PART I

THEORETICAL ISSUES
EFFICIENCY OF PUBLIC EXPENDITURE ON SOCIAL SERVICES: A CASE STUDY IN COST-BENEFIT ANALYSIS OF GENERAL HIGHER EDUCATION IN KARNATAKA

CHAPTER I

INTRODUCTION

Statement of the Problem:

One must agree with Alfred Marshall for his view that "poverty is the fundamental economic problem and it alone is the chief justification for the study of economics". This problem is always relevant when we study the economic conditions of under-developed countries in comparison with those of developed ones. All such studies must, therefore, indicate measures that help to remove bottle-necks in the path of steady economic growth of these countries which alone is the panacea for the disease of poverty.

The process of economic development in underdeveloped countries requires prima facie a rapid accumulation of capital to increase productivity in all sectors of the economy. In other words, it is a process of transforming traditional economy into a modern industrial economy by acquiring most modern capital equipment and the adequate knowledge to use
This further implies that capital accumulation is a simultaneous process of investment in both physical and human resources for a rapid economic growth. Assuming physical capital as a must for economic development, it is thus evident that the development of skills and knowledge of the people is the sine qua non of economic growth. This means that there is no point in building modern steel mills and chemical manufacturing plants unless the Managers, Scientists, Engineers, Technicians, Office Personnel and Skilled Workers are available to operate them.

All the modern politically independent countries have almost accepted the democratic way of governing the people. The furtherance of this objective has compelled them to declare themselves as "WELFARE STATES". The acceptance of the concept of 'Welfare State' in a developing democratic society calls forth not only balanced economic

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1 This point is developed in Chapter II.
development but along side the balanced social development too. The balanced development in its comprehensive sense implies 'the combination of economic and social factors yielding the greatest sustained increase in total development'. This problem can be resolved by the combination of measures which increase productivity on the one hand and achieve redistributive justice towards equality of income and opportunity on the other. Here comes the role of fiscal policy through government spending.

The expenditure side of the public budget imposes a great responsibility on the financial authority because, there are numerous competing demands upon the painfully limited resources of the country. He has to face a difficult task of striking 'an appropriate balance' in the allocation of total resources among competing ends, all of which may be important to economic development. In this connection it is pointed out that the resources used to increase social and economic overheads solve both the problems of economic development and the social well-being without hampering private initiative and enterprise. A progressive public expenditure designed to increase the efficiency of human material by providing education and
training, housing, and by improving sanitation, health and nutrition increases productivity and accelerates development. Therefore, the role of public expenditure as a measure to reduce inequality to promote social welfare and improve human well-being without sacrificing the basic requirements of economic growth need not be over-emphasized. Economic growth should fundamentally facilitate increase in per capita output so as to permit every man and woman to have a decent standard of living in the society. To achieve this, the interrelationship between efficient production and equitable distributions should be recognised without which the problem of optimum distribution does not become merged with the problems of public investment expenditure.

In this context, the role of human resources in the process of economic development is well recognised by all economic planners and policy makers. A great impediment in the way of rapid economic development of the under-developed countries is the widespread existence of ignorance, illiteracy, lack of training and ill-health on the part of their work force. A poor, ignorant, illiterate and less healthy population can hardly possess adequate motivation - a most potent factor in economic development.
Nevertheless, in the process of economic growth it is customary to attach great importance to the accumulation of physical capital. This tends to underestimate the true value of capital formation. It is now realised that future production is increased not only by net addition to a country's tangible reproducible capital stock but also by non-physical development expenditure on the development of human capital or 'human resource development'. 'Human resources development' is the "process of increasing knowledge, the skills and the capacities of all people of the country". In economic terms it is the accumulation of human capital and its effective investment in the development of the economy.

Human resources can be developed in many ways - through education, self-development, improvement in health and nutrition. Of these, the most obvious is education.

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5 Ibid.
The present study emphasizes on educational expenditure only because, ultimately economic growth depends on the advance of knowledge and the expansion of education among all classes of the community. Empirical studies show that the spread of education is perhaps the most potent single weapon of development. "The major difference between a developed and an underdeveloped country is that the former possesses the proficiency required to take on and use efficiently superior techniques of organisation and production and the latter has not yet acquired the capacity to do so." This points to the necessity not only of education but also for perspective educational planning in the light of targets for economic and social development. Education consequently has become in all countries primarily a public responsibility and 'decisions with respect to the amount and nature of educational expenditures are continuously being taken by public authorities, presumably in terms of some conception of the social goals that are to be served'.


The question of deciding the appropriate levels of expenditure among different kinds of education naturally demands an investment criterion. Quite often, 'social welfare' objective has been employed as the appropriate criterion for public spending on education. But the difficulty in this approach is how to define this term with subjective tone objectively. When government decisions are made collectively by individuals in a democratic and free society, the required unambiguous definition of the term acceptable to all seems impossible. Therefore, to replace this 'subjective' notion by an 'objective' notion of efficiency, rationality in decision-making may be taken as the appropriate criterion. This rationality requires the decision maker to be more fully informed about the alternative courses of action by which the efficiency can be objectively measured. The efficiency criterion alone can be definitely stated in terms of quantifiable and measurable units and can provide basis and improved performance in budgetary allocations. In an attempt to scientific approach to decision-making on public investment in education, some analytical tools of efficiency have been proposed and introduced in economic analysis. Recently efforts have been made to incorporate investment in
education into the main stream of economic analysis. The following are the criteria suggested for deciding investments in education.$^8$

(i) Contribution of education to Gross National Product.

(ii) Financial returns (Economic Benefits) from Education

(iii) Education/Requirement

Economists like T.W. Schultz, E.F. Denson and Hector Correa have made efforts to determine the contribution of education to growth in income. But their conclusions have been questioned on several grounds, mainly in terms of the methods of calculation used in arriving at precise figure for and the coverage of contributions of education. They also fail to serve as a criterion for allocation of resources in so far as they do not help to choose among alternative investments.

$^8$ Discussed in D.M. Nanjundappa in *Investment in Human Resources*, op.cit., P.60.
The second approach directs our attention to the contribution of education to earning capacity. This approach is appropriately termed as 'Rate of Return Criterion' or 'Cost-Benefit Approach'. In this approach the benefits are identified and estimated in relation to the corresponding costs of education from the point of view of optimal allocation. Measuring all the benefits and corresponding costs in money terms is no doubt extremely difficult. However, confining to income-flows and costs that can be reasonably identified, a rate of return is to be estimated by finding that rate of discount which equates the present value of the additional income-flows with the value of the cost outlays. Such a rate of return shall provide a rational guide to educational investment decisions. The realistic assumption behind this approach is that differences in the earnings of individuals, more or less, reflect the differences in educational abilities, arising out of the differences in the investment in their education and training. However in cases where a large part of earning differentials are in the form of rents of inherited ability and/or rent of scarcity, the assumption may not hold good and limit the usefulness and validity.

9 Ibid., P.61.
10 Ibid., P.62.
of the rate of returns approach. Yet, as a first approximation to the measure of productiveness of investment in education, this approach has been adopted successfully by some economists. For example, G.S. Becker, E.F. Reinshaw, T.W. Schultz, H.S. Houthakker, W. Lee Hansen and Jacob Mincer have made detailed studies of returns to education in the United States disclosing the strength and limitations of this tool.

The third approach advocated by Prof. R.S. Eckaus involves estimating current requirements for education as an investment and then extrapolating future requirements. Eckaus claims this approach to be simple and straightforward as it avoids difficult problems as those of estimating shadow prices for resources for which there are no valid market prices; it also overcomes the limitation on the efficiency of educational expenditures arising from unemployment and demand for education for consumption purposes.

11 Ibid., P. 69.
But this approach suggested as an alternative to rate of return criterion concerns more with educational planning than with the allocation of resources. The allocation issue becomes complicated in countries that are confronted with many other competing investment expenditures. A rational allocation of resources demands comparison of benefits from education with those of other forms of expenditures. Moreover the criterion of educational requirement offers no guidance to expenditure on education as an investment on the part of the individuals and also on education for reasons other than developing productive capacity. Therefore, this approach can be a supplement to but not a substitute for the rate of return criterion.\textsuperscript{12}

Cost-Benefit analysis which is adopted successfully in economic analysis normally comprises of several stages.\textsuperscript{13} Those are (i) the projects must be defined with a list of the current benefits and costs to be included; (ii) the list of benefits and costs—direct or indirect, must be reduced to monetary values in order to arrive

\textsuperscript{12} Ibid., P. 70.

at an estimate of the current net benefit of the project;
(iii) the final step is to compare the stream of annual
benefits with the capital cost of the project. But at each
stage, we have to experience many constraints and limita-
tions. In the first stage, it is extremely difficult to
evaluate external benefits and costs. In the second
stage, there is not only a problem of placing monetary
value on collective or other goods or services but also
the problem of 'indivisibility' that they possess
affecting the prevailing market prices over the whole
economy. The third stage is concerned with expressing the
annual value as a percentage rate of return on the invest-
ment after an allowance has been made for depreciation of
capital assets. The problem is then to see whether the
value of capital is at least equal to the price of the
capital as represented by the rate of interest. Herein
lies the difficult task of choosing the appropriate
interest rate which is held to be purely a value judgment.
"Difficulties of this nature are common in Cost-Benefit
analysis and will arise constantly."\textsuperscript{14} But this should

not come in the way of our efforts to incorporate CBA\textsuperscript{15} as a tool of measuring economic efficiency of public spending.

So far the only public spending programme brought rather successfully into the framework of CBA is 'water resource development' in U.S.A.\textsuperscript{16} The possibility is due to the fact that the outputs of the programme (viz. water and power) are marketable in the sense that they bear relevant market prices. The costs of the programme are also easily identifiable. Therefore, efficiency of such a programme can easily be tested by the market criterion i.e. profit which is expressed in terms of the surplus of revenue or income over cost of providing the goods. The allocative efficiency of expenditure on education on the other hand, it is argued, cannot be tested by this market criterion because, the goods of the educational industry are collective in nature and are non-marketable. Nevertheless after 1960, the technique of CBA is being vigorously

\textsuperscript{15} Hereafter Cost-Benefit Analysis shall be mentioned as CBA in our discussion.

\textsuperscript{16} For the list of various studies in this field in U.S.A. see G.H. Peters: Op.cit., P.19.
used in social investment projects also such as education and health because, the CBA has undergone several changes over time in its definition and implication.

The benefits of education accrue primarily to individuals through increases in potential earning power, but there are also 'external' benefits. Some of these such as increases in productive power of society as a whole, are in principle measurable in economic terms. Others are far less tangible. As mentioned earlier attempts are made to measure the efficiency of educational expenditures by this cost-benefit technique (rate of return criterion), although many impediments are experienced. Further, efforts are also made to reconcile this approach with other approaches such as 'man power planning' and 'social demand projections'.

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18 For critical review of these impediments see G.H. Peters, op.cit., P.40.

In the present study we have attempted to apply CBA to the general higher educational investment in Karnataka. The selection of general higher education is mainly due to the fact that the CBA seems to be lacking in this area of educational investment. We have also attempted alongside to analyse some aspect of the equity problem of higher education in the State.

Of course, there are conflicting views on the appropriateness of CBA in educational planning. Nevertheless, its significance in framing educational policies in India especially where scarce resources of the country are to be wisely and carefully utilised for the balanced social and economic development of the country cannot be underestimated. With this end in view we have attempted in general to answer the following questions in course of our analysis.

i) Which is the most profitable level of general higher education both from the social and private point of view?

ii) What are the indirect benefits of higher education?
iii) Is the distribution of higher education facilities between different economic classes of people satisfies the equity principle?

Particularly this study is more significant to government in its educational policy making because, it may help in its efforts to improve the quality of general higher education in the State and to achieve equality of opportunity for higher education as well. Areas in which the study helps the government in its educational policy making are,

i) Knowledge about the most profitable form of general higher education in which resources need to be directed;

ii) Knowledge about the causes of graduate unemployment;

iii) Knowledge about the emphasis to be laid upon different levels of general higher education; and also

iv) Knowledge about the efforts of distribution of higher educational opportunities between different economic classes of people.
Data Basis:

We have collected the relevant data for our study through a field survey from those who have received higher education from a unit institution (a college) of higher education i.e. Jagadguru Shri Shivalingeshwar Arts and Science College, Gokak in Belgaum District. Selection of a single college is done from the angle of manageability from the individual researcher's point of view and the data are collected for the first time in Karnataka. Apart from this, some of the government publications and the records of some educational institutions including Karnataka University Dharwad are utilised for the necessary secondary data.

In the survey conducted in two phases, data on cross-section earnings and costs are collected. During the first phase of the survey, the information on the total number of students of the college who obtained different degrees over a span of 9 years (beginning from the academic year 1967-68 upto the academic year 1975-76) was collected, and then the information regarding the name, academic qualification and designation (if employed) of the undergraduates, graduates, double graduates and post-
graduates of the college was collected with reference to the old students Association records of the college and through personal contacts with the staff and old students of the college. The table given below shows the total number of students of the college with higher educational qualification stratified under the different levels of general higher education for the aforesaid period. A sample size of 225 students (which works out to 25 per cent of the total number of students who received higher education from this institution for the said period) is randomly chosen to collect the costs and earnings data.

Whereas the overall random sample size works out to 25 per cent of the total number, the percentages of the stratified sample of each level vary. For example, the sample size of general undergraduate is 100 per cent. For general graduates, general double graduates and general post-graduates the sample size is 14 per cent, 41 per cent and 54 per cent respectively.
## Total Number of Students: by Higher Education Level - 1976, J.S.S.College, Gokak

<table>
<thead>
<tr>
<th>Level Description</th>
<th>Total No.</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General Undergraduates* (identified)</td>
<td>58</td>
<td>58 (100.0)</td>
</tr>
<tr>
<td>(P.U.C. one year and two years courses, B.Sc.Part-I, B.A.Part-I, etc. 1 year after P.U.C. general course)</td>
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<tr>
<td>2. General Graduates</td>
<td>700</td>
<td>100 (14.0)</td>
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<tr>
<td>(B.A., B.Sc., 3 years courses after P.U.C. general undergraduate level)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. General double Graduates</td>
<td>88</td>
<td>36 (41.0)</td>
</tr>
<tr>
<td>(B.Com. 2 years course after B.A., LL.B., 3 years course after general graduation, B.Ed. and B.Lib.Sc., one year course after general graduation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. General Post-graduates</td>
<td>57</td>
<td>31 (54.0)</td>
</tr>
<tr>
<td>(M.A., M.Sc., M.Com., 2 years courses after general graduation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>903</strong></td>
<td><strong>225</strong></td>
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</tbody>
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Note: Figures in the parenthesis represent percentage to the total number in the respective level.

* B.Sc. Part-I and B.A. Part-I courses were treated as good as undergraduate courses prior to 1973-74 because, specialization in subjects in the form of principal and subsidiary (or major and minor) till then was commencing from Part-II course. This system was discontinued when 2 year F.U. Education was introduced and separated from the University administration from the year 1971-72. Specialisation since 1973-74 is to be done during 3 year university education leading to a degree consisting Part-I, Part-II and Part-III courses.
In the second phase of our survey information and data were collected through a questionnaire\textsuperscript{20} in direct interviews with (225) educated (employed and unemployed) students of the college. The questionnaire provided data on cost of education from P.U.C. to graduation and post-graduation (comprising of fees, books, stationery, lodging and boarding etc. and also on on-the-job training), employment status, and earnings (during and after education). Besides, general information on the social and economic background of the respondent's family is also ascertained. The need to conduct this kind of a sample survey arose due to the complete lack of the cross-classified data on earning, age and education. The respondents appeared to be fully co-operative in course of our interview in answering the questions contained in the questionnaire.

**Methodology and Coverage:**

In the present study we cover the following levels of general higher education for the purpose of calculating

\textsuperscript{20} For a copy of questionnaire see Appendix.
rates of return.

1. General undergraduates over matriculates
2. General graduates over matriculates
3. General graduates over general undergraduates
4. General double graduates over general graduates
5. General post-graduates over general graduates

Rates of return - both private and social - are calculated under two main categories viz. unadjusted and adjusted. In calculating unadjusted rates of return, the whole of earnings differential has been attributed to education while in calculating the adjusted rates of return the net effect of education has been separated out.

All the aforesaid rates of return are calculated by arranging the costs and earnings differentials by solving polynomial with iterative procedure. The help of the computer is sought for this purpose. To construct adjusted age-earnings profiles, earnings are standardised by adjusting socio-economic and demographic variables other than education. For this purpose we have adopted the method of regression analysis. Further as there are more than one independent variable, multiple regression analysis has been done to estimate the earnings for all levels of
general higher education under consideration.

Besides the rates of return, the present value of life-time earnings differentials are also calculated to evaluate the different levels of higher education using Benefit-Cost (B-C) criterion.

Limitations of the Study:

1) Because of the large scale unemployment prevailing among educated persons in a developing country like India, questions have been raised about the justifiability of the inclusion of foregone earnings in the costs of education. Though this point deserves consideration, we do not find any reason to exclude them outright. When an individual makes a decision on undergoing some course of education or training, it is natural for him to calculate the loss and gain involved in the process and he will surely include earnings foregone in costs. So we have included foregone earnings in the costs of higher education. This may make our rates of return biased downwardly.

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2) It is also recognised that higher incomes of those with higher educational qualification are due in part to difference in intelligence, environment, family connections, climate, discipline, motivation and other factors and not due to education alone as recognised by H.P. Miller\textsuperscript{22} and V.K.R.V. Rao.\textsuperscript{23} To isolate the effect of education alone on earnings we have adopted regression analysis only but not alpha-coefficient method as used by Denison and followed by Blaug et al. Values of regression coefficients being much smaller than the assumed alpha-coefficient, our rates of return may be biased downwardly.

3) Another broad limitation we have kept in mind is that there is no universally accepted method of calculating rates of return from education either to the individual or to the community as there is in the case of a factory or a river basin development project. It is also recognised that return from a particular level of education is not guaranteed to all individuals.

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4) The study acknowledges the operational limitation of the rate of returns approach. It only shows the direction of investment but does not indicate the exact magnitude by which the investment has to be reduced or expanded.

5) For the calculation of the net discounted present value for all levels of higher education under study, the discount rates of 6% and 9% have been chosen which are based on past and present bank rate in India. As the costs are incurred before the benefits start accruing we thought there is no need to discount the cost in educational project. As such only the earnings profiles are discounted back to present value.

6) Another limitation of the study is in respect of coverage. Only general higher education is covered. Professional higher education like Medical and Engineering is excluded due to non-response of the students who are spread over distant parts of the State and even outside. Besides, professional graduates of the institution being very small in number, inclusion of the sample seemed to yield no satisfactory result required for the study. Therefore, the study should be viewed as an initial
attempt in conducting further studies in other types of higher education in the State.

7) Other side-income of the respondents which can directly or indirectly be attributed to education could not be incorporated in our age-earnings profiles as no such information could be collected.

8) In the study adjustment for wastage and mortality could not be made due to paucity of data and information. Adjustment for secular growth of income is also not made as it is believed to be based upon subjective value judgement. Hence our rates of return would be biased downwardly. Adjustment for unemployment is made by including the unemployed samples also in each level of higher education (excluding undergraduation). This would also make our rates of return biased downwards.

9) In preparing age-earnings profiles, we had to experience the limitation of non-availability of some data. For example, earnings data for some age groups were not available. Therefore, as a second best method, we have used the information about the increments in a given age
group to estimate the earnings for the other age groups for which the actual earnings figures were not available from the survey data.

**Layout of the Study:**

The study begins with an analysis of the role of public expenditure in the national economy in general and emphasizes the role of social expenditures in economic development and social justice in particular. Next we consider the important aspect of public expenditure i.e., efficiency criteria in public spending. The Cost-Benefit Analysis (CBA) which is being immensely used as a technique to evaluate the public expenditure project and know its efficiency thereby is discussed. The whole of the above discussion is covered in Chapter II. In the next Chapter i.e., Chapter III the application of CBA to educational projects is discussed in detail. The discussion covers the types of rate of return to education, enumeration of costs and benefits of education and the method of calculation including the distributional effects of educational investments. The above analysis forms the Part I of the study.
Part II of the study proceeds with the empirical investigation. In Chapter IV beginning with social and economic background of students interviewed, we enumerate the entire cost components of general higher educational service in Karnataka (private, public and social) including opportunity costs for different levels of general higher education on the basis of our field survey and add up the total costs. In the next Chapter we attempt to measure the benefits of higher education viz. direct benefits (by constructing age-earnings profiles) and indirect benefits (intangibles). Chapter VI deals with regression analysis to know the effect of education on earnings by isolating the effect of education from other factors affecting earnings. As a logical step in Chapter VII we calculate adjusted and unadjusted rates of return with present value estimates followed by private and social returns and the results are analysed. In the final Chapter i.e., Chapter VIII, policy implications on decision-making followed by equity aspect of higher education in Karnataka with particular emphasis on the distribution of higher education facilities among economic classes and issues concerning public and private sectors in educational finance are discussed and suggestions are made followed by conclusions of the study.