CHAPTER 2
EDUCATION AND THE ECONOMY

2.1 INTRODUCTION: INTERRELATION OF MARKETS IN TWO SECTORS

Skill is a produced factor of production. In this sense it is different from ordinary labour which may be called a natural factor of production. Analogous to the concept of capital, therefore, skill has been described as "human capital".\(^1\) Whereas the supply of ordinary labour could be assumed as given (by population growth) in an economy, the supply of skilled labour presupposes an activity of skill formation through investment in education and training. The investment in skill formation could be analysed by looking at the supply and demand interrelations in two sectors, viz., education and the rest of the economy.

In the education sector the forces of supply and demand operate through the supply of and demand for places. They determine the investments in education for the purpose of providing the places and for obtaining the education provided respectively. In the rest of the economy the markets concerned are the Commodity and Labour markets and the Capital market for investible funds for education.

The commodity market concerned is the market where goods as well as services are supplied and demanded the

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\(^1\) See Walsh (1935), Bouman (1966), and early literature in economics of education.
production of these involving the use of skill of a given kind. The labour market is the market where skilled labour of given grades and categories are demanded and supplied as produced factors of production. The capital market is the market where the funds required either by individuals or institutions for investment in education and training are supplied and demanded.

Skilled labour is an input in the production of commodities. The production function used in the commodity market, in conjunction with the demand for goods and services determines the demand for skilled personnel in the labour market. A change in this demand for skilled labour is reflected in the education market in two ways. First, there would be a change in the demand for education and training as revealed by individuals through their willingness to invest in their own education. This determines the propensity to invest in human capital in the "individual" domain. Second, there would be a change in the supply of places and facilities for education and training as revealed by institutions and governments through their investment in providing such places and facilities. This is investment in human capital in the "institutional" domain. The demand for and supply of educational services in the education market determine the equilibrium level of skill formation in the economy. To complete the circle of interrelation between markets in the two sectors of education and the rest of the economy, the equilibrium level of skill formation in the
education market determines the supply of skilled personnel in the labour market and hence affects the volume and quantity of output available in the commodity market.

2.2 THE ECONOMY: MARKETS

To highlight the forces of demand and supply in the education sector and the rest of the economy, it is necessary to understand first the constitution of the markets. We shall describe the relevant components of the commodity, labour, and capital markets in the context of investment for skill formation and refer to these three conventionally defined markets together as "the rest of the economy". We contrast it with the sector of "Education" where skill formation takes place. We shall elaborate on the composition of the supply of and demand for education in what can be seen as the education market.

The distinction between the rest of the economy and education as two sectors is, of course, contrived. It is made principally to emphasize the characteristics of investment in education and training which are not necessarily shared by the "normal" markets of the economy of labour, commodities, and capital.

The Commodity and Labour Markets

We have already mentioned above by implication that the demand for skilled labour is a derived demand dependent on the production functions of the commodity market. It is
precisely because of this link that the labour market cannot be treated in isolation from the commodity market. However, as regards the demand in the education market the commodity market is expected to play its role only through the labour market. It is, therefore, the demand for skilled personnel in the labour market which has a direct bearing on the education market. Because of the intricate relation between the commodity and labour markets our reference to labour market in the context of skill formation should not be understood as isolated from the commodity market neither our reference to commodity market taken as bypassing the labour market. On the contrary, our reference to the rest of the economy or to the market as such should be interpreted as to include both these markets.

**Three sub-sectors:** Broadly speaking, the demand for skilled personnel originates in three sub-sectors of the labour market which may be described as follows: (a) the Government sector, particularly with respect to the demand for manning its bureaucracy and the national defense, (b) the industry and business sector - comprising both the public and the private enterprises, and (c) the professional sector consisting of (i) the non-academics, like lawyers, accountants, engineers and doctors, and (ii) the academics, like teachers, scientists, and all other research personnel.

**The Capital Market**

The existence and the form of a capital market can enhance (or put a limit to) the ability to demand or supply
education through the provision of investible funds for skill formation to agents in both the individual and the institutional domains.² However, in most countries such a capital market catering specifically to the education sector either does not exist at all or at most exists in a very rudimentary form.

The normal capital market being a highly differentiated market with unequal access the availability of funds for educational investment is usually highly regressive, being dependent on the class-nexus of the investing individual. As a result, the market enhances or inhibits the ability of different classes of people differently. Some form of capital market might, however, operate through banks, charitable institutions and agencies in providing personal educational loans at cheaper rates to all sections of the people. It would be the absolute size of such market which would determine the investment which ordinary individuals can undertake in their own domain of educational investment.

The capital market catering to educational investments in the institutional domain is also usually underdeveloped in most countries. The normal capital market does not provide easy loans to educational institutions in the sense that these institutions have to compete against commercially profitable projects of investments. The rate of interest

² The implications of the size and the form of the capital market in determining the capacity of the various agents to invest in skill formation is discussed in Chapter 5 (section 5.4).
becomes, therefore, almost prohibitive for such institutions. This would usually have a strong bearing on investment in skill formation because grants and endowments, which are the other normal sources of capital for these institutions may be very limited. However, in the institutional domain of investment, a large part of long-period capital investment in skill formation would be financed by international funding agencies like the International Development Association (IDA), World Bank, etc. These agencies may provide loans as well as aid for specific educational projects, and their educational loans usually bear nominal rates of interest. In this sense it could be said that a capital market exists, sometimes on a global scale, to finance investment on the supply side of the education market.

2.3 THE EDUCATION MARKET: SUPPLY

Tracing the origin of education and training, it may be conjectured that initially education was supplied by the individual tutors in the earliest form of the single-teacher schools, like the teaching of various skills in the "aashramas" of the "sanyasi gurus" in ancient India. So far as skill-oriented education, as different from liberal and philosophy oriented education, is concerned, such process of supplying education and training could be said to have prevailed over time in imparting traditional skills of great

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3 H.H. Wein (1968, p. 296) in this regard concedes that "it requires considerable effort on the part of college administrators to obtain the requisite gifts and grants and endowments".
excellence, say, in various branches of arts and crafts. Training in these skills were imparted by the master craftsmen. Such skill formation was, however, concentrated mostly in the unorganized sector of an economy. In the modern times, such training is now supplied in the organized sector on a larger scale and in more systematic manner, for example, in the form of on-the-job training in the firms for skills ranging, for example, from diamond cutting, taster-wine tasting etc. to very specific fields in engineering and technology. In this, the industrial and service firms have come to play an important role of supplying facilities for education and training. Over and above this largely informal source for the supply of training, there is the more formal and largest source of education, namely, the formal institution of schooling. Formal educational institutions are, however, both public and private, the fundamental difference between them being that the public educational institutions are essentially non-profit organizations whereas the private training institutions are basically profit-making entities.

The agencies for the supply of education, therefore, now fall into three categories. First, are the firms supplying education through on-the-job training. These could be also historically the very first providers of training for specific skill formation, the need for which was felt within the firm. Second, came the private training institutions supplying vocational training for profit. It is
quite conceivable that in most countries, long before skill formation becomes a respectable objective of colleges and universities, it is only these profit-making technological institutes on the periphery of the industrial firms that provide education to the would-be skilled workers. Finally, there will be the non-profit institution of the formal school which would supply education through colleges and universities. We shall briefly elaborate on the nature of each of these three classes of agencies of skill formation below.

It is to be noted, however, that the above three institutional agencies for supplying education and training are not similar to each other with respect to either the purpose of the agents concerned or the method and curriculae involved. We shall here describe only the nature of the activities of these agents. The purpose of the concerned agent will be spelled out in subsequent chapters when they are discussed in details.

On-the-job Training in Firms

Education for skill formation through on-the-job training is supplied by the firms - ranging from professional firms in the service sector to industrial firms in the production sector. On-the-job training could, therefore be either professional training imparted to apprentices in, say, law, accountancy, and banking, or it could be highly specialized training in the technical lines. Although the actual degree
of specificity or generality of any training programme from the point of view of the firm supplying it depends particularly on the form of the market, it could broadly be said about these two types of on-the-job training that whereas the first belongs mainly to the general category, the second is supplied usually for the specific categories of skill formation. 4

The provisions of on-the-job training ranges from the supply of informal instructions and guidance over the work only, to arrangements for formal off-the-work training sessions as well. Examples of the training provided on-the-job include the recruitment of fresh graduates and diploma holders at the apprentice or trainee level as well as the training of the existing employees according to the needs of technological change. Such facilities and services of skill formation, therefore, caters to a wide variety of personnel both in the professional as well as in the industrial lines of occupation.

In the industrial sector, on-the-job training supplied by the firms now covers mostly refresher courses for the retraining of employees ranging from blue-collar operating personnel to executive level technical and managerial personnel. The significance of on-the-job training programmes is, however, not as vital and all-embracing as it

4 For distinctions between the specific and general categories of skills, see Becker (1975, pp. 16-37). Various other aspects of on-the-job training have been highlighted in Mincer (1962). See Lazear (1976) for further references.
used to be in the initial phases of industrial revolution. During those periods almost all skills required in an industrial organization had to be formed right from the scratch because formal educational institutions did not produce skills according to the needs of industry nor were there many profit-making training institutions at that time. Gradually with the development of formal teaching-schools and private training institutions, industrial firms could draw on the ready-made skills available in the labour market. The vintage effect which makes each generation of newly trained personnel better and more productive over the older vintage skills have made it possible for the firms to minimize the need for on-the-job training of the new recruits. For these skilled personnel the firms need only to provide some orientation courses which usually make a part of the production process itself. In spite of these trends, however, at the level of building up very high quality and technically specific personnel, on-the-job training still bears significant importance in large enterprises of, say, the multinational corporations. Particularly, in the defense sector, skills are still formed basically through on-the-job training, although military schools and colleges have been established in many countries.

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5 For implications of vintage effects on skill formation, see Sen (1964, 1966b). See also, Whitaker (1966).

6 For examples of specific cases, see fn 50 in Chapter 6.
Training Institutions Run for Profit: Private Training Institutions

The profit-making training institutions are the private vocational and technical schools which provide training to would-be skilled workers for plain profit. These institutions are often, historically, firms which grew in the periphery of the industry catering to its needs of skilled manpower. Eventually many productive firms within the industry also changed their character and used their experience of training personnel for their own purpose to produce skilled labour solely or mainly for other firms. This transition in the character of some productive firms occurred, for example, during the early phases of the industrial revolution in Britain. However, because the profit-making institutions are eventually competed out of the market by the non-profit schools in the field of higher categories of skill formation, the former tend to supply specialized and vocational training, mainly for the medium level skills. Personnel who acquire the skills supplied by these training institutions qualify themselves for taking up medium-level jobs or professions directly in the labour market. Examples of such profit-making training institutions range from small singular institutes to large polytechnics and engineering institutions supplying training through diploma courses in fields like journalism, secretarial practice, typewriting, textile designing, radio and television mechanics, aircraft...

7 For examples, see fns. 27 and 28 in Chapter 6.
maintenance engineering, computer programming and many other such lines of specializations.

There is a second category of profit-making teaching institutions which are comparatively of more recent origin. They develop as peripheral adjuncts to the formal system of schooling. In fact, they thrive on either the difficulty of meeting the admission requirements of "proper" schools, or on the need of students to get remedial teaching in order to cope with the pace set in such schools. These institutions may be described as the "teaching-shops" rather than as training institutions proper. The teaching-shops supply education through short-duration crash programmes of coaching and guidance for preparing individuals to take competitive examinations to qualify for admission into the formal system of higher education and also sometimes for entrance into certain categories of jobs. Examples of these teaching shops supplying such educational and training services are the innumerable coaching and tutorial centres preparing candidates for Institutes of Technology entrance examination, Medical College entrance tests, and for the Civil Service, Bank Probationary Officers' etc., competitive examinations respectively.
The Non-profit Institution: The Formal School

The formal school's role in skill formation was incidental in the first stage of the industrial revolution in England and in many other developed countries. Historically, the third category of suppliers of education for skill formation became a major one only relatively recently. But it soon acquired a more or less homomorphic structures all over the world, with only minor differences on account of the diverse needs and situations in different countries.

The education supplied by the non-profit institutions could now be broadly divided into two types; that provided through a degree hierarchy, and that provided through what may be called professional certification of the other kind.

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8 The non-profit schools would include the many private schools, colleges and even universities not owned by the state. For example, the so-called "public schools" in India and the private colleges and universities in the American system of education (see Jenny, 1968) belong to this category of schools. Although these schools could and do aim at earning some sort of profit, their declared objective in supplying education is not to syphon it off for private purposes as in the case of a profit-maximizing firm. These schools too would, therefore, make the non-profit making supplier of education and training. Historically also, formal schooling in fact first developed under private initiative and control; state intervention came much later.

9 The homomorphy or similarity of the hierarchy of structures of formal schooling between countries can be perceived in our description of the different school systems in Chapter 6 and Appendix.
In the first type of education would be higher general education as provided by colleges and universities, and specialized technical and professional training that is supplied by the colleges affiliated to universities as well as by autonomous institutions. Education and training in these non-profit schools are supplied through time-bound structured courses of study.

In the second type, short duration training is supplied by universities usually for medium categories of skill formation, e.g. to train secondary and primary-grade school teachers. Colleges and universities providing courses leading to B.Ed., M.Ed., etc. degrees belong to this group of non-profit schools. Apart from regular colleges and universities, certification for certain medium and lower categories of technical and vocational skills are also provided by non-profit technical school, like government polytechnics, technical institutes, etc.

Here, we have briefly described the three institutional agents supplying education for skill formation. In a later treatment which follows in Chapters 3 and 4, we shall try to analyse the different modes of their operation in determining the quantity of skill formation, the individual's demand for acquiring the skills being given.

2.4 THE EDUCATION MARKET: DEMAND

Education is demanded by the individuals seeking to buy education for themselves or for their children in the education market. As mentioned earlier, this demand is,
however, not isolated from the rest of the economy in the sense that both labour and commodity markets determine the relevance and need for the education that an individual demands. Before we undertake to explain the shapes of the individual as well as the aggregate demand for education it is also necessary, therefore, to understand why individuals demand education. In other words, we shall try to specify the objective behind the demand for education.

In economic theory, the individual is recognised primarily as a consumer and his rationality is defined by his desire to maximize the utility he gets from the consumption of goods and services. As a counterpart to this, the producer's rationality is attributed to the firm and is identified with its objective to maximize the profit it could acquire from the production and sale of commodities. This consumption-production dichotomy sometimes stands in the way of getting a correct interpretation of the individual's objective behind his demand for education and training.

Although it has been basically accepted that the individual's educational activity can be seen as his investment activity which rests on expected rates of return, sometimes it has been suggested that education is demanded alternatively, for deriving consumer satisfaction. But this is not to say that the latter is necessarily, immediate subjective satisfaction from the act of education or learning itself. We would like to emphasize that even if education and training is demanded for consumption benefits, these may
involve investment of a kind — in increasing "consumption skills". The objective behind the individual's demand for education and training thus may be stated as one of raising his future productivity in production and future skill in consumption.

Skills acquired through education enhances the productivity of any given individual worker and gets reflected in higher income that he earns. This in turn leads to an increase in the consumption bundle available to the individual, giving him a higher total of utility. Interpreted in these terms the individual demand for education and skill formation is the reflection of the individual's objective of income maximization.

Apart from the first objective behind the individual demand for education which is to raise his productivity there is a second objective achieved through a rise in the efficiency of consumption. It is true that such effect takes place in terms of greater perception of life, enhancement in the subjective utility derived from the awareness that education creates, as well as in terms of the conditions of work itself. However, regarding skill formation, the usual case, even in highly affluent societies, is that the first effect of skill formation dominates over the second effect. As a result, income maximization becomes the dominant

10 See Freeman (1971), chapter 1, section 1.2.
11 See Majumdar (1976).
objective behind individual's act of investment in skill formation.

The second effect could be the decisive factor only in some isolated and marginal cases of particular individuals and in particular lines of professions. Such professions may, for example, belong to the fields of creative arts. But with modernization and the growth of the urban economy, even the demand for these types of training is also influenced by the price variable in the market. People engaged in the serious pursuit of knowledge, therefore, could not be simply identified as those demanding education for its own sake. A large majority of individuals engaged in such pursuits demand more education and training not because they have a subjective preference for learning but because education helps them enhance their productivity. The crux of the argument lies in that the objective of increasing the monetary earnings or returns from an acquired skill may rest in the very nature of the 'rational' man. This hypothesis, obviously, does not go unchallenged. For example wide wage variations existing in all economies also lend credence to the counter-hypothesis that money-income maximization (which should lead to wage equalisation for equally endowed people) may not have been the only objective behind the individuals' demand for education and training. Having conceded this, we shall now turn to the shape of the demand function for education - based on a broad assumption of the individual rationality of 'investing' in skill formation.
The Individual Demand Function for Education

Before we say anything about the aggregate demand for education we have to understand the shape of the individual demand function itself. We may start by stating a simple but important proposition to the effect that it is almost impossible to conceive of the individual demand for education in purely Marshallian terms.

The downward sloping ordinary demand curve based on the principle of diminishing marginal utility implies that more of a commodity is demanded by the individual when the price falls and less when the price rises. The structural characteristics of education usually do not allow this when the commodity in question is training for any particular level of skill formation. Excepting for some special categories of education, for example, research or, say, coaching provided by a "teaching-shop", the individual cannot exercise his option for demanding either more or less on a continuum. The structure of education, by and large only provides an individual with the choice of either acquiring a quantum of education or not at all. Given a price, each individual seeking to buy education demands his quantum as determined by the requirements of skill formation, which will give him a specific qualification. As contrasted to the ordinary demand which implies that an individual demands less at higher prices and more at lower prices, in education an individual would demand a given quantum of education at a price and at all
prices below it, but none at all if the price rises above that critical level. The individual demand curve for education would, therefore, look like the one shown in Figure 1.

When price is OP, the individual does not demand the education in question. It is only when the price falls to OP the individual demands the fixed quantum of that education, so that demand becomes OA, OA here representing one indivisible unit of education. Considering that the initial price was OP, which falls subsequently to OP, the demand curve of the individual would be DA. Strictly speaking, in the Marshallian sense, we may not even call this a demand curve.
The Aggregate Demand Function

Coming to the aggregate demand for education, the demand curve would be similar to the individual demand curve shown in figure 1, only if society is made up of groups of individuals more or less homogeneous in terms of either their incomes or preferences. The only difference would be that the unit of measurement on the horizontal axis would change and the distance OA (in figure 1) would now represent the product of the total number of individuals N demanding the education in question and the unit or quantum of education q. When there is no ambiguity, we shall take the quantum q as the unit of measurement so that the number of persons N can itself represent the aggregate demand (for N places).

However, we might still get a Marshall-type aggregate demand function falling to the right if the following standard case of the normal commodity market could be ensured: As price (say, tuition) falls, more and more individuals each demand the given quantum of education.

Now this could be easily conceived of in a society comprising a heterogeneous group of individuals. If individuals belong to diverse income groups or show diverse patterns of preference orderings over various lines of activity, then the number of people demanding education at a price p should increase as the price falls, the function N(p) decreasing in p. Plotting the vectors of prices p and demand N(p), q, q being the quantum of education demanded by
At each person on any N, we shall get a downward sloping aggregate demand for education as shown in figure 12. At price OP, the demand for education N(p) would be OA.

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\text{Demand } D = \text{Number of individuals demanding education } N(p) \text{ times the quantum } q
\]

Figure 2.

At price OP, none would demand education whereas at price 0, the maximum number of individuals that would demand education would demand OA.

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12 We have assumed the demand function here and in the rest of the analysis to be linear or broken in linear segments for the sake of convenience. The same analysis is, however, applicable to non-linear functions of the usual form in any case.

It may be generally concluded that a rightward falling aggregate demand function for education would exist even without the presupposition of Marshallian demand function of the individual, often found "fairly representative of the general demand of a whole market." See Marshall (1920, p. 82).
To show how diversity of incomes or preferences would
determine the negative slope of the aggregate demand function
for education, let us assume the following: The demand for
the education necessary for manual and other relatively lower
categories of skills comes generally from the individuals in
lower income groups, and the demand for the education
necessary for higher categories of skills comes from those in
relatively higher income groups. Let us further assume that
while some minimum level of training would be necessary for
every line of activity open to a person belonging to the
lower income groups, that need not be so for a person in
the higher income group. The latter may be assumed to be
going into a higher skill category only if it is reasonably
attractive in terms of his alternatives among of which at
least, may need no special higher training. Given these
assumptions, it would be the diversity in the range of lower
incomes on the one hand and the diversity in relative
attractiveness of the higher category skill vis-a-vis other
alternative lines of activity within higher income group on
the other that would determine the actual shape of the
aggregate demand function for the concerned education.

If we assume that there is diversity of incomes
within the lower income group itself, and also that access
to loans in the capital market is easier for the relatively
affluent even in this group then at a given price of education
some would be able to afford that education while others would
not. When price falls some of those who could not afford
the initial price would flock in to demand the education because they would now be able to buy it even with their relatively small income. The greater the diversity of incomes the higher would be the degree of such response to given price changes. At zero price all the individuals in the lower income group would rush in to demand education. The aggregate demand in such situation would be elastic so that the curve would look considerably flat. However, if incomes are perfectly homogenous then the demand would be perfectly inelastic and the aggregate demand function would look like the individual demand function. At a given price and below it all individuals would buy the education and above that critical price all will be priced-out of the education market simultaneously.

In the higher category of skills on the other hand demand of the individuals would not be guided by incomes but by individual preferences over the education and other lines of activity based on their relative attractiveness. Income would not be the constraint mainly because individuals demanding such education belong primarily to higher income groups. The shape of the aggregate demand function would then depend upon the number of available alternatives which do not require special education and their relative-cost attractiveness vis-a-vis the higher category of skilled occupations. If there are large numbers of alternatives and they are all placed closely (continuously) enough in the preference-rankings of the individuals then a slight reduction
in the price of the education would make it attractive for a large number of those who initially had marginally preferred other lines. As the price of education falls they would rush in large numbers to buy that education and the aggregate demand function would tend to be flat and elastic. Contrarily, if there are not many other alternative options near the margin then a slight variation in the price of education would not alter its relative cost-attractiveness to a large number of individuals. A small change in the price would then cause no significant variation in the aggregate demand for education so that the demand function would tend to be steeper and inelastic. In an extreme case, it would be perfectly inelastic and look like the individual demand function when the preference orderings of all the individuals in the higher income group are homogenous.

However, if the assumption that none other than the individuals in the higher income groups would demand the education necessary in higher category of skills is relaxed, then the aggregate demand function could become downward sloping even in this extreme case. This could be so because a fall in the price of the education would then attract those in the lower income group who could afford this new lower price and hence aggregate demand would increase substantially at lower and lower prices. But apart from this extreme case, a downward sloping aggregate demand function for education would necessitate a minimum level of diversity in incomes or preferences. The degree of diversity would
determine how elastic or inelastic the demand function would be.

There is another aspect of the aggregate demand function which might differ in the cases of higher and lower categories of skills. As stated earlier, in the case of the lower category of skills the demand OA in figure 2 should correspond to the product of the quantum of education q per person and the total number of individuals in the lower income groups who will all demand education at zero price. As different from this, in the case of higher category of skills the aggregate demand OA need not necessarily be that of all the individuals in the higher income group. This distinction could be described by stating that whereas in the case of the lower category of skills the number of concerned people would represent the total number of individuals in the lower income group, in the case of the higher category skills that number need not include all those in the higher income group. Such a distinction arises due to the fact that since the individuals in the lower income group may not have such scope of pursuing such alternative lines as do not require some education, all of them would necessarily demand education when the price falls to zero. At higher and higher prices, an increasing number of individuals on the margin are priced out because of their inability to afford that price. Contrary to this, however, individuals in the higher income group may have lines open to them which do not
require acquiring of higher skills. Given their preferences, therefore, education for acquiring these skills may not be attractive to some even at zero price. Such being the case, the demand OA in figure 2 would not correspond to a number which comprised all the individuals in the higher income group. Here too, however, if the assumption of only higher income group individuals demanding education for higher category skills is relaxed and people from the lower income group can also come in, then at zero price all the individuals from the latter even if not all from the former group, would account for the aggregate demand OA.

2.9 RESPONSE OF THE AGGREGATE DEMAND FOR EDUCATION TO SIGNALS FROM THE LABOUR MARKET

We have already made the point that the demand for education and training in an economy is essentially a derived demand ultimately from the commodity market and immediately from the labour market. Here, we shall try to analyse how the demand function for education would respond to signals in the labour market - for example, when there is an improvement in the prospects for a particular type of skilled personnel as seen from an increase in the demand for them.

Let a state of demand \( D^1 \) for a particular skill be specified for situation 1 in the labour market. Let \( S^1 \) be defined as the set of concerned people in situation 1 who would all demand education at prices they can afford. We assume the following about the participation of the concerned people in education.
A-3.1. The number of people demanding education is the whole set of concerned people $S^1$ then price $p = 0$, and 0 at some critical price and above. The critical price is OP in figures 5-6 below.

We have also assumed the following:

A-2. The aggregate demand for education $D_E$ is a function of $N$ the number of people participating in education such that $D_E = f(N)$, $f(0)=0$, and $f$ is linear and increasing in $N$.

Now, we shall introduce a number of alternative assumptions: A-3.1 = A-3.4 about how a change in $f(N)$ is brought about by a change in the demand for skilled personnel in the labour market from, say $D^1$ to $D^2$.

A-3.3. If the situation 1 changes to situation 2 due to an increase in the demand from $D^1$ to $D^2$ for a particular skill in the labour market, the set of concerned people in the education market remains the same so that $S^1 = S^2 = S^0$ (say). However, the cut-out price of education at which each individual stops participating goes up in situation 2 such that, as shown in figure 5 below, the demand curve becomes steeper, having undergone a rotation about $A_s$ and changes from $PA$ to $P^1A$. The aggregate demand at $p = 0$ is $OA$ which, of course, remains the same in both situations.
This assumption may be appropriate for the case of demand for education for skills in the lower categories mentioned earlier. The actual shape of the new demand could, however, be like the bowed P'A rather than the dashed line.

We may have, as an alternative to A-3.1 the following:

A-3.2: If the situation changes due to an increase in the demand for skill concerned from $D_1$ to $D_2$, the set of concerned people increases from $S_1$ to $S_2$. However, the cut-out prices of the originally concerned individuals remain the same.

The implication of A-3.2 is that in the new situation an additional fixed number $x$ of people become participants at all the relevant prices down to $p = 0$ so that, in the
simplest case, demand shifts to the right by an amount \( f(x) \). Thus the demand curve \( PA \) in figure 4 shifts parallel to itself by a distance \( f(x) = AA' \). It may be, however, that the cut-out price of the newly concerned set of people is actually higher than \( OP \). In that case the \( PP' \) segment will be above what is shown in figure 4 (see figures 5 and 6 ... Chapter 4).

![Figure 4](image)

\( A-3.2 \) may be appropriate for situations in which education relevant for the higher categories of skill formation can be presumed to be demanded on the basis not of an income constraint but of alternative profitable avenues open to the individuals. When the prospects of the skill concerned increase marginally in the labour market it is possible that the original set of individuals would not alter their cut-out
price, but some individuals who were in the marginally preferred occupations which did not need the education might now choose to switch over and participate. In the new situation, therefore, if the newly concerned people are all prepared to pay the price OP, the aggregate demand for education would increase by that corresponding number at all price levels, and the new aggregate demand curve $P'A'$ would lie parallel to the original.

**A-3.3** If the situation in the education market changes due to an increase in demand from $D^1$ to $D^2$ in the labour market, the cost of concerned people will increase, say, from $S^1$ to $S^2$. While the cut-out prices for the originally concerned individuals are allowed to go up the newly concerned individuals are assumed to participate at all the relevant prices.

The implication of A-3.3 is that in the new situation, not only would there be an addition of a fixed number $x$ of people participating at all the relevant prices down to $p = 0$, but also the demand of the original set $S^4$ of concerned people would be steeper ($P'A$ in figure 5). Therefore, the new aggregate demand would shift to the right by an amount $f(x)$ at $p = 0$, but more than $f(x)$ at $p > 0$ such that the curve $P'PA'$ (derived through aggregation of $P'A$ and $f(x)$) becomes steeper than PA (in figure 5).
A-3.3 could be appropriate for situations in which heterogeneous groups of individuals participate in education. If people in the original set were the ones (rather than the new entrants) who were mainly constrained by the consideration of the cost of education then it is likely that those who thought they could not afford to buy education at a given price may in the new situation be attracted by the better prospects. They may raise their respective cut-out prices, say, by dissaving or raising a costlier loan in the capital market. The newly concerned set of people could, on the other hand, all belong to a homogenous higher income group who did not (significantly) respond to changes in the cost of education in the relevant range, but did respond to changes in the prospects or status of persons possessing the particular skill.
A-3.4: As the situation changes due to an increase in the demand from $D^1$ to $D^2$ in the labour market, the set of concerned people in the education market increases from $S^1$ to $S^2$. The cut-out prices go up for all. Moreover, the number of people newly participating in education out of the newly concerned people, say $x$ is $x$ when $p = 0$ but less than $x$ at $p > 0$.

The implication of A-3.4, which describes the general case, is that depending upon the relative behaviour of participation of the two groups of people in the new set — the originally concerned and the newly concerned — the new aggregate demand curve $P' A'$ in figures 6(a), (b), and (c) lying to the right of the old $PA$ can
be either parallel to, or steeper or flatter than the latter.

Since most societies consist of heterogeneous groups of people which are also diverse within themselves in the sense of each group comprising individuals ranging from high to low categories of income-holders, it is more likely that both the original set as well as the newly concerned individuals would, more or less, be responsive both to the cost of education and to 'prospects' including status etc. associated with the skill concerned. The relative strengths of their responses as reflected in their participation behaviour would no doubt determine whether the aggregate demand function for education would shift either parallel to the original function or become steeper or flatter in response to signals in the labour market.

2.6 INCOME GROUPS AND THE COMPOSITION OF THE AGGREGATE DEMAND

Although it is well established that the aggregate demand for education always rises when the prospects for the skill concerned improves in the labour market, the aggregate demand of any particular income group may decline when strong but conflicting group interests are involved.

A fall in one's demand for education when the prospects are higher for any particular skill category is likely to be associated with a change in the relative strengths of the higher and lower income groups in the market. Then the higher income group begins to compete for the same category of jobs in the labour market and demand the same education
that the lower income group does due perhaps to a general
decline in alternative prospects or a rise in the prospects
at hand, both market and non-market forces might operate to
depress the actual demand of the lower income group. Given
the imperfection in the capital market, individuals in the
lower income group might find it both costlier and more
difficult to acquire loans for financing their education.
They might not have enough collateral to offer and hence might
face a relatively worse situation vis-a-vis the individuals
from the richer sections of society. Alternatively, or even
to complement this, the greater influence of the higher
income groups in society might turn the table against the
lower income groups by, say, making admission requirements
stricter and even discriminatory. In some cases, even the
subsidies offered to the worker sections of students might
be withdrawn or decreased. In such circumstances, the
characteristic composition of the aggregate demand for
education might alter.

In some extreme cases the change in the composition
of aggregate demand could even be just in the opposite
direction. A rise in prospects in the labour market some-
times attracts individuals to demand education in over-
whelmingly large numbers. With such an inflow of lower-

15 An instance of "self-regulation" of a profession through
changing admission rules or requirements is provided in
the case of the medical profession in the U.S.A. discussed
in Shaked and Sulton (1960) who also give an interesting
theoretical formulation of the phenomenon.
income people the status rating of the occupations concerned may get threatened to the point that the higher income group begins to withdraw from a skill category. However, rare such cases are, they could still be observed on the fringe of the relatively less developed and feudal societies. It hardly needs commenting that the impact of such change on the aggregate demand for education in the overall education market would nevertheless be only marginal.

15 See Stuart (1975).