
- highlight the imperativeness of complementary investments at the institutional and individual levels for acquiring education; and
- examine the tenability of education production function.

5.1 INTRODUCTION

The education services are provided by institutions distinguished for their public-funded, private-funded or a mix of the two i.e. public-private-partnership based ones. In the public-private partnership institutions, both the management and funding are shared between the State and the private players. It is important to note that the provision of educational services entails huge investment to begin with and then substantial recurring costs for its operation. The cost is shared solely by the State in case of public-funded institutions and partially in the case of state-aided private institutions. Besides this

operational cost, there is also a cost for the individuals like students/parents, which is an important source of resource for the private institutions. Apart from this, the cost of education is also sometimes met by the funds of donors or other internal receipts of institutions. Studying the funding pattern of expenditure would help in relating the nature of institutions to the type of educational services they provide.

At different levels of education, the mode of funding primarily varies due to the status accorded by the government. For instance, the school level education is accorded the status of a merit good and hence its provision is largely done by the State (although the private sector also participates at this level). Higher education is considered a quasi-public good (or a mixed good) as the benefits of acquiring education at this level is not restricted to the individuals but extends to others and the society in the form of externalities. Due to this benefit of externality, maintaining an equality of opportunity among the different sections of the society requires the State also to play a major role in the higher education sector. The co-existence of private and public funding of education dates back to the ancient Greece period where there was a group called Sophists, who stressed that education (particularly higher education) be taught for fees because the recipients could make a better living out of it. The focus was on providing practical subjects which would provide employment to students justifying the charging of higher fees from them. On the other side were philosophers like Plato and Aristotle, who disagreed with the 'fees' based approach to higher education as they considered the purpose of education was to promote 'virtue'. Thus, virtue is tantamount to a non-market approach and sophism to the market approach (Stabile, 2007). This debate on who 'should' provide education and bear its costs can be seen in the present times as well.

5.2 NATURE OF EDUCATIONAL SERVICES

The supply of educational services needs to be discussed at its different stages of a life cycle viz. (i) pre-school; (ii) school; and (iii) post-school levels. While at the pre-school and school levels the cognitive, non-cognitive and physical skills are produced, at the post-school stage, the skills generated are specific to the requirement of labour market. Investment in education being expensive in terms of the foregone opportunities particularly for the poorer families, the supply of educational services at each of the above three stages should be a positive function of the returns fetched i.e. higher is the promise of return in the market, higher should be the supply. However, the derivation of supply function in educational service (at any of its three stages) has certain difficulties due to its special features. These are:

i) the learning curve being linked to the previous stage of education, supply at each stage depends (in quantitative terms) on the supply at the previous stage and the supply at the future stages on the 'expected returns' in terms of higher incomes;

ii) the decision taken in the previous stage cannot be reversed i.e. there is a path-dependency in the choices at the successive stages of education linked to that in the previous stage (in other words, the history of acquired skill restricts the feasibility set in the successive stage);

iii) the production at each stage requires complementary investments (both from the individuals and society in terms of time, money, etc.);

iv) the objective of the two agents (i.e. household and institutions) at each stage differs i.e. while the household might accord priority to short-term micro objectives, priority of the institutions would be a long term macro objective; and

v) at the societal level, the need would be to combine the heterogeneity of choices for an optimal outcome.

Given the above, for understanding the issues behind the provision of educational services, it is important to study the significance of education to the individuals and the society. An educated individual gets the benefit from investing in education in the form of future income streams. This is called as the private benefits. In addition, the benefits of his education spills-over to the society which is called as 'positive externality'. Education therefore has characteristics of both a merit good and a public good depending on the level at which we consider it. At the school level, for instance, the education can be identified as purely a merit good, the provision of which needs to be undertaken by the State, without taking into consideration the individual choice and without leaving out anyone from the educational system. The individual could be ignorant of the benefits of education at this stage but he needs to be compulsorily enrolled to minimise the otherwise negative externalities to the society. At the post-school level, the prospects of earning higher income in the future increases for an individual, in addition to the positive externalities that they confer to the society (e.g. improvement in health, participation in community decision making, reduction of poverty, reduction in corruption). This, therefore, renders the post-school education to assume the characteristics of a mixed good. In view of this, higher education has come to be classified sometimes as a quasi-public good.

In the above context, there has been a debate on how the education should be funded. It is suggested (e.g. World Bank, 1994) that the State funds should be shifted away from higher education to school level education because it is the elite who mainly gain access to higher education. It is argued that the individuals who stand to benefit from greater future income stream should pay for their education at the post-school level. In light of this, it is important to focus on the 'funding' aspects of educational supply.

5.3 FUNDING OF EDUCATION: ROLE OF STATE VERSUS MARKET

As discussed above, education has characteristics of both a public good and a merit good depending on to which level of education we are referring. However, the World Bank (1994) puts forth an argument to consider higher education as a private good and advocates that it should be funded by the individuals involved with the market facilitating to assist the funding through the banks. This argument needs to be assessed carefully keeping in view the nature of education outlined above.

Role of market: The role of market as a source of funding took off post-1990s, when the World Bank and IMF suggested structural adjustment programme requiring a cut in the public expenditure. It was argued that public expenditure is wasteful and leads to inefficiency. The supporters of market considered the subsidies provided by the government as regressive in nature as it is mainly the elite who get access to higher education and therefore are the major beneficiaries of subsidies at higher education level. The funds are thus transferred from poor to the rich as there is that much less to spend on poor. To rectify this, the public funding should shift from higher education to school level education for the sake of efficient utilisation of financial resources. Another argument put forth by the market supporters is that the State funding of education would make educational institutions dependent on the State and, therefore, to that extent curtails their institutional autonomy. To overcome this, generation of private funding was suggested to be promoted. It was also argued that the cost recovery measures would improve the quality of education by making the students more diligent

about their studies. It was further posited that the private returns being higher, exceeding social rates of returns for individuals, it should make the beneficiaries willing to pay for education.

Role of State: The market proponents argue that the social rate of return to investment in education is less than the private rate of return due to very high social cost in the form of subsidies. This is argued to be particularly true for higher education whereas for school education there is a greater degree of consensus that it should be regarded as a merit good. However, when social benefits or positive externalities are added to the private benefits, the *resulting social rate of return* far exceeds the private rate of return. This makes the role of state crucial in funding education. Second, consumers are often ignorant of the benefits that they would receive by investing in education and the positive spill-over of their education on others like improving family health, productivity, reduction in poverty rates, awareness about political rights, etc. The government is considered wiser than the individuals in making such decisions and, therefore, State funding in the provision of education is required for ensuring equality of opportunity, both socially as well as economically. Since not every household/individual has the resources required to invest in education, in the absence of state subsidies, only those who could afford to pay for education would enrol in schools and colleges. Those who are meritorious but lack resources would be left out.

Thus, while it is argued by the market proponents that the access could be ensured by providing student loans, the fact that capital market suffers from imperfection needs to be tackled. The human capital, which is embodied in the individuals, cannot be offered as liquid collateral. Individuals would also not borrow because of long gestation period involved. Also, there is an uncertainty of future income opportunities. These factors obstruct a person from borrowing for investing in education. Thus, the presence of imperfect capital market becomes a fourth reason for the role of State to invest in education. The different sources of funds for educational institutions (private/public sources or both) and their allocation to different heads of expenditure can be better understood using the budget equation, discussed in the next section.

5.4 BUDGET EQUATION FOR EDUCATIONAL INSTITUTIONS

Educational institutions incur expenditure on provision of infrastructure like buildings, books, maintenance of water and electricity, teachers' salary, etc. The expenditure is incurred from the revenue they receive, either from the government or private sources or both. Even when the revenue exceeds cost, ideally the surplus is not redistributed as profits but reinvested in infrastructure. Thus, for a non-profit educational institution, the budget equation (Winston, 1999) is represented as:

$$p + dr + g = c + v + d$$

Where p represents commercial revenue, dr represents the donations received, g represents the grants received from the government, c is the cost of education, v is the retained profits and d is the dividend generated. The left hand side of the equation thus represents the revenue (or earning) of the institution and the right hand side the cost (i.e. expenditures and dividend). The dynamics of the equation would vary according to the type of institutions as discussed below.

For a government aided institution, there would be no dividend to be redistributed and also no retained profits. Therefore, d = v = 0. Also, *dr* would be mostly zero for a

government institution. The budget equation for a government institution therefore reduces to:

$$g = c - p$$

In the above equation, g is the extent of grants or explicit subsidies. If p is partially recovered from students in the form of fees, then g would represent the subsidies given by the state to cover the remaining cost (c–p). If c represents the amount spent on scholarship, then the difference between c and p would represent the net tuition fees covered by the State grants.

For a privately funded institution, the government grants would be zero i.e. $g = 0$. The budget equation reduces to:

$$dr = (c - p) + (v + d)$$

Higher the dr, and more is the fees (c) charged from the students, higher would be the capacity of the private institutions to spend more on improving the quality of education. For an university/institution serious about its quality of education, a higher dr may mean recruiting better qualified faculty by paying higher salaries or offer scholarship to students or charge less fees (i.e. lower p). If dr is less, higher fees would have to be charged from the students to meet the expenses. A reduction in the cost may also adversely affect the quality of education because there exist a positive relationship between costs and quality in the education sector.

Apart from the publicly funded and privately funded educational institutions, there exist institutions operating under the public-private partnership (PPP) mode. Presence of private players in funding, operating, designing etc. is advocated on the grounds of efficiency and the lack of financial resources with the government to expand the educational services to meet the demand by the government alone. The implications of PPP on the functioning of institutions has been explained by extending the Winston's equation as follows:

$$f + dr + g = c + v$$

As before, the left side of the above equation represents the various sources of revenue with f being student fees, dr being donation and g the government grants. The right side of the equation gives the cost of running the institute (c), and the surplus (v) for the private sector's participant involved in the PPP arrangement. Under the PPP mode, v is generally present as the private sector seeks to earn a return over the capital they invest. In the above equation, g would have two components: grants for maintenance and grants for capital expenditure. Since, private players usually make the investment on capital expenditure, g generally involves only the maintenance support. If we assume away dr for the time being, the above budget equation for PPP reduces to:

$$g = c - f + v$$

The following three cases arise in the PPP context:

Case 1: Participation of private player may not lead to efficiency or reduction in the cost. If the tuition fees, f, is regulated, then the government support should be higher in order to balance the budget equation duly.

Case 2: If f is allowed to increase, then the government grant may be reduced. But a reduction in g is possible only if the fee increase is substantial to yield a rise in v. However, any reduction in c (whether accompanied by a rise in f or not) may cause a fall in quality because quality and cost in education are positively

correlated. If there is a rise in f and the government support is reduced, it could lead to exclusion of meritorious from the economically disadvantaged segments.

Case 3: Suppose government provides only land but no grants and the financial affairs managed by the private sector is allowed to generate a reasonable surplus. In such a situation, without government grants, the surplus generated is given by:

$$v = f - c$$

Let the new reduced cost of running the educational institution be denoted by $\hat{c}$

The budget equation becomes:

$$\tilde{v} = f - (\hat{c} + c_b)$$

where $\tilde{v}$ is the new level of profit comprising of permissible level of profit v plus c_b standing for any other profit derived (assumed to be generated owing to cost balancing and surplus generating motives of private player). Thus, applying $v = f - c$, the above equation can be re-written as:

$$\tilde{v} = v - c_b$$

Check Your Progress (CYP 1) (answer the question in about 100 words within the space given)

1) State in brief the specific features of the education sector which pose difficulties to the planners from defining an educational supply function.

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2) Why is 'higher education' called as a quasi-public good? How is the school level education considered in this regard: why?

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3) What were the main arguments advanced by the market protagonists in holding that educational expenditures are inefficiently consumed and therefore must be suitably targeted?

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4) What are the counter arguments made by the proponents of State in suggesting that the State should play a leading role in financing education?

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5) Do you agree that there is a relationship between 'costs' and 'quality' in providing education? Justify your answer by using budget equations for the two main type of institutions engaged in providing education.

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5.5 THE DOMAIN DISTINCTION IN EDUCATION PROVISION

Individual investment in human capital would be meaningless if it is not supported by a simultaneous investment by the institutions or the State, and vice-versa. These two domains thus are complementary to each other. Indeed, if the decision to invest in education by individuals is not accompanied by a decision to invest by the State, there would be overcrowded classrooms, or if decision to invest by the State is not commensurate with individual investments, there would be empty classrooms. The domain of individuals and institutions differ with respect to time and objective. In section 5.3 above, while making a distinction between the returns to private and state's investment decisions in education, we assumed that the outcome of learning is a form of human capital and therefore the expenditure incurred on education is a form of investment. The approach to investment decisions essentially lengthens the years of education. This approach is criticized on the ground that, in reality, the investment decisions are much more intricate in nature both in the domains of the individuals as well as the state. Once these intricacies are considered, the rate of return approach turns out to be inadequate as a guiding principle for determining the educational supply.

The decision of making investment in education, in addition to lengthening the duration of education, increases the opportunity cost of using the labour in alternative employment. It also makes the money, which could have been invested elsewhere, to be invested in obtaining higher education. However, besides the average net rate of return at lower levels of education being relatively smaller, in most cases the true or higher ability of an individual to benefit from seeking higher educational levels is not easily observable. The return to higher quality of education, which is supposed to promote higher earning ability, is thus equally difficult to observe. There is a further difference between the households and the institutions in terms of their size of activity. Typically, the quantum of investment made by the households is too small compared to the quantum of investments required for setting up an institution. Therefore, the institution's investment could influence the market rate of return by impinging on the factors of both demand and supply. For instance, if too many doctors are produced, the return to medical education can fall whereas the households can only take the net expected rate of return to education

prevailing in the market into account. In this sense, Majumdar (1983) points out that the distinction in the behaviour of the households and institutions should be taken into account as they both operate from two different domains.

Due to the distinction of difference in domains, a problem of collective choice arise. These are particularly in situations where the preferences of individuals and institutions/ state over alternative educational policies/programmes differ. Majumdar illustrates this point by citing the example of Brazilian Intensive Program for the Preparation of Industrial Labour (BIPPIL). In the 1960s, Brazil estimated its annual need for qualified labour, by taking into account the growth and replacement factors, to be of the order of 5000 technicians and 60000 skilled workers. However, since the institutions could only supply about one-fifth of the estimated needs, to meet the urgent needs for skilled workers and technicians the Brazilian government had two alternatives: (i) train unskilled workers for the highly skilled occupations through a long term programme; or (ii) upgrade and retain its semi-skilled and skilled workers through a short term programme. The first alternative of skilled labour supply was clearly more expensive and hence, from the long term macro perspective the shortage was considered temporary. With this idea, the decision to follow the second alternative was implemented by the government. However, such a policy could be successful only if the individuals in the target group concerned also made the necessary complementary investments in their own domain for securing the required additional training. Since the older workers did not have the incentive to invest in their individual domain, by way of required initiative to even learn from the training offered at states' expense (a situation of diminishing returns with age being in application), the policy did not succeed to the required extent. Therefore, a policy which might appear economically optimal, could falter in its implementation because of the expected complementary domain decisions not coming forth.

5.6 EDUCATION PRODUCTION FUNCTION

In a firm, the production process of a product is described by a production function where inputs are combined *efficiently* to produce certain units of output. *Efficiency* implies that given the cost of inputs, either for the combination of inputs used maximum possible amount of output is produced or for the output produced, minimum cost/ quantity of inputs is incurred. Along the supply chain of a product, at different stages, different amount of value addition is made before the final product is produced and sold to the consumers. If an analogy is drawn between the education production process and the production process of a product, it would be an example of a supply chain where an input (a five year old child), enters the educational process and moves on from pre-school to school to post-school stage with additional inputs like teachers, books and equipments employed, and with value addition in terms of enhanced human capital formation taking place at each stage, the final product emerges out with a graduation or a post graduation or a research degree. Does the concept of production function, as in the theory of firms, apply to the educational process too? If so, can we apply the concepts of productivity and cost efficiency in a similar way to an educational process? For having an answer to these questions, we first need to understand the nature of inputs, whether there is a well-defined output like in the case of firms in the education production process, and most importantly, on the valuation of output from the education sector.

5.6.1 Output and its Valuation

In education, the output would be the end product like 'degree' or 'number of graduates' or 'research output', etc. The students or 'graduates' are not only the output of the

process but also the inputs. It is thus not clear whether they could be treated exclusively as output or input because they are both inputs as well as outputs. Even in the matter of knowing the aggregate output of the educational institution, the outputs cannot be combined and expressed in equivalent units as they all are not homogeneous in their nature. Secondly, the educational institution aims at maximising quality, which is also difficult to measure. In other words, the degree acquired cannot be taken as a signal for a common standard of quality i.e. unlike in a goods firm, where the rejection is often considered as a sign of credibility/quality, in the case educational outputs rejection would not be an indicator of quality. Even the number of graduates should not be taken as output because these are not as easily measurable (or quantifiable) for uniform quality like in the case of industrial production. Thus, the output and the societal purpose of the education need to be factored-in in order to account for the valuation of output in education.

5.6.2 Unit Cost of Production

The unit cost in the education sector refer to cost of education per student. The unit cost in an industrial production is generally taken as an efficiency indicator where the attainment of technical efficiency entails minimizing the unit cost for a given level of output. But in the case of an educational institution, first of all, as discussed above, the number of students is not a reasonable measure of output. Secondly, taking unit cost as a signal for efficiency would require an additional assumption of constant quality of education. However, the costs of education and quality are positively related to each other. In other words, whereas the higher unit cost associated with higher output level (i.e. in quantitative dimension) creating an upward rising average cost curve for a product of a given quality is an essential feature of production firms, in education higher unit cost per student normally implies higher quality of output. Minimizing the cost would, therefore, have an adverse effect on the quality of education. Aiming to achieve efficiency as is done in case of firms would therefore be detrimental to the educational institutions' goal of prestige maximisation and societal benefit at large. Also, the positive influence of intra-group peer effect among a group of students is unique to the education production process. This is to say that, all other things remaining the same, the intra-group learning process is facilitated in the improved performance of the students. Since this requires keeping the number of students limited in a batch, the per unit cost of student tends to shoot up which cannot be regarded as reflection of inefficiency.

5.6.3 Optimum Input Mix

In the conventional theory of firms, given a production technology, the input mix used to produce one unit of output is determined by the relative prices of inputs in the market. This permits substitution of inputs of comparable quality in greater proportion. In the presence of constant returns to scale, the same input mix is maintained at all scales of operation. In the education process, however, most of the inputs used cannot be used with a similar substitution effect. This means institutions employing better teachers and admitting meritorious students, produce higher quality output. In other words, although better inputs would produce better output in case of production firms, in the education sector the non-permitting of substitution of inputs as mechanically as in production makes it characteristically different in itself.

5.6.4 Multi Product Firm

As said before, the students are not only outputs but are also inputs in the education sector. The educational process adds value to them between their entry and exit. The extent of value addition depends upon their own investment decisions owing to the

existence of complementarity in decision making domains. The identity of the decision maker and her objective function is therefore not clearly distinguishable unlike in the case of production firms. In view of these distinctive features of input-output and decision making, an educational institution (or an university) is considered a multi-product firm. In particular, it is further distinguished for its production of three different types of output to the society viz. (i) *educational output* in terms of students' cognitive and social skills, (ii) *informational output* in terms of a student's ability or skills acquired to prospective employer, and (iii) *research output* in terms of the stock of knowledge. The three different types of output are not mutually exclusive as, for instance, with the production of quality educational output, there would be an automatic improvement in informational output. Because of this interdependence, it is difficult to construct a composite indicator of a university's output by appropriately assigning weights to the three different types of outputs that it produces. Further, since each lower degree provides the input of students for the succeeding stage of the degree, each degree creates a positive externality for the other degree. Thus, while on the one hand, research helps to improve the quality of teaching at both undergraduate and post graduate levels, on the other, good quality students at the undergraduate and post graduate level helps in good research. Moreover, while a government university would aim at maximising the social welfare, a private university maximises its prestige, performance and revenue (Marginson, 2009). There is thus a fundamental difference in the objectives of a government university and a privately managed university.

There is a further inter-dependence between the quality of students and teachers on the one hand and the standard of selection procedure adopted for selecting them (i.e. both the students and the teachers) by an educational institution on the other. While the quality of teaching and research depends upon the quality of students and faculty, the standard of selection determines the performance of the students and teachers by the institution (Winston, 1999). Students being the important input for educational institutions, the institutions attracting better endowment also attracts meritorious students through scholarships, subsidised education, etc. Further, better salaries attract better quality faculty. Such institutions with better students and faculty attain prestige. For such top quality institutions there would be a high demand linked to the quality of existing students. To ensure future quality, the institutions would select only the meritorious students, creating a situation of excess demand. Thus, student quality gets concentrated in institutions which have more donative wealth. Similar is true for the faculty. The students or faculty which are not selected for relatively top ranked institutions would veer towards lower ranked institutions, leading to a S-competition or selection bias in education. The concept of market efficiency, where demand equates supply at a given price, ceases to apply in education. In other words, the concept of production function and education becomes untenable.

Check Your Progress 2 [answer the questions in about 100 words in the space given]

1) State two reasons which makes the decision of making investment in education domain dependent.

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2) Can you say that output is well defined in the education sector? Why or why not?

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3) State as to why 'unit cost of production' cannot be taken to indicate the efficiency of the output in the education sector. Explain the conflict between efficiency in education sector and quality education.

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4) How does using different input-mix alter the quality of output in education? Illustrate with an example.

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5) Why is an educational institution or university called a multi-product firm?

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6) State two reasons why the education production function is not a tenable concept.

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5.7 LET US SUM UP

Education as a service is different from other products and services because of some of its specific characteristics. There is a two-way interdependency with each level of education serving as a positive externality to the higher levels and vice-versa. The output is derived through decisions made by individuals and institutions at complementary domains with different objective functions. Determination of both value of output and cost of inputs is difficult in the case of educational production process. Educational services are also supplied by a variety of institutions with different objective functions

and different financing patterns. Financing can potentially influence the quality of educational outputs delivered.

5.8 KEY WORDS

Domain Distinction : Refers to the two complementary domains of households and educational institutions whose objective for investing in education are different (the former having an expectation of future streams of income and the latter a societal need or image in terms of prestige or profit).

Multi-product Firm : Refers to the complementary character of educational institution or university producing different levels of products (i.e. graduate, post-graduate or research outputs). The outputs produced are also distinguished for their educational, information and research outputs.

5.9 SUGGESTED REFEENCES FOR FURTHER READING

1) Becker, G. S. (1962): Investment in Human Capital: A Theoretical Analysis, *Journal of Political Economy* 70/5 (2), 9 – 49.

2) Becker, G. S. (1964): *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*, New York.

3) Becker, G. S. (1975): *Human Capital: A theoretical and Empirical Analysis with Special Reference to Education*, Second Edition, New York.

4) Chattopadhyay, S. (2007): *Exploring Alternative Sources of Financing Higher Education*, Economic and Political Weekly, 42 (42), pp. 4251-4259.

5) Marginson, S. (2009): 'University Rankings and the Knowledge Economy' in M. A. Peters, S. Marginson and P. Murphy (eds) *Creativity and the Global Knowledge Economy*, New York: Peter Lang, 185 – 216.

6) Tilak, J.B.G. (2004): Public Subsidies in Education in India, *Economic and Political Weekly*, January, pp. 343-359.

5.10 ANSWER/HINTS TO CYP EXERCISES

Check Your Progress 1

1) See 5.1 and 5.2 and answer.

2) See 5.2 and answer.

3) See 5.3 and answer.

4) See 5.3 and answer.

5) See 5.4 and answer.

Check Your Progress 2

1) See 5.5 and answer (observable difficulty and size of activity).
2) See 5.6 & 5.6.1 and answer.
3) See 5.6.2 and answer.
4) See 5.6.3 and answer.
5) See 5.6.4 and answer.
6) See 5.6.4 and answer.

UNIT 6 DETERMINANTS OF EDUCATIONAL SERVICES

Structure

6.0 OBJECTIVES

After going through this unit, you will be able to:

- discuss the determinants of demand for educational services;
- critique the rate of return approach to assessing the demand for educational services;
- bring out the difference between the Mincerain wage equation and its multi-factor extension model for determining the demand for educational services;
- explain the empirical procedure for assessing the economic contribution of education;
- describe the significance of human capital formation to economic growth;
- indicate the importance of 'social returns from education' to the economy;
- discuss the mechanisms for funding of educational services; and
- contrast the alternative modes of funding education with illustrations drawn from international experiences/practices.

6.1 INTRODUCTION

The primary rationale behind investing in education by an individual is to enhance the possibility of future employment prospects and therefore higher income. This is particularly true for investing in higher education as the primary and secondary levels of education, with their relatively lower prospects of earnings, act only as the stepping stone for moving on to higher education. However, the economic consequences of investment are concerned with not only individuals but also the society and the economy. At the macro level, therefore, the economies seek to invest in education as better educated individuals can take part in knowledge generation through research and development, contributing to boosting the economic growth as well as knowledge dissemination. A case in point is Japan which, because of its stock of qualified people, could better use the physical capital available to result in a rapid recovery of its economy in its post World War II years. Apart from this, an educated person can appreciate the significance of institutions like democracy and therefore can contribute to fostering citizenship essential for social order.

When an individual spends on education, their human competencies are enhanced. This adds to their productivity at work and thereby their future income streams. This is called as 'human capital formation' because the capital in the form of learning is embodied in human beings contributing to the income stream of the individual (and in the cumulative sense to the economy through enhanced cognitive development). Thus, the future income streams act as a major factor for determining the demand for education by individuals. The human capital formed is, therefore, the labour that is skilled in production, labour that can operate sophisticated machinery, labour that can create new ideas and new methods in economic activity. The human capital approach thus focuses not only at the individual level, but also links the development in human resource, as a result of investment in education, with national income. The human capital approach thus goes beyond the investment in only physical capital and provides an explanation for the reason of economies either converging or diverging in terms of their economic growth. While this shows the demand side for investing in education, there has to be a concomitant provision of educational services. In this, funding plays a major role. This brings into play the institutional aspects (vis-a-vis the public and the private institutions) seeking to meet the demand for educational services in the economy. The concept of social rates of return and the benefits of advancing human capabilities, as opposed to merely viewing investment in education for human capital formation, would take the centerstage in determining the supply of educational services. Against this backdrop, the present unit first deals with the determinants of demand for educational investment. It then deals with the supply side determinants, first in terms of the dual type of institutions (i.e. public, private) in providing education, and in its light, the alternative ways of funding education.

6.2 DETERMINANTS OF DEMAND FOR EDUCATIONAL SERVICES

In unit 4 we have already studied the concepts of 'rate of returns' approach to education and the Sen's capability approach. In this section, we revisit both these concepts, along with the concepts of Mincerian wage equation and its multi-factor extension version (i.e. by considering factors other than education and work experience) that goes to determine the demand for educational services. The limitations of rate of return approach is also outlined in this section.

6.2.1 Rate of Return: Stream of Income

An investor in a capital market measures the rate of return relative to the cost of investment and then decide on whether to invest or not. Likewise, in the educational market, parents and students need to take the decision on whether to invest in education and in which discipline or program of education to invest. This decision takes into account the expected returns of future income at the private or individual level and the positive externalities to the economy at the societal level.

The concept of cost-benefit analysis in education has been widely discussed since the mid-20th century. For instance, the economic consequences of investing in education by an individual was recognized by Adam Smith when he stated that 'a man educated at the expense of much labour and time' to acquire the ability to perform his tasks with 'dexterity and skill' must be expected to be paid 'over and above the usual wages of common labour'. The 'over and above the usual wages' is a compensation or return to the investment in education which enhances their productive capacities. Thus, called as the 'return to investment in education', it is a major determinant for investing in education by an individual.

Many economists (e.g. Walsh, 1935; Friedman and Kuznets, 1946; Becker, 1960; Schultz, 1961) have attempted to empirically verify the returns to education in terms of future income stream. This has been done by taking into account the delays in earning and the expected lifetime paths. Most of them have used the cost-benefit analysis of discounted values of future earnings. The cost incurred by an individual comprises of direct costs (like education fees and incidental expenses the individual incurs during schooling) and indirect costs by way of foregone earnings while studying. If the education is provided mostly free by the state, the only major cost is the foregone earnings of the individuals. In this case, the private rate of return to investing in a given level of education is estimated by finding the internal rate of return 'r' (defined as the 'rate of discount' which equates the stream of future value of benefits to the sum of present costs). For instance, if a university education at Masters Level (m) is acquired over 2 years after acquiring an undergraduate degree (u), and it is assumed that an individual works for 30 years after his acquiring the master's degree, then the 'rate of discount' is estimated after the completion of masters as:

$$\sum_{t=3}^{33}\{(W_m - W_u)\frac{1}{(1+r)^t}\}=\sum_{t=1}^{2}(W_u + C_m)(1+r)^t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where (W_m-W_u) is the earnings differential between a masters' graduate and a undergraduate. C_m refers to the direct costs incurred while acquiring the masters' degree and W_u is the student's foregone earnings or indirect costs (Figure 6.1). During the period a student spends 2 years in acquiring a post-graduate degree, he also incurs some indirect costs. The indirect cost refers to the foregone earnings which increases at an increasing rate with every incremental level of education due to increase in experience gained with time. The higher the 'r' the more incentives the individuals have in investing in education. This approach to rate of returns is critiqued on certain fronts as follows.

a) ***Alternatives in Education Investment:*** The rate of return approach assumes that with the increment in the level of education, the differential in the wage earned also increases. In other words, it assumes that every incremental level of schooling is an alternative investment. But the increments of schooling at different levels of education cannot be treated as alternatives as every future opportunity is contingent upon the previous investment. Also, rather than different levels of schooling, an

individual has other alternatives like devoting more resources to better education or training at another level (i.e. allied or specialised area) rather than investing funds for the same type of education beyond a level.

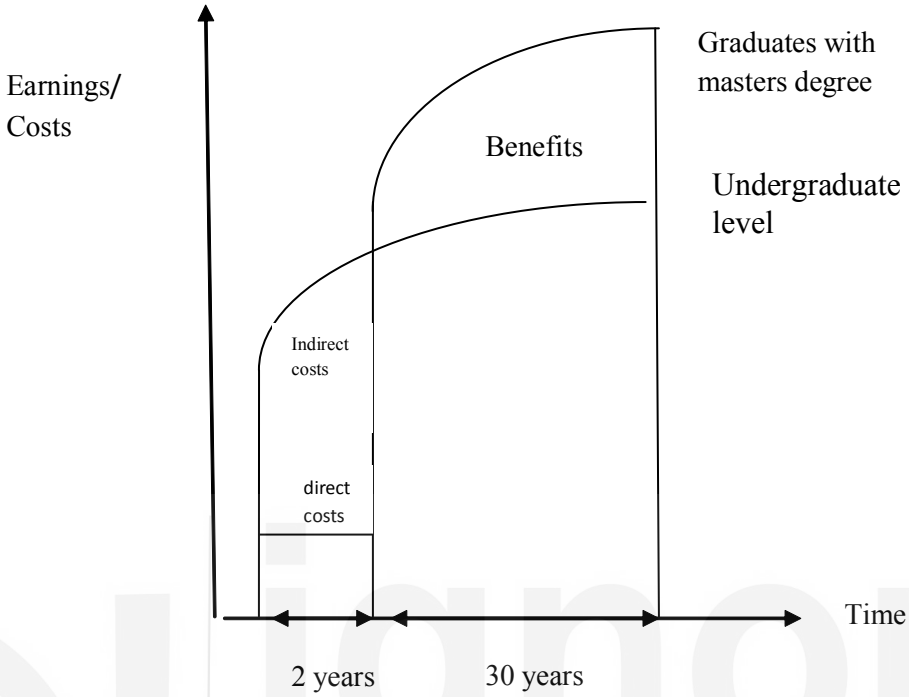

Figure 6.1: Age-earning Profiles

Source: Psacharopolous and Patrinos (2004)

b) Education is Different from Production: Education cannot be characterized as a physical unit produced by a firm for several reasons. One, the output produced is not well defined like in the case of a production firm as it is not possible to combine the outputs like teaching and research in equivalent quantifiable units. Two, whereas in the case of a firm, minimising unit costs is a sign of efficiency, in case of education process there exist a positive relationship between costs and quality. This is in the sense that in order to improve the quality of education, investment in teaching infrastructure has to be increased. Three, students are not only the investment decision makers but they are also inputs in the process. Due to these reasons, it is difficult to delineate the production function of an education process.

c) Education is a Signalling Device: The employer is faced with the lack of information on the productivity of the employee. There is, however, an incentive for the students to produce the signals in the form of degrees maximising the probability of being selected. Thus, demand for education is also guided by its 'signalling incentive'.

d) Heterogeneity of Investment Decision: There is a distinction between individual investment and institutional investment with respect to their domains of objectives and time horizon. The rate of return approach fails to take note of these two different domains of investment. For instance, the time span over which an individual considers investing in education is short as compared to institutional investment which spans over generations or long period of time. The latter therefore considers the impact it would have on rate of returns of not only the present generation of students but also several generations to come. There are other two

methods commonly used in calculating the returns to education. These are: (i) the cost-benefit analysis (CBA) approach; and (ii) the internal rate of return (IRR) approach.

6.2.2 Cost-Benefit Analysis of Education

Cost-benefit analysis (CBA) is a technique that determines the relative merits of alternative investment of scarce resources. For instance, suppose that there are alternative projects or programmes (say A, B, C,....) to invest the limited resource and we have to decide in which of these programmes it would be worthwhile to invest? The CBA seeks to answer this question by assessing the costs and benefits associated with each of these programmes. It is worthwhile to undertake the programmes in which the benefits are more than the costs. The concept of CBA was first used as an administrative tool in the field of water resource development in USA at the beginning of the eighteenth century. With the growing importance of education in economics and human development, CBA has also been applied for evaluating educational projects. They are particularly useful in estimating the net contributions of educational programmes in order that the educational planners might allocate more public resources to education (discriminating between different types of educational programmes) so as to maximise society's goal.

In the CBA, after estimating the benefits (B) and the costs (C) of education, the difference between the two, B – C, is considered to decide whether there will be investment in a particular project. If the cost exceeds the benefit, then the decision to invest will not be made. However, such a consideration will not apply where social benefit is preferred over the cost (e.g. elementary education to all). The other indicator used to take decision on the basis of CBA is the benefit-cost ratio (BCR) which is the ratio of the 'benefits of a project relative to its costs', both expressed in monetary terms. Using the benefit cost ratio, a decision on whether or not the benefits of a given proposal outweigh the actual costs that go into the creation of the project can be made. It helps the educational planners to make investment decisions on different alternatives available to them. The other important technique used to evaluate the educational projects is the cost-effectiveness analysis (CEA). Both the CBA and the CEA involve systematic comparisons between cost and outcomes. However, the difference between these two techniques is that while in CBA the outputs are measured in monetary terms (such as labour market rewards from education), in CEA they are measured in terms of physical/cognizable outputs like level of achievement, quality of teaching, etc. The CEA is usually used to address only those questions that relate to the internal efficiency of resources invested, while the CBA examines the external efficiency of investments made.

In the CBA, the present value of future benefits is compared with the present value of costs of education. For obtaining the present values, the future streams of benefits and cost are discounted at a certain rate of interest 'r'. The CBR is then obtained as:

$$\sum_{t=n+1}^{m}\left(\frac{B_t}{(1+r)^t}\right)\Big/\sum_{t=1}^{n}\left(\frac{C_t}{(1+r)^t}\right)$$

where C_t is the cost of acquiring a given level of education; B_t is the excess earnings or productivity as a result of a given level of education as compared to a lower level of education; the time invested in acquiring education is 'n' years, and after acquiring education the individual works for 'm' number of years, and 'r' is the rate of discount. An important determinant of the demand for education is its expected benefits. According to the human capital investment theory, an individual would prefer to attend school only

if the present value of the expected benefits from schooling exceeds that of the expected costs. Since the benefits depend upon the quantity and quality of an individual's labour input, which in turn depends upon the human capital acquired during schooling, the education-wage relationship can be used to measure the returns to schooling. If the objective is to measure the social rates of return, social costs and social benefits of education are to be taken into account.

Critique on CBA: The concept and the methodology of CBA of education is criticized on the following grounds. The measurement of indirect costs and indirect benefits of education ignores the measurement of indirect economic benefits as well as of non-economic benefits of education. Further, earning differentials do not adequately measure the direct economic benefits of education due to labour market imperfections. Second, the opportunity costs measured through proxies are weak and make little sense when used to compare the net gain or loss of undertaking an educational project. It is also argued that education does not make workers more productive but merely acts as a 'filter' or 'screening device' enabling employers to identify those with superior ability. Earning differential (an important component of benefits of education) therefore reflect the screening or certification function of education. Third, CBA does not offer an automatic solution to problems of resource allocation nor does it provide numerical targets. At best, it provides a direction to invest in a particular type of education relative to others. Notwithstanding these limitations, CBA is widely used to evaluate large number of educational projects in both the developed and the developing countries. Combining the costs and benefits of different kinds of education, CBA points out to the need for changes in resource allocation in favour of those types of educational programmes which offer highest rate of return. It also suggests ways of increasing the profitability of education, either by increasing the benefits of education or lowering costs. The CBA is, therefore, useful in guiding investment decisions of funding agencies or donors by showing which education projects are likely to be beneficial. The technique of CBA is, however, likely to be accepted more readily with greater progress in quantification of the indirect costs and benefits of education.

6.2.3 Internal Rate of Returns (IRR) Approach

In the internal rate of return approach, the rate of return to an investment in a given level of education is estimated by finding the rate of discount (r) that equalizes the stream of discounted benefits to the stream of costs at a given point of time. For instance, in the case of university education, it is obtained by computing:

$$\sum_{t=6}^{47} \frac{(W_u - W_s)}{(1+r)^t} = \sum_{t=1}^{5} (W_s + C_u)_t (1+r)^t \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

where (W_u-W_s) is the earnings differential between a university graduate (subscript u) and a secondary school graduate (subscript s, the control group). C_u represents the direct costs of university education and W_s denotes the student's foregone earnings or indirect costs. The costs incurred on getting higher education is for five years i.e. the age between 18 to 23 and the earnings of an individual from higher education is for 42 years (between 23 to 65 age), assuming that the retirement age is 65.

6.2.4 Wage-Income Linkage: MincerianWage Equation

Jacob Mincer (1974) developed a model establishing a linkage between wages earned by people and their level of education. It involves the fitting of a function of log-wages

(LnW_i), over the years of schooling (S_i). The relationship is expressed as

$$LnW_i = \alpha + \beta S_i + u_i \quad \ldots\ldots (3)$$

Where, β is the coefficient on the years of schooling and S_i represents the average change in wage to an additional year of schooling. Thus, β is the 'rate of return' to marginal year of schooling i.e. a percentage change in wage for an additional year of schooling. The change in the wage for every extra year of schooling increases with increase in the level of schooling by one unit indicating an increasing returns to education.

However, once on the job, the experience that an individual gains enhances their productivity and hence gives them a claim for increased earnings. Therefore, the above model can be extended by taking into account the experience on the job as another factor. Thus, the wages become dependent not only on the number of years of schooling, but also on the years of labour market experience (EX). Also, to provide for the productive efficiency of labour declining in performance with age, the square of experience (i.e. EX^2) is added on as a third factor. In other words, this implies that the increase in wages with every unit increase in the experience is assumed to take place at a diminishing rate. Thus, the total wages is expressed as a function of schooling and experience (both measured in time units) and a discounted factor for the incremental wage earned. The Mincerian wage equation would thus be:

$$W_U = LnW_U = \alpha + \beta S_i + \gamma_1 EX_i + \gamma_2 EX_i^2 + U_i \quad \ldots\ldots (4)$$

Thus, the life cycle of earning depicted by the model is an inverted U shaped curve owing to the assumption on declining performance and hence lowered incremental wage returns with age. Evidently, this model is more applicable in case of competitive employment markets. While the expression in (3) is an improvement over the model depicted in equation (2), apart from experience the rate of return to investment in education also needs to be accounted for many other factors like mortality, unemployment, taxes paid, etc. as these factors also determine the demand for education linked to income earned. This is presented in the 'multi-factor extension' below.

6.2.5 Multi Factor Extension

The approaches to 'rate of return' assume an idealistic scenario with no uncertainties and absence of compliance to the norms. In order to get a realistic picture of the factors impacting the earnings of graduates, adjustment needs to be made for factors like real growth in earnings, mortality, unemployment, taxes paid to the government, etc. Thus, the observed earnings of graduates, as given by Psacharopolous and Patrinos (2004), can be represented as:

$$\dagger_m = W_m(1+g)(1-m)(1-y)(1-t) \quad \ldots\ldots (5)$$

where g stands for real growth of earnings adjusted for rate of inflation; m is the rate of mortality, u is the rate of unemployment and t is the tax rate. Using $\dagger_m$ we can arrive at the adjusted net benefit of education as ($\dagger_m - W_u$). Further, groups with different level of education tend to differ in their attributes which too bear an implication on their earnings. Thus, 'ability', which encompasses different kinds of attributes like personality, persistence, intelligence, etc. need to be factored-in. A person with greater ability, if assisted to invest in his human capital, could have greater earnings in his employment. Thus, if Y is total earnings, r is the average rate of returns, C is the total investment for acquiring human capital by way of education and training and X is the earning without investment in human capital formation, we have the following relationship:

$$Y = X + rC \quad \text{......} \quad (6)$$

Where 'r' gives an estimate of the 'ability' of individuals. If the distribution of X is ignored, then the earning would depend upon only the 'rate of return'. In other words, we will assume that the investment cost is held constant. Since 'r' and 'C' are correlated, the amount invested (C) would depend upon the rate of return 'r'. This means, a person who is more able, would get greater returns by investing in education and would also have more incentive to invest than others. The differential wage or the adjusted net benefit becomes $\{(\dagger_m - W_u) * (1-\hat{a})\}$, where â stands for the differential innate ability i.e. the portion of differential earning attributable to one's ability. $\{(\dagger_m - W_u) * (1-\hat{a})\}$ is thus the differential wage attributable to the number of years invested in education, after factoring out the difference in ability. Research has revealed that as much as 33 percent of the private earning differential is attributed to ability and therefore the differential ability needs to be accounted for.

Another factor which needs to be accounted for is the non-monetary advantages in certain jobs. Such benefits might include: collegial environment at work, excursion programs for employees, awards and recognition for performance, etc. A monetary equivalent of these advantages needs to be added as these advantages increase individual welfare. Thus, the rate of return calculated through cost-benefit analysis or through Mincerian wage equation, needs qualification by taking into account many other factors which influence the wages, and hence the rate of return to investment in education. Even after making adjustments to the private rate of return, this approach to determining the private demand for education remains of limited help since it does not account for social costs and social benefits involved.

Check Your Progress 1 [answer the questions in about 100 words in the space given]

1) What is 'human capital formation'? Beyond increasing the productive capacity of the individual, in what other respects is this concept useful?

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2) How is the 'rate of discount' for acquiring a particular level of education (like the Master's degree) defined? Illustrate with the help of an equation.

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3) State the four grounds on which the 'rate of returns' approach is criticised. Also, indicate why it is difficult to delineate the production function of an education process?

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4) On what grounds is the methodology of CBA to education criticized?

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5) State the components considered for inclusion in the Mincerian wage equation? In what way the decline in productivity standards with age is accounted for in this model?

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6) How is the 'differential ability' between individuals accounted for in the 'multi factor extension' model? Why is the consideration of this important?

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6.3 DETERMINANTS OF SUPPLY OF EDUCATIONAL SERVICES

In the interest of equity concerns, the policy planners (i.e. government) need to take into account the social returns from investing on education more importantly than the direct private returns. In this, the significance of economic contribution of education and the objective of focusing on enhancing the 'human capabilities' remains the guiding features of any government policy.

6.3.1 Social Rate of Return

The private rate of return does not take into consideration the social costs involved. It also fails to take note of social benefits comprising of positive externalities like reduced inequality and infant mortality, lower fertility rates, crime and poverty reduction, contribution to R &D, etc. When these are taken into account, the resultant 'r' gives the socially optimal level of investment in education. Thus, whereas the private rate of return compares the cost and benefit of investing in education at the individual level, the social rate of return tells us the optimal investment at the economy level in order to get the best outcomes for the society. It is, therefore, useful for formulating educational policies to decide on the required budgetary outlay to meet the socially optimal educational needs.

The social rate of return can be distinguished for narrow return and wider return (Psacharopolous and Patrinos, 2004). The returns to investment in education considered only by including the subsidies provided by the government amounts to narrow social rate of return. The wider rate of return takes into consideration not only the social costs but also the social benefits in the form of generation of positive externalities. Given that the marginal rate of return reflects the ratio of marginal benefits to the marginal cost, any increase in marginal cost would result in a fall in marginal returns. The human capital being embodied in the person investing in it, and since the cognitive capacity of the individual (like memory, capacity to work, etc.) is subject to diminishing returns over time, there is a resulting increase in the marginal cost of providing education if only the 'human capital' dimension (or the private returns to education) is taken into account. Such a situation leads to a negatively sloped demand curve (Figure 6.2). Additionally, since the marginal cost of acquiring education at higher levels is higher relative to those at lower levels of education, and the foregone earnings at initial levels of schooling is less than that at the later stages of education, the marginal cost curve is positively sloped. Since the optimal level of individual investment (S_p) is attained by equating the private marginal benefit to marginal cost, and for each additional level of schooling, the social rate of return as compared to the private rate of return falls, the marginal benefit curve is shifted downwards. Thus, under the narrow social returns, the optimum level of schooling falls to S_N. However, since education confers externalities upon also those who do not acquire education, the marginal benefit curve is shifted outwards and the optimum level of schooling becomes S_W. Thus, the private optimum number of years of schooling S_P represents an overinvestment in schooling according to narrow social returns (S_N), but an underinvestment in education according to the wider social returns (S_w).

The externalities are not often adequately accounted for while calculating the rate of return to investment in education. This leads to the argument favouring investment in education by the government at a level where the private rate of return to investment in education is optimum (or where the narrow social returns prevails). However, as the theoretical evidence above shows, from the societal point of view, it is the wider social rate of return which is important for which increasing the public expenditure on education remains the key.

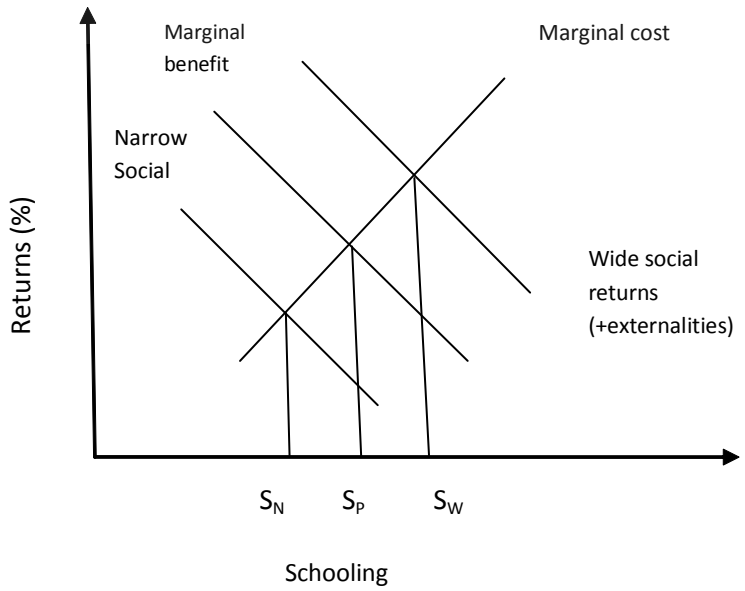

Figure 6.2: Private and Social Optimum Levels of Schooling

Source: Psacharopolous and Patrinos (2004)

Because education depicts the features of both a public good (due to externalities) and a private good (because the benefit of a degree acquired is enjoyed by the individual), it can be categorised as a quasi-public good. However, the degree of publicness or privateness of the education good that is provided would depend upon the mode of funding. Also, the mode of funding would affect how an educational institution functions because it alters their objective. The following sub-section would discuss about how different mode of funds come into play in different kinds of educational institution.

6.3.2 Funding

The sources of funds for an educational institution are: student fees (f), grants (g), donation or endowments (d), etc. These funds are spent on teachers' salary, infrastructure, maintenance/recurring expenditure, subsidies in fees provided to students, etc. An educational institution differs from a production firm in that its objective is prestige maximisation as opposed to profit maximisation. If an educational institution is a not-for-profit institution, the costs incurred equals the revenue. In this case, the cost (c) function or equation may be written as:

$$C = f + d + g \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

More generally, replacing 'd' by f_o for funds received from all 'other' sources the above equation can be written as:

$$C = f + f_o + g \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

Equation (6) can be used to understand how different types of educational institutions manage their funding. Since the school level education can be categorised as merit good, to avoid underinvestment at the individual level, it can be argued that it must be provided by the State. Even at the post-school level or higher education, due to the character of rendering positive externalities to the society, the State has a vital role to play in providing education through public-funded institutions. This is because, as we saw above, when externalities are not accounted for, there is underinvestment in education at the individual or private level. The State, therefore, subsidizes education for students. In this case, 'g' becomes the major source of revenue, with a minimal share of 'f'. If the institutions function as not-for-profit, the implication is not that the revenue would not exceed the cost; it merely means that they operate on non-distributional constraint. This means the excess revenue, if any, need not be distributed as profit to outsiders, but could be reinvested for furthering the objective of the institution.

Apart from public funded institutions, there generally exist many private institutions most of them working as for-profit educational institutions. Such institutions are more commonly found in professional disciplines (like engineering and medicine) although they are also present in school level education. They either do not get any grants from the State or get one time offers like concessional land or grants-in-aid for admitting students from socially disadvantageous groups. In such cases, 'g' may be negligible with the cost 'c' mainly met out of funds generated from student fees. A third category of institutions are those operating under public-private partnership (PPP) as discussed in section 5.4 of Unit 5.

The objective of all the above types of institutions would differ, which is majorly determined by the nature of funding. The objective would in turn determine what kind of education is provided to the students or to whom is the education provided. Therefore, in order to understand the provision of education, there is a need to understand two important questions: a) what is to be funded? and b) how is it funded? As would be seen in succeeding paragraphs, the former would in turn be affected by the latter. The

diagram below (Figure 6.3) shows the various possibilities of funding mechanism of education, which determine the nature of its provision. The horizontal axis shows what is funded i.e. is it the input that is funded or the output? The vertical axis shows how it is funded i.e. whether the funding is centralised and regulated or is decentralised and market driven. Based on these considerations four funding mechanisms that emerge are as follows:

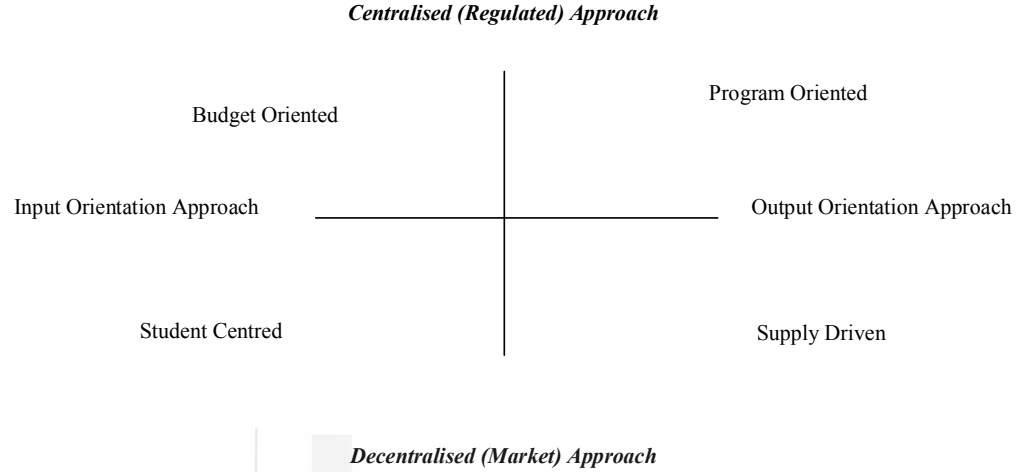

Figure 6.3: Funding Mechanism

***Source**: Jongbloed (2007)*

i) **Planned, Budget Oriented, Input-Based Funding**: The allocation is based on requests (i.e. budget estimates of cost) submitted by the institutions. It is input-based funding with the inputs being the graduates. The budget allocation is related to the previous years' allocation of specific budget items. With some increase to account for price rise, it is largely aimed at continuation of services offered to the society. Such funding is mostly done by the government agencies with freedom accorded to the educational institutions in terms of the courses and programs offered. The programs offered need not necessarily be oriented to the market needs although skill development would be an essential thrust. This means that greater focus could be on conventional courses having fundamental relevance (like basic sciences). This also means that the institutions would be accountable to meet the larger national needs with a focus on the fundamental research needs of the society.

ii) **Performance-Based Program Oriented Funding**: Here, the funding is by a centralized system with the criterion of fund allocation being the 'output'. The funding is mostly by the government but the institutions are allowed to compete with each other in terms of their output (i.e. in terms of students graduated or ranking). Collaboration with private players is permitted here. Due to the involvement of private players, there is a tendency to match the market needs in terms of curriculum and courses offered. The nature of research might vary and are likely to be marked towards output that is marketable. This is in the sense of orientation of programs being towards applied research helpful in raising funds from private players.

iii) **Supply Driven and Purpose-Specific Funding**: This is also a market-oriented system in which the funding is mainly provided by private funders. Under this, higher educational institutions usually compete with each other to secure funds from the funding agencies. Alternatively, the funding agencies might themselves seek the services from the institutions for the sake of cost effectiveness. It is a decentralized funding system having the motivation for profit making. Funds are

provided to only those institutions which demonstrate scope for earning profits from the project.

iv) **Student-Centric, Demand-Driven, Input-Based Funding**: This is another market oriented approach aimed at initiating competition among educational institutions. The schools or universities compete to provide quality service in terms of the relevance of the courses offered and other facilities. As a result, only the job market oriented courses demanded by the clients (students) are offered. Under this, students reign supreme with institutions being accountable to them.

The principle of funding of an educational institution therefore can range from market-orientation to fully State funded or partially subsidised ones with different mechanisms existing to explore the funding for the educational services offered. In the next section, we shall dwell upon some of the specific alternative mechanisms practiced in other countries in the matter of funding of educational institutions.

6.4 ALTERNATIVE SOURCES OF FUNDING: INTERNATIONAL EXPERIENCES

With its spill-over effects in the form of positive externalities, education exhibits the elements of a public good (although in its strict sense it is a merit or a mixed good). This underlines the important role of the State to be in the centre stage of investing in education. However, over the past three decades, beginning from the early 1990s, with a gradual increase in the policy tilt towards market oriented measures, other methods of funding education have come to be explored internationally.

Early 1990s witnessed introduction of Structural Adjustment Programmes (SAPs) in developing countries with International Monetary Fund (IMF) and the World Bank extending loans on the pre-condition of encouraging private sector participation and effect a cut in public expenditure, particularly in social sector government spending. Consequent to this, there has been a growing focus/concern for diversifying the sources of funding of education sector. The underlying rationale suggested is that the private rate of return exceeds the social rate of return and therefore the students being the beneficiaries must pay for their education. As seen in the previous section, there are sources of funding education other than the State, oriented towards market. The following are some of the alternative methods of funding education, particularly in higher education, as practiced in some countries.

a) **Educational Loans**: These are particularly used at the higher education level. The argument is that students can get loans from the banks and manage to return after taking up employment. While this is supposed to increase access to education, capital market imperfections remain to be duly addressed. For instance, since the loan is meant for acquiring human capital that gets embodied in the students subsequent to completion of degree programs, it cannot be offered as collateral by the students. This would restrict students from underprivileged sections from being able to produce the required collateral insisted upon by the banks. Further, uncertainty with respect to future employment opportunities may act as a deterrent to availing education loans. On the lender's side, there is information asymmetry by way of not knowing the abilities and the future career path of students compounded by the difficulties posed by the high international mobility of students.

b) **Graduate Tax**: This is levied on graduates, rather than as a levy on all taxpayers, for financing higher education. The tax imposed needs to be paid only after their income exceeds a certain threshold limit. This is thus a method of raising the

educational costs directly from the primary beneficiaries from their future earnings. The payment is deferred to a future time period, making higher education free at the time of investment. This method has been tried in the United Kingdom and Ireland.

c) **Student Vouchers**: Students who have satisfied the eligibility conditions are provided with vouchers (coupons) representing a certain amount of money to be spent on education. The value of voucher could be related to the average per capita costs of education, to the family income of the student, or the type of course. Milton Friedman in 1950s argued for this voucher system stating that it would improve the schools and their cost efficiency. The argument was that students would be more empowered and universities would engage in competition to attract students which would make them inclined towards raising quality. There is, however, a disadvantage in this system as education being an 'experience good', students can gauge the quality of education only after they have invested and experienced it. This, therefore, leaves the students susceptible to misinformation by the educational institutions. Some of the countries which have implemented this method at the school level are Chile, Europe, Ireland, Hongkong, Sweden, Pakistan, United States of America. In India, student vouchers have been provided under PPP initiative in Uttarakhand. There have also been such schemes in the state of Rajasthan and Madhya Pradesh.

d) **Income Contingent Loans**: These are also education loans provided to the students with repayment depending upon the students' future income. Because the repayment is dependent on future income, it is feasible for low earners also to avail of these loans. It would give sovereignty to students with respect to choosing their universities and courses. This method would lead to better inclusion of students from economically disadvantaged sections of society than education loan would. The USA and the UK provide this mode of funding to students.

5) **Deregulation of Fees**: Against the backdrop of pruning of public funds to education sector, there have been arguments with respect to raising student fees to cover the cost of education. This is principally argued to give financial freedom to the educational institutions making them accountable to the immediate students body avoiding any kind of wastage. However, in a developing country like India it might lead to exclusion of able students belonging to economically disadvantaged group and is particularly true in higher education. In India, various committees like Punnayya Committee, CABE committee, National Knowledge Commission, etc. have recommended raising the tuition fees at higher education level in the wake of paucity of public funds. Following its implementation, the fee structure at IITs and IIMs is now close to their costs. In UK and US, fees are deregulated in most universities. In the US full-cost fees are common and private sector is well established.

Check Your Progress 2 [answer the questions in about 100 words in the space given]

1) Distinguish between the 'private rate of return' and the 'social rate of return'. How is the latter useful in providing inputs for education policy?

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2) How is 'narrow social rate of return' and 'wider social rate of return' distinguished?

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3) Why would you say that even in respect of higher education keeping the public expenditure level high is merited? In the context of funding, what is meant by non-distributional constraint?

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4) What are the four type of funding mechanisms under the PPP arrangement? Also state the four methods of funding arrangement depending on whether the focus is kept on serving the society or the market.

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5) Which one of the funding arrangements focuses on promotion of fundamental research of value to the society? How?

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6) What are the positives and negatives of 'educational loans'?

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7) How does the method of 'student vouchers' work? On what ground is this criticised?

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8) How are 'income contingent loans' more socially inclusive in its character?

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6.5 CONDITIONS FOR OPTIMUM INVESTMENT IN EDUCATION

The equilibrium level of investment made by an individual depends upon the rate of return that they would get from that investment and the amount invested. The rate of return they would get also signals their ability, implying that the abler individuals would invest more in their education than the less able ones. The ability therefore reflects the demand side factor for an individual to invest, with the amount of money invested representing a supply factor. The total amount invested in human capital depends therefore upon both the demand and supply conditions. This subsection deals with the demand and supply behaviour of investment in human capital, as postulated by Becker (1975).

6.5.1 Becker's Demand and Supply Curves

The demand curve for investment in education, as for other goods, is negatively sloped. This is owing to its declining marginal rates of return (i.e. ratio of 'marginal benefits to investment' to 'marginal costs of investment') over time. Further, with additional accumulation of human capital, the marginal rate of return declines due to reasons like: (i) human capital, embodied in the individuals, experiences diminishing returns over time; (ii) the foregone earnings increase with increase in the time spent in education; and (iii) since the later investments are costlier than the earlier investments, the marginal cost of former is higher than the latter. In contrast, the supply curve of educational services reflect the marginal cost of financing education measured as the rate of interest to finance additional amount of capital required beyond the normal abilities of households/ individuals. The supply curve is upwards sloping owing to the segmented capital market by which is meant the heterogeneity in the sources of funds available with the different sources having different costs attached to them. Further, there are subsidies given to public schools and scholarships to students which would reduce the financial burden of students for their recipients. Additionally, with the transaction costs incurred on borrowed funds, a person willing to raise resources to invest in accumulating more human capital will shift from the cheapest source of fund to the next cheaper and eventually to the most expensive. This feature of raising the required amount of investment keeps the supply curve not only positively sloped but also in a step-wise manner as shown in Figure 6.4.

The first cheapest resource available to an individual investor are the gifts from parents, foundations and government. Since these are without interest or any other cost, the supply curve for this level of capital is represented by the Oe segment, lying along the horizontal axis (Figure 6.4). As an individual moves from school to the higher education, highly subsidised but not free loans could be used as a source of funding. Since these are more expensive than the above source of free funding, this is represented by the *hu* segment of the curve. After this comes the sources of individuals themselves, like personal wealth and inheritances, which could have been used elsewhere and therefore comprise of foregone opportunities. Their cost is given by the *vi* segment of the curve. After all these sources are exhausted, the investor goes for commercial loan, available at a higher cost and hence is represented by the upward sloping part of the curve, *Js*.

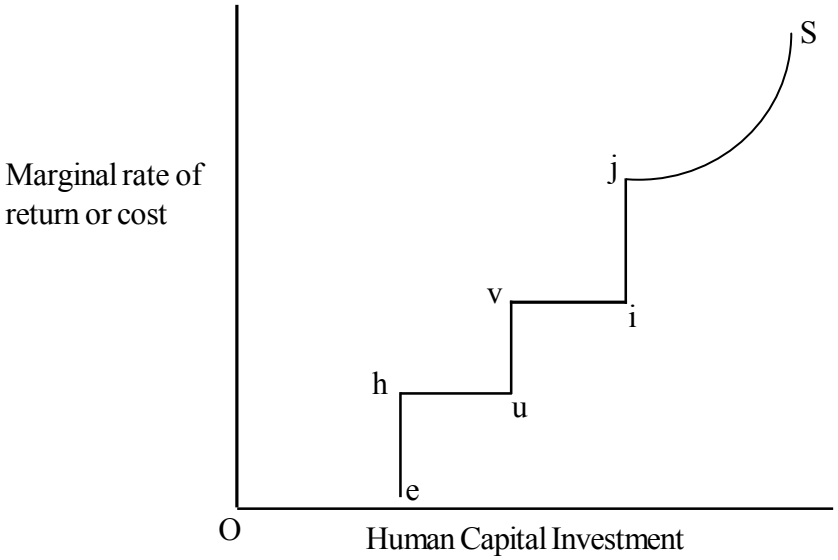

Figure 6.4: Supply Curve for Investment in Human Capital

Source: Becker (1975)

6.5.2 Elite Approach to Determining Investment Levels

Becker (1975) established a link between the ability of individuals, their earnings and their decision to invest in education. He explained this by his 'elite approach' signifying the difference in investment decisions by individuals due to their varying capacities to do so. In other words, an 'able' person would show greater incentive to invest more in education enabling him to earn more in the labour market later. The elite approach assumes that the opportunities available to individuals and the level of investment to be made are the same for all and any difference in the investment levels is due to difference in their abilities. Thus, the word 'elite' here refers to the ability of persons to raise the required level of investment.

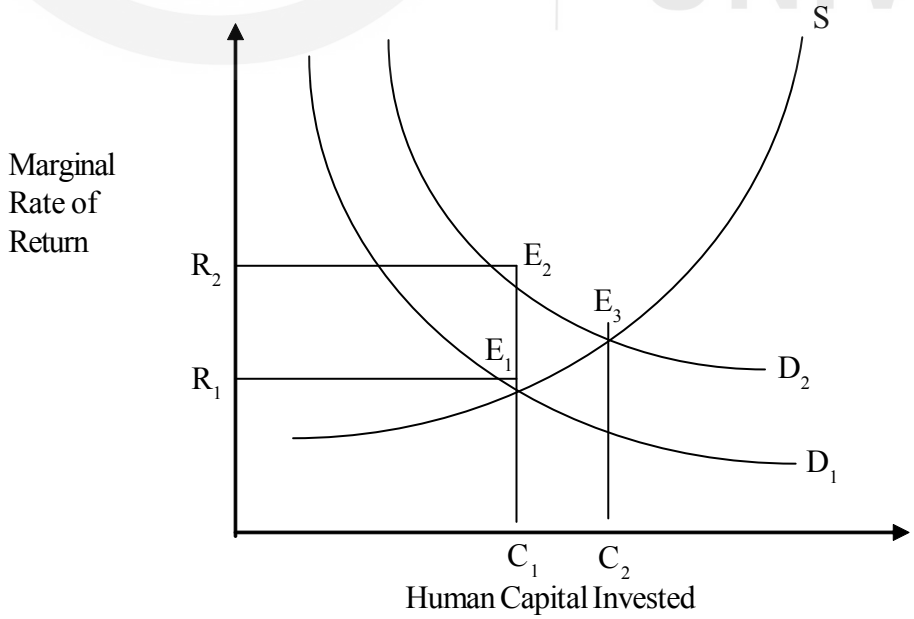

Figure 6.5: Equilibrium Levels of Investment Resulting from Differences in Abilities

Source: Becker (1975)

Figure 6.5 shows the equilibrium levels where the demand curve D_1 is intersecting the supply curve S at the point E_1, giving the rate of return R_1 for an optimal investment C_1. For an abler person, the same level of investment (i.e. C_1) would render a higher rate of return R_2. A 'locus' of all these higher rates of return, with their corresponding levels of investment in human capital, would lead to an upward shift in the demand curve D_2. In other words, the upper demand curve is that of an abler person, which intersects the supply curve at E_3, for an optimal investment level of C_2. Because the ability would give higher rates of returns in the labour market, there is an incentive for the abler individual to invest more. The optimal investment of an abler person therefore exceeds that of a less abler person establishing that 'ability' as a factor plays a deciding role while making investment decision in education.

6.5.3 Egalitarian Approach to Determining Investment Levels

The egalitarian approach to understanding the difference in investment for education emphasises on how the differences in opportunities affect the education supply curve and hence the equilibrium outcome. Every individual has different environment rendering different opportunities. Some of the environmental factors like family wealth, scholarships, etc. offer opportunity not available to many others. Since it is the *ability* of an individual that goes into determining the amount that an individual can raise from different sources to invest in education, and this differs widely between individuals, the egalitarian approach considers that the difference in the capacity to invest between individuals mainly arises by the differences in the opportunities available for raising resources to invest in education. Becker (1975) argues that the major cause for differences in opportunities is the availability of funds. Some of the reasons which can lead to better accessibility of cheaper funds to some more than to others include: a) some may live in areas providing liberal government and other subsidies to investment in human capital or receive special scholarship because of luck or political contacts; b) some are born in wealthy families and have generous parents; c) some succeed in borrowing on favourable terms; etc. Persons with favourable conditions would invest relatively large amount in themselves which leads to a rightward shift in the supply curve. This would cause a shift in the amount invested in the human capital (Figure 6.6). In this scenario, only the supply conditions vary, with supply curves S_1 and S_2 intersecting a common demand curve, D. The persons having more favourable supply conditions would have lower supply curve, represented by S_2 than persons having less favourable supply conditions, represented by S_1. The amount of human capital invested therefore exceeds for the former than the latter.

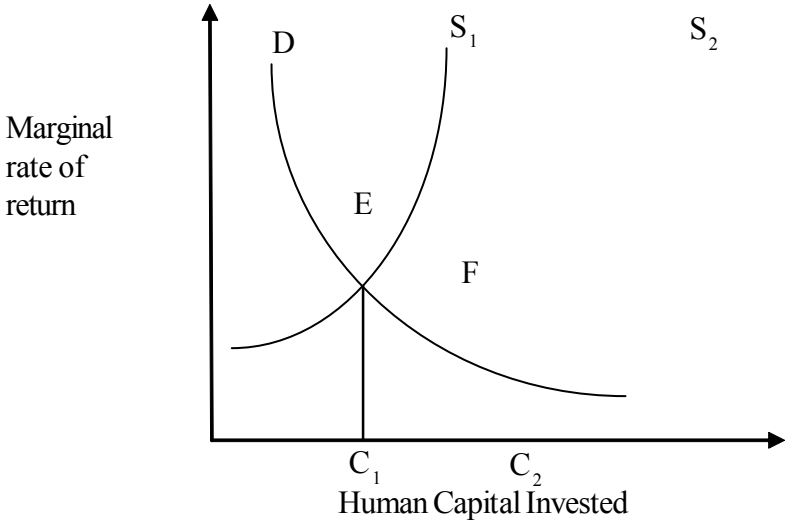

Figure 6.6: Investment Decisions with Differences in Opportunities

***Source**: Becker (1975)*

6.5.4 Equilibrium Level of Investment

As discussed already in the sub section 6.2.5, the earning, Y, depends upon ability given by 'r' and the amount of expenditure invested in education, C. The simple form of the equation explaining the relationship between these factors can be written as:

$$Y = r\,C \quad \ldots\ldots (9)$$

The earnings (Y), which is a function of the rate of return earned over the capital (C) invested, would be determined by the distribution of ability and the opportunities of education seekers in the population. In case of egalitarian approach, with r constant, the earnings Y would be as skewed as the amount invested in human capital C i.e. the more C is unequally distributed and skewed, the more unequal and skewed will be the distribution of supply curve and hence the earnings, Y. Similarly, in the elite approach, with the amount of human capital invested held constant, the distribution of earnings would be as equal or unequal as would be the distribution of ability. However, the supply conditions are not independent of the demand conditions. For instance, the abler individuals are able to get scholarships from the State and have lower supply curve. The positive correlation between amount invested and the ability of individuals would mean that the earnings would be more skewed than the skewness of amount invested and/or ability of individuals. Figure 6.7 presents this scenario of positive correlation at points e, i and k, where both the ability and opportunities increase at the same time. There might be negative correlation also between the supply and demand conditions. For instance, a war or untoward social circumstances may reduce the

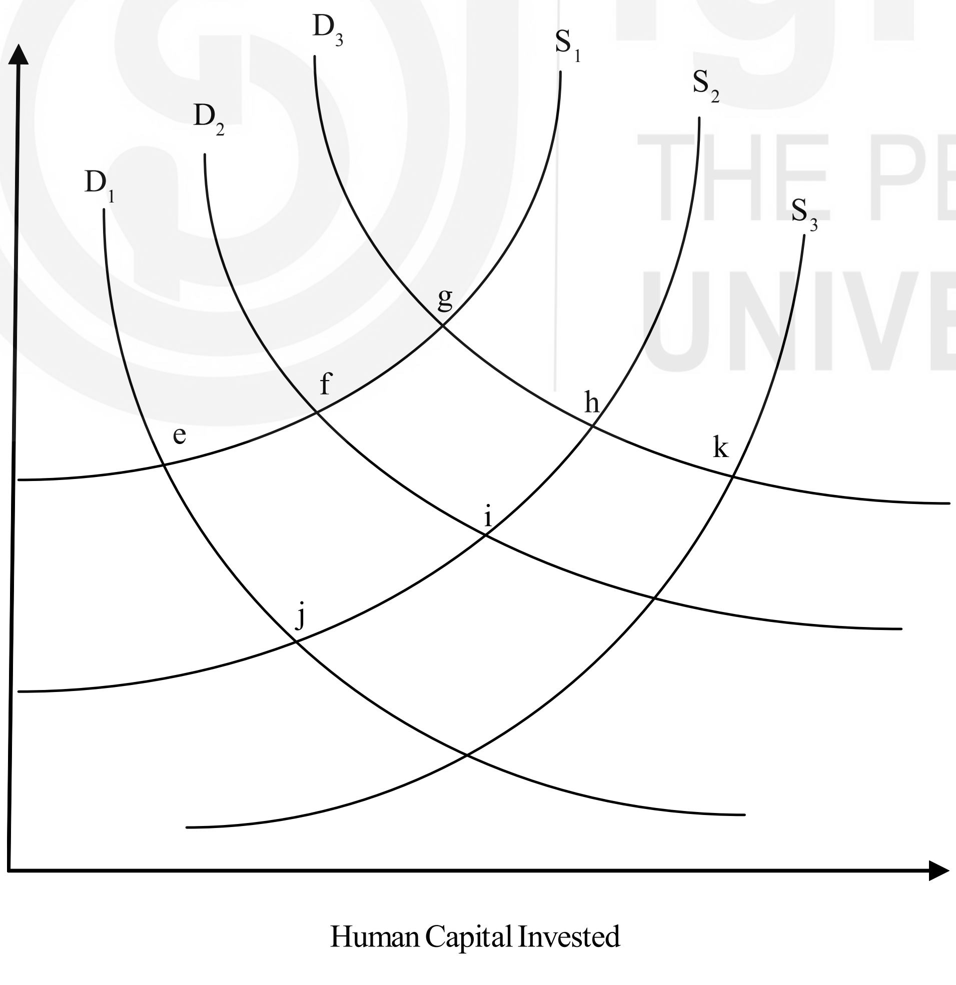

Figure 6.7: Equilibrium Levels of Investment in Human Capital Resulting from Differences in 'Abilities' and 'Opportunities'.

Source: Becker (1975)

amount of scholarships available to the students including the abler ones. The equilibrium in case of negative correlation is presented at points f, i and j. The egalitarian and elite approaches to investment in education depict a no correlation scenario. For instance, in the figure equilibrium under the elite approach could be depicted at the points e, f and g.

A Mathematical Exposition: The human capital theory considers educational choice as an investment decision by individuals with the expectation that it would enhance their future earnings for the current income opportunities foregone in exchange for education. In other words, people will compare the present discounted value of the future earnings with the expenditure on education in order to arrive at a decision on investing in a certain level of education. This is similar to the case of physical capital, where marginal investment is made up to the point where marginal productivity equals the marginal cost. Broadly, therefore, the demand for education can be arrived at and can be expressed as:

Demand for education = f (costs of acquiring education, expected future gains relative to the present, ability of individuals, school characteristics, present level of human capital).

The factors that lead to the identification of the main determinants of investment in education can be explained as follows. Suppose the life of an individual $i=1,2,3....n$ is divided into two periods: youth (up to period t) and adulthood [beyond period (t+1)]. The individual i would devote a fraction of their life (S_{it}) in acquiring education thereby increasing their stock of human capital (H_{it}). The acquiring of human capital being a time taking activity, and owing to its declining physical and mental capacities over time, there is a depreciation effect over time. Thus, human capital accumulated after leaving the school, with a base level ability obtained (H_{it}) up to the school level is given by:

H_{it+1}= ä H_{it} + H_{it} (1-á) .... (10)

Where á is the rate of depreciation and ä is the addition to the stock of human capital from period 't' to period 't+1'. There are many factors which determine the change in the human capital stock. These are: (i) unobservable ability, A_{it}, which gives some individuals higher advantage over others; (ii) more resources employed, E_{it}, which helps in better quality of human capital produced; and (iii) since with more time spent in school the foregone earning increase, it is assumed that there are decreasing returns on time spent in school. In other words, while the cost of funding education increases, the returns to investment, with more time spent in the post-school stage, declines. Thus,

äH_{it}= f ($A_{it,}$ $E_{it,}$ $S_{it,}$ H_{it}) .... (11)

When individuals enter the labour market after acquiring post-school level higher education, their earning prospects are supposed to increase. Thus, assuming that they are rewarded as per their marginal productivity rate â$_t$, their earning, W_{it}, would be given by:

$W_{it}(H_{it})$ = â$_t$ H_{it} .... (12)

In order to acquire education, one incurs various direct and indirect costs which can be denoted by ã$_t S_{it}$ (where ã$_{it}$ is the direct cost of school attendance) and $S_{it}W_{it}$ is the indirect cost incurred (i.e. share of wages foregone). Since an individual seeks to maximize the discounted value of his net earnings, in order to reach an optimal level of investment decision subject to the constraints (10) to (12) [i.e. the difference between his earnings and costs of acquiring education], the objective function can be written as:

Max V_{it}= $W_{it}(H_{it})$ - S_{it} $W_{it}(H_{it})$ - ã$_t S_{it}$+ {$W_{it+1}(H_{it+1})$ – $S_{it+1}W_{it+1}(H_{it+1})$ - ã$_{t+1}$ S_{it+1}}/ (1+ñ)

Using (12) in the above, we get:

$$\text{Max } V_{it} = â_{it}H_{it}(1-S_{it}) - ã_tS_{it} + \{â_{it+1}H_{it+1}(1-S_{it+1}) - ã_{it+1}S_{it+1}\}/(1+ñ) \ldots\ldots\ldots\ldots (13)$$

The first order condition with respect to S_{it+1} gives the condition for equilibrium as:

$$â_tH_t + ã_t = (â_{t+1}/1+ñ)\,(á\,äH_{it}/S^*_{it}) \ldots\ldots\ldots\ldots (14)$$

In equation (14), the left side gives marginal cost and the right side, the marginal benefits. In other words, each individual would try to invest till the point where the cost of acquisition is equal to the benefits of acquisition.

The above analysis gives the individual or the private demand for education from investment point of view. The market demand needs to be arrived at by adding the demand of all the individuals. However, one has to be careful that unlike the demand for most commodities, education may not be demanded by the entire population. Hence, the demographic composition of a country is an important predictor of the total demand in a country. Ceteris paribus, the demand will be higher in the country with more population in the younger age-groups.

Check Your Progress 3 [answer the questions in about 100 words in the space given]

1) State three reasons as to why the demand curve for education is negatively sloped?

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2) What is the central thrust in the Elite approach to investing in education advanced by Becker?

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3) What is the impact on the supply curve, with the factors identified by Becker in his egalitarian approach, contributing to providing a better opportunity for raising funds for some than others for investing in education?

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6.6 LET US SUM UP

At the macro-level, there is a strong justification for the demand for educational investment by the State as it leads to augmenting the growth rate of an economy. The individuals invest in human capital formation due to the expected future income streams and consumption benefits. The rate of return approach to investing in education ignores

the consumption part and applies only a cost benefit analysis in which only the direct monetary benefits is taken into account. The concept of human capital linked to higher future personal income streams is used as a justification in the policy circles to reduce the subsidy or the State support for investment in education. However, given the positive externalities and the social rate of return to education, the role of State in funding education (to avoid the consequences of a sub-optimal investment based solely on private rate of return) is very important. Nevertheless, there have been arguments in support of alternative modes of funding education and is practiced in many countries. There is, however, a need to look at the applicability of different modes of funding and its implications from the point of view of equity concerns in developing countries like India.

6.7 KEY WORDS

Public Private Partnership : Refers to an arrangement between public and private sector, where private sector provides a public good in collaboration with a public sector institution by either contributing in management expertise, technical expertise and/or funding.

Signaling Incentive : Refers to the incentive or benefit that an agent gains by providing appropriate/required signals.

Instrumental Role of Freedom : Refers to the way different kinds of rights, opportunities, and entitlements contribute to expansion of human freedom and thereby development.

Substantive Freedom : Refers to the ability or choice that individuals can make to achieve outcomes which they have reason to value.

Agency Role of Individual : The agency role of an individual entails their role as a member of the public and as a participant in economic, social and political actions. The agent is someone who acts and brings about change and whose achievements can be judged in terms of her own values and objectives, whether or not we assess them in terms of some external criteria.

6.8 SOME USEFUL BOOKS AND REFERENCES

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10) Sen, Amartya (2000), *Development as Freedom,* Oxford University Press, New Delhi.

6.9 ANSWERS/HINTS TO CYP EXERCISES

Check your progress 1

1) See 6.1 and answer.
2) See 6.2.1 and answer.
3) See 6.2.1 and answer.
4) See 6.2.2 and answer.
5) See 6.2.4 and answer.
6) See 6.2.5 and answer.

Check your progress 2

1) See 6.3.1 and answer.
2) See 6.3.1 and answer.
3) See 6.3.2 and answer.
4) See 6.3.2 and answer.
5) See 6.3.2 and answer.
6) See 6.4 and answer.
7) See 6.4 and answer.
8) See 6.4 and answer.

Check your progress 3

1) See 6.5.1 and answer.
2) See 6.5.2 and answer.
3) See 6.5.3 and answer.