In the previous chapters we have seen that age-earnings profiles give an estimate of annual income differential associated with different types and levels of education. A cost-benefit analysis requires these income-differentials to be combined into a single figure representing total monetary benefits derived from a particular level of education, so that this can be compared with the costs of incurring the concerned level of education. The costs of an investment must be incurred in the present in order to obtain income in future and the expectation of receiving money in future is worth less in the present than a similar amount received at present. A sum of money can be invested at a positive rate of interest - the rate of increase will depend on the rate of interest at which it is invested. The cost-benefit analysis involves the discounting of future flows of income, since the purpose of calculation is to compare the present value of expected future benefits with the present value of costs of the concerned level of education if the costs of education are spread over a period of years. The calculation of the rates of return consist of three steps:
(1) Calculation of a net return stream which is nothing but bringing returns and costs together into a single stream of age-specific net returns.

(2) The calculation of present value of these streams.

(3) The discovery of the discount rate at which the present value of net return is zero.

The formula (already mentioned in Chapter 2) for calculating the internal rate of return for a particular type or level of education is

$$\sum_{t=s}^{n} \frac{(B_t - C_t)}{(1+r^*)^t} = 0,$$

where $B$ represents benefits, $C$ the costs of education, $t$ the time period ranging from $s$ (the age at which the concerned level of education commences) to $n$ (the age of retirement), $(n-s)$ being the working life of the individual including schooling years and $r^*$ is the internal rate of return.

In Chapters 5, 6 and 7, we have calculated costs, benefits of different types and levels of education in order to find out the rates of return to different types/levels of higher education in West Bengal.

This chapter has been divided into three sub-sections:

(1) Unadjusted private and social rates of return,

(2) Adjusted private and social rates of return,

(3) Interpretation of the result derived from rates of return.
8.1 Unadjusted Rates of Return

On the basis of the costs and earnings differentials worked out in Chapter 5 and Chapter 6 we have calculated a stream of age-specific net return for each level and type of education. The net earnings streams have two dimensions - positive and negative. The negative stream relates to the period of receiving education and the positive stream relates to the working life of the individual. After the calculation of net earnings stream the internal rate of return is calculated with the help of the above-mentioned formula.

The unadjusted rates of return have been estimated on the following assumptions:

(i) All persons who go through the educational system are employed.

(ii) There is no wastage in education.

(iii) The secular long-term growth of income is negligible.

(iv) The whole of the earnings differentials between two levels of education can be attributed to extra education alone and factors like ability, family background, family connection etc. have no influence on earnings.

(v) All educated persons participate in labour force.
(vi) People live up to the end of their average working period.

Such assumptions are made due to non-availability of the necessary data.

Tables in Appendix 1 present the pre-tax net earnings streams (Table 8.1-A) and post-tax net earnings streams (Table 8.2-A) of different types and levels of education. The pre-tax net earnings differentials between two successive levels of education and the resource costs of the concerned level of education are taken into consideration at the time of estimating social rates of return. The post-tax net earnings differentials between two levels of education and private costs of the concerned level of education are necessary for calculation of private rates of return.

The pre-tax net earnings streams of undergraduates over madhyamik passed fellows and the pre-tax net earnings streams of general graduates over undergraduates are presented in figures 8.1 and 8.2 respectively. In the diagrams the age (in years) is presented along the horizontal axis, the income-differential per annum is measured along the vertical axis and the cost incurred at the time of attaining the particular level of education is shown as negative income.

Table 8.1 depicts the unadjusted or crude rates of return to different types and levels of education. These rates of return are also presented diagrammatically. Composite bar diagrams have been used in order to show the unadjusted social rates of return and private rates of return side by side in Figure 8.3 and Figure 8.4.
Unadjusted Social Net Income Stream ($\text{PRE-TAX}$)
Undergraduates Over Madhyamik
West Bengal 1992-93

Income Differential p.a. (Rs.'000)

Age in Years

Figure 8.1

- Income Differential
Unadjusted Social Net Income Stream (PRE-TAX)
Pass Graduates Over Undergraduates
West Bengal 1992-93

Figure 8.2

Income Differential p.a. (Rs '000)

Age in Years

-30 -20 -10 0 10 20 30 40 50 60 70

-30 -20 -10 0 10 20 30 40 50 60 70

Figure 8.2

Income Differential
Table 8.1
Unadjusted Social and Private Rates of Return: By Higher Educational Type and Level, West Bengal (1992-93)
(Rates of return in percent)

<table>
<thead>
<tr>
<th>Type/Level of Education</th>
<th>Social rate of return(%)</th>
<th>Private rate of return(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General Under-graduates over Matriculates/Madhyamik</td>
<td>14.5</td>
<td>15.7</td>
</tr>
<tr>
<td>2. Professional Under-graduates over Matriculates/Madhyamik</td>
<td>12.4</td>
<td>21.06</td>
</tr>
<tr>
<td>3. General Pass graduates over general Under-graduates</td>
<td>18.3</td>
<td>22.4</td>
</tr>
<tr>
<td>4. Engineering graduates over general Under-graduates</td>
<td>13.2</td>
<td>24.4</td>
</tr>
<tr>
<td>5. Medical graduates over general Under-graduates:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Only salary income of Medical graduates over general Under-graduates is considered</td>
<td>6.7</td>
<td>16.3</td>
</tr>
<tr>
<td>(b) Salary + non-salary income of Medical graduates over general Under-graduates is considered</td>
<td>16.3</td>
<td>28.1</td>
</tr>
<tr>
<td>6. Engineering graduates over engineering diploma-holders</td>
<td>13.7</td>
<td>20.5</td>
</tr>
<tr>
<td>7. General honours graduates over general pass graduates</td>
<td>3.6</td>
<td>4.6</td>
</tr>
<tr>
<td>8. General Post-graduates over general pass graduates</td>
<td>8.9</td>
<td>13.3</td>
</tr>
<tr>
<td>9. General Post-graduates over general honours graduates</td>
<td>7.5</td>
<td>11.1</td>
</tr>
<tr>
<td>10. Engineering Post-graduates over engineering graduates</td>
<td>2.7</td>
<td>4.8</td>
</tr>
<tr>
<td>11. Medical Post-graduates over Medical graduates:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Only salary income of doctors is considered</td>
<td>1.49</td>
<td>4.8</td>
</tr>
<tr>
<td>(b) Salary + non-salary income of doctors is considered</td>
<td>5.0</td>
<td>9.0</td>
</tr>
<tr>
<td>12. General Ph.D. degree holders over general Post-graduates</td>
<td>7.1</td>
<td>10.2</td>
</tr>
</tbody>
</table>

The diagrams are presented in Figures 8.3 and 8.4.
Unadjusted Rates of Return
Social and Private (Marginal)
West Bengal, 1992-93

Note: 'H.S./S.F.' in the horizontal axis indicates the rate of return of undergraduates over Madhyamik and so on.
Unadjusted Rates of Return
Social and Private (Marginal)
West Bengal, 1992-93

Figure 8.4

Note: "D.C.E./S.F." in the horizontal axis indicates the rate of return of Professional undergraduates over Madhyamik and so on.
8.2 Adjusted Rates of Return

The adjusted rates of return are based on the results of Chapter 7 where the actual effect of education on earnings has been isolated. In order to calculate the adjusted social and private rates of return the net earnings streams are shown in Table 8.1 and Table 8.2 in the Appendix-1. These tables are based on adjusted pre-tax and post-tax age-earnings profiles (Table 7.3 and Table 7.4) of different types/levels of higher education in West Bengal. The procedure followed is the same as in case of the unadjusted rates of return.

All earnings of the individual cannot be attributed to education. A substantial part of individual earnings may be due to several other factors. We have assumed that the earnings or income of persons of any particular qualification (educational) group is a function of age, sex, origin, nature of service and sector of work.

\[ y \text{ (Annual Income)} = f (\text{Age, Sex, Origin, Nature of Service, Sector of Work}) + e, \]

where "e" is the 'error' term.

Assuming linearity of the effects we have adjusted for other variables, viz., 'age', 'sex', 'origin', 'nature of service' and 'sector of work' to fit earnings function through regression analysis. The adjusted rates of return
have been calculated for eight types and levels of education as against eleven types of education in case of unadjusted rates of return. Due to small sample size of some educational qualification group we have not prepared adjusted age-earnings profiles of those groups as they may give unreliable result.

At the time of calculating adjusted rates of return we have not adjusted for:

(1) Wastage and stagnation in education as there are only six cases of drop-outs in our sample survey of 305 cases.
(2) Mortality rate.
(3) Labour force non-participation rate and
(4) Effect of unemployment in the benefit side. But we have adjusted income for average waiting period for getting employment after completion of education in the benefit side.

We have adjusted for long-term secular growth of income in our adjusted rate of return.

According to Blaug et.al. 1 (1969 : 214) the usual procedure for adjustment for the effect of unemployment is

to multiply the age-earnings profiles of the particular level of education by the proportion of the employed persons in relation to the number of persons who have successfully completed that level of education. It has not been possible for us to get adequate information about the probability of persons being employed at particular age-group having particular level of education. Psacharopoulos is of opinion that unemployment is highest among the young and it lasts for few years\(^2\). So it can be termed as employment searching period. So it will be unfair to deflate the whole age-education-earnings profiles by the rate of unemployment. At the time of our survey we have collected information about the waiting period for getting the job. Since we have collected data from employed persons the average waiting period is not so long. We have seen that it varies from 2 months to 1\(\frac{1}{2}\) years (Table 5.8 in Chapter 5). In our adjusted age-earnings profiles we have adjusted for average waiting period in the income-side by deflating the age-earnings profiles. We have adjusted for rate of unemployment in the cost-side at the time of calculating foregone earnings of different types and levels of education.

The adjustment for non-participation rate in labour force has not been made as we have collected data on

earnings of employed persons irrespective of sex. Non-participation rate in the labour force is generally high among the educated female population.

It has not been possible for us to make adjustment for mortality rate in our adjusted age-earnings profiles due to lack of age-specific, education-specific mortality rates of the earning people.

In order to estimate rates of return to education we are in need of data on life-time earnings of individuals by age and educational level. But time-series data on age-education-earnings profile are hardly available even in advanced countries. Almost all studies on return to education are, therefore, based on cross-sectional data collected through national/regional census or sample surveys. The cross-section age-earnings profiles do not truly represent the life-time earnings profiles. The life-time earnings profiles are obtained by inflating the cross-section data by the rate of growth of individual incomes. In order to allow for secular growth in incomes we have to add the expected long-term rate of growth of education specific earnings per worker to the adjusted rates of return.

The adjusted rates of return to different types and levels of education are presented in Table 8.2. Taking
Table 8.2
Adjusted Internal Rates of Return by Higher Educational Type and Level, West Bengal (1992-93)
(Rates of Return in percent)

<table>
<thead>
<tr>
<th>Type/level of Education</th>
<th>Social Rate of Return (Before growth adjustment)</th>
<th>Social Rate of Return (After growth adjustment)</th>
<th>Private Rate of Return (Before growth adjustment)</th>
<th>PRR (After growth adjustment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General graduates over general Undergraduates</td>
<td>10.2</td>
<td>12.3</td>
<td>12.1</td>
<td>14.2</td>
</tr>
<tr>
<td>2. Engineering graduates over general Undergraduates</td>
<td>6.2</td>
<td>8.3</td>
<td>9.7</td>
<td>11.8</td>
</tr>
<tr>
<td>3. M.B.B.S. over general Undergraduates: (a) Only salary income is considered</td>
<td>4.7</td>
<td>6.8</td>
<td>9.6</td>
<td>11.7</td>
</tr>
<tr>
<td>(b) Actual income of doctors (i.e. salary + non-salary) is considered</td>
<td>13.0</td>
<td>15.1</td>
<td>23.04</td>
<td>25.14</td>
</tr>
<tr>
<td>4. General Post-graduates over general pass graduates</td>
<td>5.6</td>
<td>7.7</td>
<td>9.1</td>
<td>11.2</td>
</tr>
<tr>
<td>5. General Ph.D. degree holders over general Post-graduates</td>
<td>1.27</td>
<td>3.4</td>
<td>1.87</td>
<td>4.0</td>
</tr>
<tr>
<td>6. Medical Post-graduates over medical graduates: (a) Only salary income is considered</td>
<td>-5.3</td>
<td>-3.2</td>
<td>2.9</td>
<td>5.0</td>
</tr>
<tr>
<td>(b) Actual income of doctors (salary + non-salary) is considered</td>
<td>4.0</td>
<td>6.1</td>
<td>13.9</td>
<td>16.0</td>
</tr>
<tr>
<td>7. Engineering Post-graduates over Engineering graduates</td>
<td>8.4</td>
<td>10.5</td>
<td>13.5</td>
<td>15.6</td>
</tr>
</tbody>
</table>
into consideration the per capita growth rate of income in India during the plan period we have assumed 2.1% annual growth rate as the secular long-term growth rate in per capita income. So growth adjustment in social and private rates of return have been made by adding 2.1% with the calculated rates of return.

The Table 8.2 presents the adjusted social and private rates of return to higher education in West Bengal.

8.3 Interpretation of the Results

A glance at the rates of return estimate of sections 8.1 & 8.2 will reveal three main features of the rates of return analysis of higher education in West Bengal.

(1) Private rates of return are higher than the social rates of return to all types/levels of education.

(2) Rates of return generally decline as one moves from the lower level of higher education to the higher level of higher education with the exception in the field of 'Medical graduate level' and 'Engineering graduate level' of education. The general under-graduate level of education is also an exception.

(3) The social rates of return to professional education are lower than the social rates of return to general education.
Let us now explain the causes that lie behind the above-mentioned features.

8.3.1 **Private rates of return are higher than social rates of return**

The private rates of return on educational investment is an important piece of evidence in explaining the demand of individuals for additional education. From our calculation of rates of return in Table 8.1 and Table 8.2 it is established that private rates of return are higher than social rates of return. For calculating private rates of return post-tax earnings differentials between two successive levels of education and the private costs including foregone earnings of the concerned level are taken into account. But for calculating social rates of return it is necessary to consider pre-tax earnings differentials between two successive levels of education and resource costs of the concerned level of education. In West Bengal higher education is highly subsidised and so the public costs of education are high. Resource costs of education consist of private costs, public costs and foregone earnings. Resource costs of education are disproportionately higher than the private costs. So the social rates of return are lower than the private rates of return.
It must be remembered that rates of return measure the direct benefits of education ignoring the indirect benefits of education, the spillovers of education which cause the marginal social product of labour to exceed its marginal private product. So social rates of return on investment in education may be underestimated. This argument is not applicable to private rates of return as indirect benefits cannot be appropriated by the particular individual. If it is possible for us to quantify the indirect benefits and spillovers of education and include them in the benefit-side at the time of calculation of rates of return then social rates of return may be expected to be greater than private rates of return.

8.3.2 Lower rates of return to higher level of education

The private and social rates of return generally decline monotonically indicating something like diminishing returns to increments in the years of schooling. In West Bengal exception to this general feature is found in the field of Medical education, Engineering education and general under-graduate level of education.

The causes of lower rates of return to higher level of education are given below.

(1) The working span of highly educated persons is less
as they enter into service at later ages than their less-educated counterparts.

(2) As one moves higher up the educational ladder the costs of education gradually increase. But the general pay-scales of these fellows are not high enough to offset the effect of high cost of education.

(3) The highly educated persons generally begin their working life at higher wages than the less-educated fellows. The higher the income one earns the higher is the amount of income-tax and profession-tax. The general under-graduates, professional under-graduates and general graduates do not come under "Income-tax-paying category" at the beginning of their working life. They pay income-tax only at later ages. So the income differentials at lower level of higher education are high and given the low costs of education the rates of return are high. There are some exceptions to this general rule as we have already mentioned. (a) The Table 8.1 reveals that the rates of return to general under-graduate level over Madhyamik are lower than the rates of return to general graduates over general under-graduates. The causes of the low rates of return to general under-graduates are stated below:
(i) The Higher Secondary stage is the stepping stone of moving higher up the educational ladder. So the students want to perform well at this stage so that they can move up the educational ladder according to their choice. It is true that education in West Bengal is free up to Higher Secondary stage. But due to heavy syllabus the students are found to take private coaching from four or five tutors. Although there is no tuition fee at schools (or colleges) the parents have to incur heavy cost for private coaching of their wards. Along with this cost the foregone earnings of the students are added. Public cost of education is also high at this stage as education is free up to this level. So social costs of education as well as private costs of education are high at this stage.

(ii) The pay-scale of general under-graduates are low and the income-differentials of general under-graduates over Madhyamik-passed fellows are not so high as to offset the effect of high cost.

These causes lead to low rates of return (private and social rate of return) to general under-graduate level of education in West Bengal.
(b) From Table 8.1 it is clear that Engineering education and Medical education (graduate level) are also exceptions to this general rule. The private rate of return (unadjusted) to Engineering graduates over general under-graduates is higher than that of general under-graduates over Matriculates (Madhyamik-passed fellows). This can be explained by the fact that the post-tax income differentials between Engineering graduates and general under-graduates are large enough to offset the effect of higher private cost of education (including foregone earnings) in the Engineering faculty.

Moreover, the unadjusted social and private rates of return to Engineering graduates over general under-graduates are higher than those of Professional under-graduates over Matriculates. This is due to comparatively low pay-scale and high private costs of Professional under-graduates.

(c) The Medical education is the most profitable form of investment yielding the highest rate of return. The private and social rates of return to Medical graduates over general under-graduates are much higher than the rates of return to general under-graduates over Matriculates. The same arguments as in case of Engineering graduates are also applicable to the case of Medical graduates.
8.3.3 Lower social rates of return to professional graduates

Generally the investment in professional higher education is more profitable than investment in general education. This is the case in India as we find from the estimates of V.N. Kothari, Blaug et al., Nallagoundan, Tilak and others. But the rates of return estimated by Husain (1967 and 1969) and H.N. Pandit (1972) for India and Sailabala Debi for Orissa (1980-81) show that the rates of return to professional graduates are lower than those of general graduates. The tables of the estimates of the above-mentioned researchers are presented in the next chapter.

The estimates of the rates of return of West Bengal are similar to the estimates of Husain, H.N. Pandit and S. Debi. The unadjusted social rate of return to professional undergraduates over Matriculates is less than that of general undergraduates over Matriculates. Even Engineering graduates have lower social rates of return (adjusted and unadjusted) than those of general graduates over general undergraduates. This is also the case of Medical graduates if we take into consideration their salary income only. But the picture changes slightly when we take into consideration the actual income of the doctors taking into account their salary and non-salary income together.
Although the unadjusted social rate of return to Medical graduates is less than that of general graduates over general undergraduates the adjusted social as well as private rates of return to Medical graduates are higher than those of general graduates indicating that the effect of education on earnings are more dominant in case of medical graduates.

There are various reasons for low social rates of return to professional undergraduates, professional graduates over the immediate lower level of education.

(1) The social cost of professional undergraduate course and professional graduate course are much higher than the social cost incurred for general undergraduate and general graduate course respectively. The pay-scales of the professional undergraduates and professional graduates are not high enough to offset fully the effect of high cost incurred, which, in turn, lowers their social rates of return.

(2) In 1992-93 there were 312 colleges for general education in West Bengal but the number of polytechnics were 32 and the number of engineering and technology colleges were 10 including Shibpur Engineering college been given which has the status of deemed university in 1992.
So the students have to go out of their home for professional education and incur higher cost compared to the students of general graduate course who can receive education by staying at home.

(3) The gestation period of professional undergraduate course and professional graduate course are longer than the gestation period for general undergraduate course and general graduate course respectively. This leads to the escalation of cost which in turn leads to lower rates of return.

(4) A general graduate starts earning at age 22 whereas an Engineering graduate can come to the labour market at age 24 and Medical graduate at age 25. So the working period of professional graduates is less than the working period of general graduates.

(5) A general graduate comes to the 'Income-tax paying category' only at late ages in his service period. But a professional graduate has to pay income-tax from early ages as their pay-scale is higher.

(6) The proportion of life-time earnings differential to resource costs or social costs of education is higher at each level of general education than those of professional education. This confirms the existence
for higher social rate of return to general education compared to the social rate of return to professional education.

Moreover the graduate engineers and doctors are appointed as junior engineers or junior medical officers at the first stage of their service-life. At this stage their salary structure is slightly higher than that of general graduates. So the heavy cost of professional education is not covered by adequate income which, in turn, lowers their rates of return. Professional graduates enjoy some fringe benefits. But during our survey we could not get any reliable information about the fringe benefits. So we could not include the money value of the fringe benefits in the earnings of professional graduates and it leads to a downward bias in our calculated rate of return.

All these causes are responsible for low social rates of return to professional graduates.

The rates of return estimated by Husain (1967 and 1969) and H.N. Pandit (1972) for India and Sailabala Debi for Orissa (1980-81) are similar to our estimates for West Bengal. In their studies both the social rates of return and private rates of return to professional graduates are less than those to general graduates. In our estimate of the rates of return for West Bengal private rates of return
to professional graduates are higher than those to general graduates.

We are going to present the rates of return tables calculated by different economists and researchers in India in the next chapter so that our calculated rates can be compared with those rates.

8.3.4 Private rates of return higher than alternative rates

Let us now consider the case of private rates of return. An individual assesses rates of return prior to taking a decision to invest his resources in a project. An individual will opt for additional education if private rate of return to additional level of education is higher than the rate of return in alternative lines of investment. Private demand for education will depend on private rate of return. Here the unadjusted return is taken into consideration. Education generates consumption benefits - but it is not included in our rates of return calculation due to the difficulty of quantifying the consumption aspect of education. So our calculated private rates of return have a downward bias. Generally if people have surplus money they prefer to hold it in bank accounts - few invest in bonds and shares. In their case study of India Blaug, Layard and Woodhall (1969) used the interest rate on savings bank deposit as the
alternative rate to compare with private rate of return. Following them we shall compare private rates of return with interest on savings bank deposits. Table 8.3 presents the rates of interest on savings bank deposits as well as on fixed deposits in commercial banks in West Bengal.

Table 8.3
Rate of interest on Commercial Bank deposits in West Bengal before March 1 and before September 2, 1993

<table>
<thead>
<tr>
<th>Type of deposits</th>
<th>Before March 1, 1993</th>
<th>From March 1, 1993 to September 2, 1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Savings bank deposits</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>(ii) Deposits for 6 months</td>
<td>12.75%</td>
<td>10%</td>
</tr>
<tr>
<td>(iii) Deposits for 1 year and upwards</td>
<td>13%</td>
<td>11%</td>
</tr>
</tbody>
</table>

When we compare the unadjusted private rates of return with the alternative rate we find that investment in all types and levels of higher education are more profitable than investment in alternative projects. The most profitable level of education in West Bengal is medical education - the next in hierarchy is the engineering graduate level and then comes the general graduate level and professional undergraduate level of education.
It is found that the unadjusted private rates of return to almost all types and levels of higher education in West Bengal are higher than the alternative rates even if the interest rate on fixed deposits are considered as the alternative rate with the exception of engineering post-graduate level (M.E. over B.E.) and general honours graduate level over general pass graduate level \( \text{i.e.,} \) B.A./B.Sc./B.Com. (Hons.) over B.A./B.Sc./B.Com. (Pass). Adjusted private rates of return to all types and levels of education are greater than alternative rate of return with the sole exception of general Ph.D. degree holders over general post-graduate level.

Similarly we can compare the social rates of return with alternative rate in order to find out the social profitability of a given type of education. The social alternative rate of return is the rate of return on physical capital.

Different economists have assumed different rates as the alternative rate of return to physical capital in India. Harberger (1972) used the data of machine industries (1955-56 data) and obtained an average rate of return for the group as a whole/varying from 13.26% to 26%. Blaug, Layard and Woodhall (1969) used 12.5% as the alternative rate of return to physical capital in India. World Bank (1978)
estimated 19% as the rate of return to the Fisheries and Telecommunication industries in India. Datta Chaudhuri and Sen (1970) suggested that 20% would be a reasonable estimate for average rate of return on private capital in India.

If we take 20% as an estimate for average rate of return on private capital it is observed from our estimated social rates of return (Table 8.2) that the adjusted social rates of return for all types and levels of higher education are lower than the alternative rate. If we go by unadjusted social rates of return, the alternative rate of return is higher than the estimated rates of return for all types and levels of higher education in West Bengal.

Economists like Nallagoundan (1967), Blaug et. al. (1969), Harberger (1972) and others found that investment in human capital is less profitable than investment in physical capital in India. Our study also shows that investment in physical capital is more profitable than investment in human capital.

8.3.5 General characteristics of rates of return analysis for West Bengal

Let us now examine whether the rates of return in our case study of West Bengal reflect the general features of rates of return to different types/levels of education.
derived from different studies in India and other countries like USA, Canada, Denmark, Kenya, Colombia etc. Blaug (1970) observes that certain broad conclusions emerge from all these studies:

1. Private rates of return are almost always higher than social rates of return reflecting high level of state subsidies to education.

2. Private rates of return are in excess of what individuals can earn from purchase of bonds and share, interest on savings bank deposits etc.

3. Social rates of return on higher education are either roughly the same as the yield of alternative public or private investment or are sometimes clearly below alternative yields (as in India, Israel).

4. Both private and social rates of return on additional levels of education generally decline monotonically.

The rates of return calculated for all types and levels of education in West Bengal show the first feature.

In our study all the adjusted and unadjusted private rates of return are higher than the alternative rate. Thus our calculated rates of return also confirm the second characteristic mentioned above. The social rates of return
to all types/levels of education in our study are less than the alternative rates of return to physical capital. So far as the fourth characteristic is concerned the Table 8.1 shows that the rates of return are declining monotonically as we move from lower levels of education to higher levels with the exception of general graduate level and professional graduate level of education in case of unadjusted rates of return.

In case of adjusted rates of return the fourth characteristic holds good with the exception of engineering post-graduate level and medical graduate and post-graduate level of education (vide table 8.2). It is true that there is educated unemployment in West Bengal. It has worked to reduce the earnings of the educated. But decline in earnings has never been fast enough to eliminate the incentive to acquire more education. Enrolments in higher education in West Bengal are increasing over time even though investment in higher education is less profitable for society.

The high rate of growth in higher education may be due to (i) some prestige value attached to higher education by parents, (ii) despite the high incidence of unemployment even for the better educated, additional education up to degree level still remains a profitable investment for average parents.
Irrespective of the values and social objectives, the role of education is to differentiate and in view of socio-economic considerations, the differentiation is usually in favour of the upper strata of the society. Private demand for education goes up with growth of per capita income provided education yields greater satisfaction in form of higher wages or greater capacity to enjoy culture and leisure. A student belonging to the upper income strata has a generation of learning behind him, an environment of scholarship in his home and neighbourhood and these are the initial advantages of the student. A cross-sectional study conducted by OECD\(^3\) has come to the following conclusions:

(a) Social selection takes place below the University level, especially at the secondary level. It favours the upper and middle classes and thus creates a social difference in eligibility for higher education.

(b) Young people from upper classes are highly over-represented in higher education.

(c) There are wide differences in drop-out rates according to social origin; the rates are higher for the socially handicapped.

In West Bengal also these conclusions hold good. On average it is found that educated person receives higher

wages than an uneducated person and a more educated person receives higher wages as compared to a less educated person\(^4\). It is this circular motion from higher income to education and from education to higher wages which makes education the preserve of the elites.

Bowles (1971) finds that the benefits of higher education tend to go to the elite group and benefits from primary education to the mass; since elites are more vocal than the mass the government is pressurised to subsidise higher education more than primary education.

So some are of opinion that fees should be raised in higher education and more stipends and scholarships should be given so that the meritorious but poor students can get the benefit of higher education.

Educational planners in developing countries are constantly faced with the problem of allocating resources to education and to other sectors and also between different types of education in order to maximise social goals. Cost-benefit analysis does not offer an automatic solution to the problem of resource allocation. It does not

\(^4\) George Psacharopoulos - 'Rates of return to investment in education around the world' - Table 1, Comparative Education Review, Feb. 1972, Vol.16, No.1.
provide numerical target for planners. It provides a direction indicator for investment policy. The planner should invest more in projects whose rate of return significantly exceeds the alternative rate of return. Comparison of rates of return in all cases do no more than provide signal for change but it cannot specify the precise magnitude of change. Since it is a marginal analysis it can never show what will be the effect of a very large scale change in pattern of allocation.

If our purpose is to compare the profitability of different forms of investment the measures of benefit should take into account both external and direct benefits. But nobody has succeeded in quantifying the spillover benefits of schooling. But this problem is less crucial for comparison of rates of return between different levels. Woodhall\(^5\) (1980 : 42-43) observes, "If we believe that all levels of education generate external benefits, it is not too misleading to concentrate on a comparison of direct benefits associated with different types and levels of education".

To sum up, the medical graduate level of education emerges as the most profitable level of higher education in West Bengal from the private viewpoint. Both the unadjusted

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and adjusted private rates of return to medical graduate
level reveal this fact. Next in gradation is the engineering
graduate level and then comes the general graduate level and
professional under-graduate level of education respectively
as revealed by the unadjusted private rates of return. This
is the cause of heavy rush for admission to medical and
engineering colleges. The rates of return gradually decline
as we move to higher levels of higher education. From the
viewpoint of society the graduate level of education emerges
as the most profitable level of education compared to the
unadjusted social rates of return to other types and levels
of education.

The adjusted rates of return to different types and
levels of higher education reveal that M.B.B.S. level of
education is the most profitable level and next in graduation
is the M.S./M.D. level of medical education. Then comes the
engineering post-graduate level and general graduate level
of education respectively from private viewpoint. This
result indicates that education is the most dominant factor
in determining earnings of an individual at the higher level
of higher education. From the viewpoint of society the
adjusted rate of return to M.B.B.S. level is the highest
and next in hierarchy are the engineering post-graduate
level and the general graduate level respectively.
The private rates of return to almost all types and levels of education are greater than the alternative rate of return with the sole exception of adjusted private rate of return to general Ph.D. degree level of education. But social rates of return to all types and levels of higher education are less than the alternative rate of return to physical capital. The cause of low social rates of return lies in our inability to quantify indirect benefits and spillovers of education.