CHAPTER VI

ASSESSING ECONOMIC CONTRIBUTION OF PRIMARY EDUCATION IN TAMIL NADU

EXTERNAL PRODUCTIVITY

Measurement problem of effects of primary education on economic growth

6.1.1. Investments or the accumulation of capital is a necessary condition of economic growth. This is agreed on by economists, although many differences exist about the way in which investment operates to raise the national product, about its relationship with technical change in the economy and about the optimum allocation of investment between different sectors of the economy.[1] Even within one sector like education there is the problem

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1. John Sheehan: The Economics of Education, George Allen & Unwin Ltd., London, 1973. p.59.

of allocation to reap optimum benefits. In education difficulty is one of the measurements. This arises from the fact that education as an investment does not have an independent existence; it is 'embodied' in human beings, or, more specifically in members of the labour force. Thus, while physical capital, having an independent existence, in principle identifiable and measurable as a factor of production and also has a return which is measurable, education is intangible and not measurable apart from the labour in which it is embodied and its return or earnings is also mixed with the return to labour. A further difficulty in analysis of education and economic growth is the long term nature of education investment. However these difficulties are not insuperable; economists have succeeded in devising analytical frameworks in which the role of education in economic growth may be examined. And some of them have measured the effects of education on growth.

6.1.2. Educational progress explained a very important part of economic growth; the return on the cost of schooling revealed itself to be much greater than the return on material investments; techniques of economic planning could be applied to the realm of education, which would allow priorities to be determined and resources to be used in the most effective way; new methods of predicting the needs for qualified manpower would assure the harmonization of the economic objectives of education with those of the economy. Education is not only a precondition of economic development, but also a factor in growth. The expenses of schooling must no longer be considered in an indifferent way; one must realize its structural and qualitative characteristics

especially levels of training and professional qualifications.

Educational pyramid — India and Tamil Nadu

6.1.3. The ratio between enrolment percentage in primary level and the enrolment percentage in higher education in Tamil Nadu was 47 in 1960-61 and it was 29 in 1966-67.[2] The corresponding ratios for India were 25 and 19. It implies University education has expended at much faster rate in Tamil Nadu during the period. In terms of rates of return, higher education ranks far below primary schooling. The rate of return on completing the primary years is as a rule the highest.[3] The apparent reasons for this result are as follows : (1) For a person to remain litorate over his lifetime, more than four years of schooling is usually required. (2) The economic value of having the ability to read and write is much enhanced by the opportunities that are forthcoming in a dynamic economy; this is the ability to decode, interpret, and act efficiently in taking advantage of technical change and new economic information. It is this particular ability that is the source of the 'allocative benefits'. It is true that these allocative benefits continue to increase with more education. However, when the total real costs of the additional education are reckoned, the rates of return tend to be highest for the fifth and subsequent primary years in most of the developing countries. (3) Among the educational options, there is in most countries a longstanding bias in favour of higher

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2. S.C.Goel: Education and Economic Growth. The Macmillan Company of India Ltd.,1975. p143.
3. T.W.Schultz: A 'Guide' to investors in Education with special reference to developing countries, in Education and Development Reconsidered, The Bellagio Conference Papers, Praeger Publishers,New York,1974. p.52.

education. Educators tend to nurture this bias. Universities like steel mills, are symbols that enhance national prestige. The influential classes want their children to acquire a university education, preferably at public expense.

Rate of return and neighbourhood benefits

6.1.4. There are relevant data for 10 developing countries, and in most of these Brazil, Malaysia and the Philippines are exceptions, primary education yields higher social rates of return than any other level of education.[4] The benefits of education in rate of return analysis are taken to be the extra income payments that typically accrue to people with additional education, and many commentators have drawn attention to the so called externalities or neighbourhood effects of education that are not reflected in personal income flows.

Education and Social Justice

6.1.5. Education is the 'equalizer' opening the door of economic opportunity to the masses. It has been widely assumed that as education expanded, its social and economic benefits would be distributed fairly. But there is now concern that, unless special and deliberate efforts are made, education may benefit most those whose parents already have advantages and who will thereby draw further away from the rest of the society to which they belong. Moreover, it is held that, in the developing

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4. Mark Blaug: Educational Policy and the Economics of Education: Some practical lessons for educational planners in developing countries, in Education and Development Reconsidered, The Bellagio Conference Papers, Praeger Publishers, New York, 1974. p.26.

countries, there has been excessive attention to higher education, at the expense of the masses of the people.

Socialising effects of education

6.1.6. Schooling makes people more productive not just by imparting cognitive knowledge but also by 'socialising' them in various ways: punctuality, achievement motivation, the willingness to take orders and to accept responsibility are no less vocationally useful skills than the ability to turn a lathe or to read a technical instruction.

Other benefits

6.1.7. In accounting for the benefits from education, it is not sufficient to look only at the higher earnings associated with more education. There are private satisfactions associated with education. It is appropriate to think of these as cultural satisfactions that accrue to the student over his life time. Although they are non-pecuniary rewards that defy estimation, they must nevertheless be kept in mind. It is revealed in 'head start' that children benefit from their mother's education, thus this particular social benefit enhances the educability of the subsequent generation. The other social benefit that is not on the list is the 'allocative benefit', meaning the observed increases in ability associated with the rise in education in decoding and interpreting new technical and economic information pertaining to production and consumption, and as a consequence, the more educated adjust their behaviour more rapidly (with a shorter lag) than do the less educated. Both the Head Start gains that accrue to children from the education of mothers and the allocative

gains, are not restricted to higher education. They are important social benefits associated with primary and secondary schooling as well.

6.1.8. The bearing and rearing of children are also an integral part of the economics of the household. It is the wide array of effects of the education of females that the investors in education in the developing countries can ill afford to overlook. The organizational efficiency of the household and its contribution to family consumption appears to depend in substantial part on the level of the schooling of the women. Most women in the developing countries are poorly equipped in terms of the schooling that is required to manage their households skillfully in taking advantage of new technical information with respect to nutrition, health and child care. Another favourable effect of the schooling of women is the improvement in their ability to to decode, interpret and successfully adopt the new, superior contraceptive techniques. The acquisition of more schooling by females tends to raise the age of marriage, a potent force in reducing fertility. Thus, the implication of compulsory school attendance for more years than has been traditional (many females presently do not attend school at all) is strong and clear with respect to reducing fertility. The most important effect of the schooling of females may well be the social benefit that arises out of the marked advantage that children derive from being reared in homes where the mothers have this schooling. There is a growing body of evidence in support of the inference that the level of schooling of mothers is most important in accounting for the quality of the inputs they provide

for their children. It is this class of social benefits that argues strongly for more public investment in the education of women. Whereas in the case of males, the gains in productivity from more schooling accrue predominantly to those who acquire the schooling, in the case of females there are substantial benefits that accrue to society.

Derived Demand

6.1.9. The wage and/or income differential between jobs in the 'modern' sector (m) and those outside the modern sector (such as family farming, rural and urban self-employment), which for simplicity we can designate as the 'traditional' sector (t). Entry into modern-sector jobs is dependent initially on the level of completed education, whereas income-earning opportunities in the traditional sector do not have any fixed educational prerequisites. If we designate W_m as the modern-sector wage and W_t as the traditional-sector wage, then the greater the modern-sector-traditional-sector income differential, $W_m - W_t$ (or, for all practical purposes, we might call this the urban-rural income differential), the greater will be the demand for education. Thus, our first relationship states that the demand for education is positively related to the urban-rural or modern-traditional wage differential.

6.1.10. To a large extent individual students and their families view education as a passport for entry into the modern, urban industrialized economy with its disproportionately high-paying employment opportunities. In this sense, the demand for education, therefore, can be seen as a 'derived demand' for high-income earning employment opportunities.

A Study on Indian States

6.1.11. Table VI-1 shows the relation between modern-traditional wage rate differential and educational demand in 1960-61. The daily wage rates in factories such as cotton, sugar, rice, paper and paper-board, woollen textiles were considered as wage rates in modern sector. To arrive at a common index the simple Arithmetic Mean of the wage rates have been calculated and shown as W_m. The traditional wage rates in rural agricultural sector is shown as W_t. The difference between these two rates is shown as $W_m - W_t$. The rank is shown in column 12. In calculating the above index, Assam has been omitted as the wage rates relating to the modern sector for the year 1960 were not available. Kerala has also been left out, as it has reached the saturation level in educational enrolment long before due efforts taken by the Maharaja's of Travancore-Cochin state and also due to greater influence of christian movement. The rest of the 11 comparable states, the enrolment ratios for lower primary and higher primary levels have been taken as the indices of educational demand and the respective ranks are shown in columns 14 and 16.

6.1.12. A correlation analysis between the wage differential and the educational demand at lower primary level yields a coefficient of +.318. It is positive but it is not significant. As far as the educational demand at higher primary level is considered, there is positive correlation between the modern traditional wage differential and education demand. The coefficient is +.473 which is near significant level.

TABLE VI.1

RELATION BETWEEN MODERN AND TRADITIONAL WAGE RATE DIFFERENTIAL AND EDUCATIONAL DEMAND IN COMPARABLE STATES OF INDIA 1960

S.No.	State	Daily wage rate in factories: Cotton	Sugar	Rice	Paper & Paper-board	Cement	Woollen textile	Total	Mean W_m wage rate	W_a adult male agricultural worker rate	Difference $W_m - W_a$	Rank	Enrolment ratio (60-61) I to V	Rank	Enrolment ratio VI to VIII	Rank
1.	Andhra Pradesh ..	3.68	4.56	2.40	—	4.56	—	15.20	3.80	1.29	2.51	6	68.3	5	16.8	8
2.	Bihar ..	—	3.28	2.32	—	4.56	—	10.16	3.39	1.33	2.06	9	50.7	9	17.1	7
3.	Gujarat ..	6.24	4.40	—	—	6.00	4.72	21.36	5.34	1.83	3.51	2	72.1	4	26.3	4
4.	Madhya Pradesh ..	5.36	3.44	1.92	4.48	3.60	—	18.80	3.76	1.62	2.14	8	49.2	10	15.5	10
5.	Madras (Tamil Nadu) ..	5.28	4.40	1.52	—	5.92	—	17.12	4.28	1.30	2.98	4	85.8	1	31.6	1
6.	Maharashtra ..	6.72	4.88	—	4.48	—	5.20	21.28	5.32	1.42	3.90	1	77.3	2	27.8	3
7.	Mysore (Karnataka) ..	4.56	4.24	1.84	—	—	—	10.64	3.55	1.55	2.00	10	73.8	3	22.4	5
8.	Orissa ..	—	—	1.68	4.88	—	—	6.56	3.28	1.31	1.97	11	63.7	7	9.0	11
9.	Punjab ..	—	—	—	4.00	—	4.48	8.48	6.12	2.35	1.77	7	50.8	8	29.4	2
10.	Uttar Pradesh ..	4.64	8.40	2.08	3.60	—	3.92	22.64	4.53	1.41	3.12	3	44.7	11	16.6	9
11.	West Bengal ..	3.60	6.40	—	4.64	—	4.08	18.72	4.68	1.76	2.92	5	64.9	6	21.7	6
	INDIA ..	5.84	9.60	1.92	4.48	4.80	4.32	30.96	5.16	1.60	3.56		62.4		22.5	

Source : Columns 1 to 11 : Computed from 'Movement of wage rates in India 1950-51 to 1965-66 by V.M.Kothari, University of Bombay, 1976

Columns 13 and 15 : The Indian Year Book of Education, 1961.

PRIMARY EDUCATION AND GNP RELATIONSHIP

Interstatal comarison

6.2.1. A correlation analysis[5] made by comparing the percentage of enrolment at primary level (I to V) classes and the per capita income reveal significant relationship between enrolment ratios and per capita income over the period 1960-61 to 1966-67. The chief merit of inter-state comparisons is that in spite of the great diversity of languages, cultures, values and ethos, all of them have the same unit of currency and each one is governed by the same constitution. This is more valid in respect of primary education because all states follow the national policy in primary education even though education is a state subject. This means that within certain norms of behaviour imposed by bodies like the Planning Commission, every state is free and has a licence to experiment with education. Since the focus of this study is on the relationship between education and economic growth, a legitimate question that may arise is whether the educational output of one state may not be the economic input of another state. This is theoratically feasible and also takes place to a limited extent but not to a point when one would seriously consider the economic consequences of the mobility of human capital.

6.2.2. The correlation coefficient as analysed above and the regression equation for the various states and India are shown in Table VI-2.

6.2.3. The first hypothesis that is tested here is that the aggregate private demand for education goes up with

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5. S.C.Gool: op cit. p.

TABLE VI-2

CORRELATION COEFFICIENT AND THE REGRESSION EQUATION FOR VARIOUS STATES AND INDIA

(I-V CLASSES)

S.No.	State	Correlation coefficient	Regression equation
(1)	(2)	(3)	(4)
1.	Andhra Pradesh ..	.5958	Y=49.2303 + .0398 X
2.	Assam ..	.7563	Y=46.0295 + .0536 X
3.	Bihar ..	.8136	Y=38.3805 + .0407 X
4.	Gujarat ..	.7708	Y=65.1538 + .0674 X
5.	Himachal Pradesh ..	.2663	Y=29.5102 + .0844 X
6.	Jammu & Kashmir ..	.9253	Y= 9.0536 + .1160 X
7.	Karnataka ..	.8951	Y=21.2279 + .1361 X
8.	Kerala ..	.9229	Y=72.5824 + .0475 X
9.	Madhya Pradesh ..	.8360	Y=16.0789 + .1092 X
10.	Maharashtra ..	.9617	Y=44.9944 + .0488 X
11.	Orissa ..	.8964	Y=34.0994 + .1058 X
12.	Punjab ..	.7947	Y=32.3211 + .0784 X
13.	Rajasthan ..	.7669	Y= 6.4325 + .0964 X
14.	Tamil Nadu ..	.9033	Y=22.4073 + .1786 X
15.	Uttar Pradesh ..	.9824	Y=-11.5869 +.2077 X
16.	West Bengal ..	.8438	Y=14.5149 + .1269 X
	ALL INDIA ..	.9432	Y=24.7086 + .1042 X

Source : Education and Economic Growth by S.C.Goel, The Macmillan Company of India Ltd.,1975.

Note : Correlation found between enrolment and Gross National Product over 1960-61 to 1966-67

the growth of per capita income, provided education yields greater satisfaction in the form of higher wages or greater capacity to enjoy culture and leisure than the monetary and non-monetary satisfactions derived from investment in physical or share capital at a point of time when the decision to invest in education is taken. This tendency of the demand curve for education to rise upwards in response to increase in per capita income applies to India as a whole and to each state individually as shown by the high and positive correlations between the per capita income on the one hand and the enrolment ratio for the years 1960-61 to 1966-67. The value of the coefficient of correlation differs from one state to another; but the correlation is significant.

Inter State comparison

6.2.4. Table VI-3 shows the enrolment ratio at primary level (I to V) classes and per capita income of the states in 1960-61 and 1966-67.

6.2.5. The coefficient of correlation (r) and rank correlation (r_s) between education and the growth in one state with the other state showed that $r = .30$ and $r_s = 0.28$ in 1960-61 They are 0.41 and 0.62 for 1966-67. It is noted that the coefficient of correlation are higher in 1966-67 than in 1960-61, which could either be interpreted as the effect of education on income or as better adjustment between the demand for education and per capita income.

6.2.6. The coefficients of correlation derived from inter-state comparisons are lower than the corresponding figures for each state over a period of time. This can be attributed to (a) central subsidy for education,

TABLE VI.3

ENROLMENT RATIO AND PER CAPITA INCOME AT PRIMARY LEVEL OF THE STATES IN 1960-61 AND 1966-67

Sl. No.	State	1960-61		1966-67	
		Enrolment ratio	Per capita income	Enrolment ratio	Per capita income
(1)	(2)	(3)	(4)	(5)	(6)
1.	Andhra Pradesh ..	56.5	275	65.8	445
2.	Assam ..	61.3	311	68.2	500
3.	Bihar ..	44.9	211	50.6	315
4.	Gujarat ..	84.9	362	97.9	554
5.	HimachalPradesh..	50.1	359	68.0	440
6.	Jammu & Kashmir..	41.5	297	55.9	457
7.	Karnataka ..	56.8	285	72.1	428
8.	Kerala ..	84.0	265	93.1	447
9.	Madhya Pradesh ..	45.1	268	56.5	392
10.	Maharashtra ..	65.0	409	72.7	610
11.	Orissa ..	59.0	249	67.6	332
12.	Punjab ..	54.1	374	72.9	720
13.	Rajasthan ..	33.9	318	40.0	441
14.	Tamil Nadu ..	75.5	335	93.1	509
15.	Uttar Pradesh ..	36.0	246	70.2	446
16.	West Bengal ..	52.1	317	67.6	449
	ALL INDIA ..	53.4	306	69.5	483

Source : Education and Economic Growth by S.C.Goel, The Macmillan Company of India Ltd.,1975.

Note : Primary level in this book represents I to V classes

which is essentially on pro-rata basis and will therefore create relatively more demand for education in the better off states by enhacing the private returns from education, (b) the level of subsistence or minimum basic needs as distinguished from per capita income, beyond which individuals and families in a particular state are in a position to invest in education and (c) returns from education which will differ from state to state depending on the level of weighted composite index of educational development and other relevant factors.

Literacy and per capita income

6.2.7. Literacy percentages indicate the cumulative effects of education on the population. An inter state comparison between literacy rates and per capita income will enable to identify the relationship between them. Table VI-6 gives the percentage of literacy and per capita income of the states in 1970-71.

6.2.8. Rank correlation coefficient between columns 4 and 6 works out as 0.475 which implies the positive relationship between literacy and income and the magnitude of correlation is moderate. It can be either way: Gross National Product influencing literacy level and literacy percentage affecting the Gross National Product. The relationship between Net State Domestic Product and percentage of literacy is shown in the Scatter Diagrum.

PARTICIPATION OF LITERATE FARMERS

6.3.1. The positive relation between agricultural production per work force and percentage of literacy was

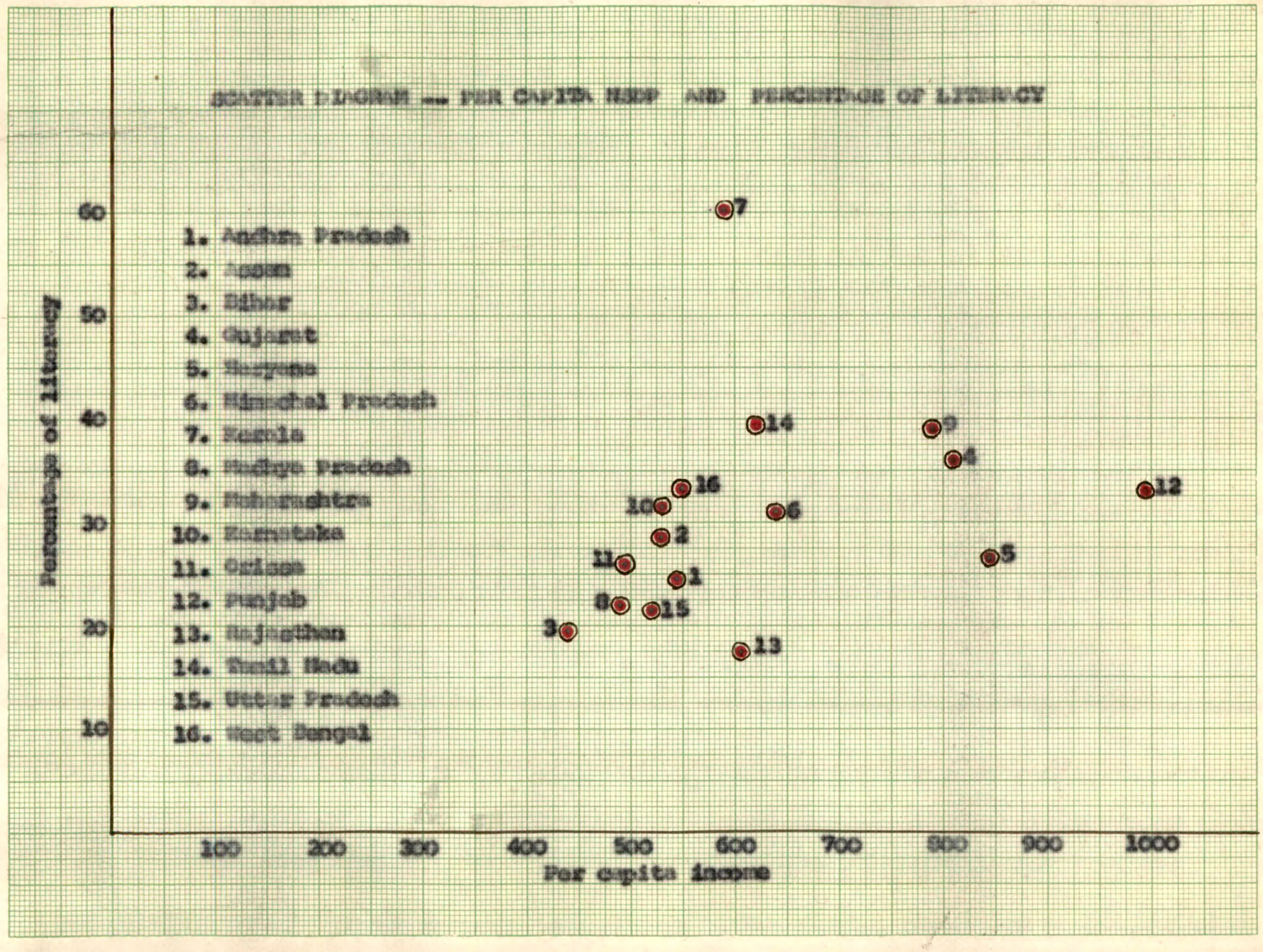
TABLE VI-4

RELATION BETWEEN PER CAPITA NSDP AND PERCENTAGE OF LITERACY OF STATES IN INDIA

S.No.	State	Per capita income (1970-71)	Rank	Percentage of literacy (1971)	Rank
(1)	(2)	(3)	(4)	(5)	(6)
1.	Andhra Pradesh ..	545 (Q)	10	24.56	12
2.	Assam ..	528 (P)	12	28.81	9
3.	Bihar ..	437	16	19.79	15
4.	Gujarat ..	809 (P)	3	35.72	4
5.	Haryana ..	844 (P)	2	26.69	10
6.	Himachal Pradesh ..	630 (P)	5	31.32	8
7.	Kerala ..	590 (P)	8	60.16	1
8.	Madhya Pradesh ..	490	15	22.12	13
9.	Maharashtra ..	788 (P)	4	39.08	3
10.	Karnataka ..	530 (P)	11	31.54	7
11.	Orissa ..	496 (P)	14	26.12	11
12.	Punjab ..	995 (P)	1	33.39	5
13.	Rajasthan ..	603 (P)	7	18.79	16
14.	Tamil Nadu ..	618 (P)	6	39.39	2
15.	Uttar Pradesh ..	520 (P)	13	21.64	14
16.	West Bengal ..	549 (P)	9	33.05	6

(P) = Provisional (Q) = Quick

Source : Net State Domestic Product, Tamil Nadu 1960-61 to 1974-75, The Directorate of Statistics, Government of Tamil Nadu, Madras


SCATTER DIAGRAM — PER CAPITA NDP AND PERCENTAGE OF LITERACY
1. Andhra Pradesh
2. Assam
3. Bihar
4. Gujarat
5. Haryana
6. Himachal Pradesh
7. Kerala
8. Madhya Pradesh
9. Maharashtra
10. Karnataka
11. Orissa
12. Punjab
13. Rajasthan
14. Tamil Nadu
15. Uttar Pradesh
16. West Bengal
Percentage of literacy
60
50
40
30
20
10
100
200
300
400
500
600
700
800
900
1000
Per capita income

established by the analysis already made in Chapter-I. The agricultural research staff and the extension officers in Agriculture Department are closely associated with the agricultural labourers and farmers. The data collected on the basis of an Opinionnaire issued as in Appendix-IV corroborated the effects of primary education on agricultural production.

6.3.2. The total number of farmers normally contacted per year by the seventeen Research and Extension Officers included under the study are 41,570. Table VI-5 shows how the literate farmers who have completed at least primary education are better in various activities connected with agriculture.

6.3.3. The Agricultural Extension Officers were asked to record their ratings on statements about the relative performance of literate and illiterate farmers. A five-point scale was used as given below :

Always 5, Mostly 4, Sometimes 3, Rarely 2
Never 1.

The maximum score for each of the eleven statements was 85 (17 x 5). There was only one negative entry against the item techniques. All other entries were positive. Out of the maximum weighted score of 935 for all the 11 items, the total score obtained is 728 which works out to be 78 percent. This establishes scientifically how the literate farmers contribute better to agricultural production than illiterate farmers. Individual items also have scored favourably well out of which 'understanding the new ideas' acquired maximum weighted score of 70 and a percentage of 82. The lowest score is for

TABLE VI.5

PARTICIPATION OF LITERATE FARMERS IN AGRICULTURAL ACTIVITIES

S.No.	Item		Weighted score	Percentage to maximum score
1	2		3	4
1.	Contribute better in farm production	..	69	81.2
2.	Have better knowledge of techniques of farming	..	65	76.4
3.	Understanding better new ideas	..	70	82.4
4.	Apply new methods	..	65	76.4
5.	Acquire and grasp skills of farming	..	69	81.2
6.	Show better interest	..	66	77.7
7.	Developed better attitude to agricultural extension work	..	67	78.8
8.	Make use of modern tools of production more often	..	65	76.4
9.	Use proper fertilisers with better understanding	..	66	77.7
10.	Understand the soil technology and management better	..	64	75.3
11.	Make better use of available water for irrigation	..	62	72.9

Note : Maximum weighted score = 85

Source : Computed from opinionnaires received from Agricultural Extension and Research Officers in Agriculture Department

item 11, 'make better use available water resources' which is 62 and for which the percentage is 73.

EFFECTS ON WORKERS IN MANUFACTURING INDUSTRIES

Earnings differential

6.4.1. In agricultural industry, most of the agricultural labourers were paid daily wages which is fixed irrespective of educational qualification. The wage differential could be seen in case of agricultural labourers utilised for applying modern techniques and tools such as tractor, whereas in respect of manufacturing industries there is visible wage differentials, mostly according to the qualification. A study taken at State level in 1970-71 census indicated the wage differentials between illiterates, primary school completers and higher primary school completers in Tamil Nadu as shown in Table VI-6. It is a statewide study covering a large sample of 25,44,227 persons in all upto post-graduate level. In three levels mentioned, the Survey covered 11,43,849 persons.

TABLE VI-6

WAGE DIFFERENTIALS BETWEEN ILLITERATES, LOWER PRIMARY SCHOOL COMPLETERS AND HIGHER PRIMARY SCHOOL COMPLETERS IN TAMIL NADU

Qualification level	Number of persons contacted	Mean earnings per annum	Earnings differentials over previous qualification
		Rs	Rs
Illiterates ..	4,98,801	990	-
Lower primary school completers ..	3,51,142	1586	606
Higher primary school completers ..	2,93,906	1775	189

Source : National Sample Survey, 1970-71, Directorate of Statistics, Madras

6.4.2. In the above earnings, income from other sources such as property has been excluded and only earnings from employment (including self-employment) has been calculated.

Shankarnagar study

6.4.3. We undertook a study (1976) in one of the manufacturing factories in Tamil Nadu which also corroborated the view. The study was undertaken in the India Cement Factory at Shankarnagar, Tirunelveli District. The study covered all the workers and employees in the Cement Factory. There were 1,644 employees, out of which 1,394 persons were workers with educational qualifications of Standard VIII and less. Table VI-7 shows the mean monthly earnings, qualification and age-wise in addition to the number of workers in each category.

TABLE VI-7

QUALIFICATION AND AGE-WISE MONTHLY EARNINGS OF WORKERS IN A CEMENT FACTORY IN TAMIL NADU (1975-76)

Age	Illiterates		Below V Std.		Passed V Std.		Passed VIII Std	
	No.	MME	No.	MME	No.	MME	No.	MME
15-20 ..	-	-	-	-	-	-	-	-
20-25 ..	6	402	3	409	6	414	8	417
25-30 ..	38	437	13	447	12	478	13	483
30-35 ..	79	426	32	421	58	459	40	485
35-40 ..	92	456	53	449	108	455	53	489
40-45 ..	118	446	64	462	107	470	35	509
45-50 ..	61	469	66	495	75	523	38	601
50-55 ..	30	461	50	520	49	519	35	621
55-60 ..	13	469	13	514	14	532	12	726
TOTAL ..	437	446	284	465	439	481	234	543

Note : MME = Mean monthly earnings;
Totals under MME means Mean of the monthly earnings

Source: Data sheets received from India Cements Ltd., Shankar Nagar, Tirunelveli District, Tamil Nadu

6.4.4. Though there is no vast difference, it is seen that as qualification increases maximum salary also increases. We find the following variations in the monthly earnings at the age 20-25 and 55-60 :

Age level	Mean monthly earnings			Differential of V passed over Illiterates	Differential of VIII passed over V passed
	Illiterates	V Std. passed	VIII passed		
				Rs	Rs
20-25 ..	403	414	417	11	3
55-60 ..	469	532	726	63	94

6.4.5. It is seen that the monthly wage differential is not appreciable at the age level 20-25. It is quite noticeable at the age level 55-60. The annual differential works out to Rs 63 x 12 = Rs 756 and Rs 94 x 12 = Rs 1,128, i.e., the annual wage differential of the Standard V passed over illiterate is Rs 756 and that of the Standard VIII passed over Standard V passed is 1128. In the case of State Sample the wage differential in respect of Standard VIII passed over standard V passed is less. It may be due to non-uniformity of salary in different sectors but within the single firm where the pay structure is uniformly applicable, the wage differential is quite discernible. We thus see that the higher is the level of education, the wider becomes the earnings differential at higher age-groups.

Effects on family size

6.4.6. As already discussed in the first chapter in addition to measurable economic effects education has

other spill over benefits which have major impact on economy as a whole. The attitude to small family size is the most vital and crucial benefit of education. All our developmental activities are outweighed by the population explosion and unless the population is controlled, there will be no development in 'real' terms.

6.4.7. An in-depth micro study was undertaken by us. The workers in the Cement Factory at Rajapalayam were served with a Questionnaire (Appendix-V-A). The questionnaire was served on stratified sample basis and the sample size was 300. In the case of illiterates, they were interviewed and their responses were recorded.

6.4.8. Table VI-8 as revealed by the special study establishes the hypothesis that education up to the primary level at least creates positive attitude to family size and the family of educated persons consists of less number of members.

TABLE VI-8

QUALIFICATIONWISE PERCENTAGE OF FAMILIES ACCORDING TO THE NUMBER OF FAMILY MEMBERS IN A CEMENT FACTORY IN TAMIL NADU (1976)

Grade	Number of family members					
	Upto 4		5 and 6		7 to 10	
	No.of family heads	Percentage	No.of family heads	Percentage	No.of family heads	Percentage
Illiterates ..	3	6.7	15	33.3	27	60.0
I to V ..	21	20.0	48	47.0	33	33.0
VI & above ..	81	52.0	60	37.5	12	10.5
TOTAL ..	105	35.0	123	41.0	72	24.0

6.4.9. It is seen that in the case of illiterates the percentage of family with members up to 4 is only 6.7 whereas the percentage of family with members 7 to 10 it is 60. The corresponding percentages for the families in which the family head, the worker, has studied Standard VI and above are 52.0 and 10.5. The number of families with more children is less in the families in which the parent has educational qualification of Standard VI and above. It is worthy to note that while in the sample as a whole only 35 percent of the families are in the size group of 4 or less, for the families in which the heads had studied Standard VI and above, the percentage is as high as 52. For families in which the heads have studied Standard I toV, the percentage is only 20. The percentage in respect of illiterate families is as low as 6.7. The position is reversed in the case of families with members 7 to 10. While in the sample consisting of 72 family heads the mean percentage of families having 7 to 10 members is 24, for the families in which the heads are illiterates the percentage is as high as 60. In respect of families with heads who have studied Standard VI and above, the percentage is 10.5 which is less than the mean percentage for the sample 24. Thus it is inferred that as qualification increases the percentage of families with more number of children decreases. That is education has an effect of reducing the family size.

6.4.10. An analysis regarding the usefulness of Family Planning methods, operation and need for Family Planning shows almost all the workers have given positive replies. Probably, the workers' education-programme helped them to know the significance of Family Planning.

Productivity and quality of educated labour force

6.4.11. With a view to ascertain the relative performance of illiterates and educated workers with regard to productivity and quality of work an opinionnaire as shown in Appendix- V-B was served on all supervisors and foremen numbering fortysix in the Cement Factory at Rajapalayam. As the supervisors/foremen are in close contact with the workers and are in charge of supervising the workers under their control their opinion regarding the productivity and quality of work turned out by the workers will throw much light in the matter. They were given a five-point scale to record their opinion under nine items related to productivity and quality of work. The points attributed to their responses are as follows :

Always 5, Mostly 4, Sometimes 3,
Rarely 2, Never 1.

The maximum weighted score would be 230 and the minimum would be 46. The itemwise scores as replied by the supervisors/foremen who are in charge of the workers are tabulated as follows :

TABLE VI-9

ITEMWISE SCORES AS REPLIED BY THE SUPERVISORS WHO ARE IN CHARGE OF THE WORKERS IN A FACTORY

S.No.	Item	Weighted score	Percent to maximum weighted score
1.	Understands the work assigned ..	197	86.7
2.	Production of work is better ..	188	82.7
3.	Do better quality work ..	194	85.4
4.	Less wastage ..	188	82.7
5.	Participate in workers education ..	195	85.8
6.	Interest in knowing more techniques/methods ..	204	88.5
7.	Better attitude to work ..	185	80.3
8.	Attend to duty regularly. ..	193	84.9
9.	Adapt better when internal changes in the job assignments are made ..	190	83.6

THE NEED OF PRIMARY EDUCATION FOR QUALITY WORK AMONG CONSTRUCTION WORKERS

Sample and Methodology

6.5.1. Next to manufacturing and commercial industries, large number of workers are engaged in construction and allied industries. With a view to ascertain whether Primary Education helps to improve quality of construction work, a questionnaire (Appendix-VI) was designed and administered on contractors who employ large number of workers. This was done through the Tamil Nadu Housing Board, which employs a large number of contractors and construction workers throughout the year and therefore their views will be based on real experience. The total number of workers employed by these contractors were as follows :

(a)	Illiterates ..	782 persons
(b)	Studied I-V Standards.	350 persons
(c)	,, V-VII ,, ..	155 persons
(d)	,, VIII ,, ..	80 persons
(e)	Passed IX Standard ..	45 persons
	Total ..	1412 persons

The views expressed by the contractors were tabulated and the percentage of positive replies was worked out in respect of the two major areas : (a) whether they prefer at least persons with primary education for supervisory posts (maistry) and (b) whether workers with primary education do better quality work than illiterates. The findings are discussed in the succeeding paras.

Education--Prerequisite for a supervisor's job

6.5.2. All the contractors prefer persons qualified in higher primary education for the job of a supervisor called 'maistry'. Table VI-10 shows the reasons for preferring persons qualified up to higher primary education for supervisory jobs and the percentage of contractors who responded in the affirmative.

TABLE VI-10

REASONS FOR PREFERING HIGHER PRIMARY SCHOOL LEAVERS FOR MAISTRY'S JOB

Type	Percentage of contractors
Prefer Standard V-VIII qualified persons for supervisory staff because..	
(a) they can plan the work of the day ..	98
(b) they can understand better the job details ..	98
(c) they can guide the persons working under their supervision ..	94
(d) they can do the computation involved in executing the work such as the ratio of mixing etc. ..	92
(e) they can identify easily the mistakes of the workers under their supervision ..	94

6.5.3. More than 90 percent of the contractors feel that the services of educated workers (primary level) will be essential to plan, to know job details, to guide, to make computation and to identify mistakes of workers under their control.

Educated workers do quality work

6.5.4. When the contractors were asked whether educated workers do better quality work, almost all of them have expressed favourably. Table VI-11 shows the percentage of contractors who responded positively for each of the items.

TABLE VI-11

REASONS FOR PREFERING PRIMARY SCHOOL LEAVERS AMONG MALE/FEMALE WORKERS FOR QUALITY WORK

Items of quality work		Percentage of the response
Prefer I to V Standard qualified persons among male/female workers to do better quality work because of their ..		
(a) Neatness in execution	..	66
(b) Good finishing	..	86
(c) Quickness in understanding the job details	..	92
(d) Better understanding of the instructions of the contractors or maistry	..	94

Items 3 and 4, namely quickness in understanding the job and better understanding of the job instructions are essential for increasing productivity. Some general education is considered essential by majority of the contractors.

RATES OF RETURN ON INVESTMENT IN PRIMARY EDUCATION IN TAMIL NADU

6.6.1. The investment approaches to educational planning

which can be called modern, brought about a revolution in economic thought. They put education in the list of productive economic factors, and gave altogether a new attitude to the theory of capital, considering thus the expenditure on education as an investment and educated man as human capital. The most prominent approach among the modern approaches is the Rate of Return Approach. This approach is widely used in decision making of investment both in educational sector as well as in other sectors.[6]

Theoretical frame work to Cost Benefit Analysis

6.6.2. The technique of cost benefit analysis (or the return approach) is used to evaluate an educational project (student) to help rational decision-making regarding the investment choices to be made in the field of education. The internal rate of return equates the algebraic sum of present value of (direct and indirect) cost and present value of (direct and indirect) flow of benefits to zero. For calculating the rates of return, direct and indirect components of cost and benefits are priced in terms of money. Non-monetary aspects of costs and benefits are enumerated and analysed to give a complete picture of investment effectiveness of an educational project.

Objections

6.6.3. The rate of return approach is widely challenged for its severe pit-falls, like its assumptions against reliance on tradition-bound wage structure, failure to

6. Jandhyala B.G.Tilak: Approaches to Educational Planning and their applications in India, in The Indian Economic Journal, Vol.24, Jan-Mar,1977, No.3. p.265.

capture non-monetary benefits of education, Job-satisfaction, indirect benefits etc. Specifically this approach makes an important assumption that wages and salaries are equal to marginal productivity, in other words differences in the productivity of people are reflected in the earning differentials of the people; and the existing differential rate of earnings will not change in future.

Advantages

6.6.4. One cannot easily separate the influence of various factors on earnings. But then we need not dismiss the estimates simply as 'Coefficients of ignorance'. It is extremely difficult no doubt, to isolate the influence of education on earnings. But of the several factors that exercise influence on earnings, education alone, it should be noted, emerges as "the single most powerful determinant of family income".[7] Yet we can attribute some percentage of income to factors other than education and arrive at near realistic estimates.

6.6.5. The interesting point to be noted is that in spite of all these drawbacks, it is extensively used for it provides us with 'a signal of direction: invest more or less' [8] though 'not statements of actual amounts to aim at'.[9]

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7. M.Blaug; The Rate of Return to Education in Great Britain Manchester School of Economic & Social Studies, XXXIII, 3(Sept). p.214.
8. M.Blaug: Approaches to Educational Planning, in Economic Journal, LXXVII, 306 (June), p.268
9. M.Blaug: Over Expension of Higher Education in Less Developed Countries and its Remedy, in Y.Ramati (ed.) Economic Growth in Developing Countries--Material and Human Resources, Praeger Publishers, New York, Washington: London. p.469.

The Model

6.6.6. The model used in the present study is given below :

$$\sum_{a}^{t=59} \frac{E_t - C_t}{(1+r)^{t-a}} = 0$$

where, C_t is the cost to society or to the parents for acquiring a particular level of education and E_t is the net earnings to the individuals as a result of that particular level of education, that is, the excess of earnings accrued for a particular level of education over the lower level of education. 't' is the age in question. 't' will be equal to 6 for the starting of the primary education. On completion of 60 the man is assumed to retire. Therefore terminal 't' is taken to be 59. 'r' is the internal rate of return. 'a' is the age of commencing a particular level of education.

Rates of return

6.6.7. The rates of return for different levels of education calculated by choosing such a value of 'r' (which is obtained by the process of iteration) which equates the present value of net benefits to 0 (i.e.) using E-C = 0.

Unit costs of primary education

6.6.8. As detailed in the section on factor cost of education, the unit cost of private and social costs are computed. Due care has been taken to see that total opportunity cost is used as the basis for finding unit costs. The usual unit costs given in educational statistics

refer to unit government expenditure for that level/ type of education. For purposes of cost benefit analysis of an investment, however, it is necessary to define costs in terms of the total opportunity cost of a project, that is, all real resources that are used up by the project. These are called the 'opportunity cost' since every investment represents the sacrifice of alternative opportunities to use the resources, either for present consumption or for some other form of investment. Thus money expenditures are significant only because they represent the purchase of teachers' labour, school buildings and equipment, or other goodsand services which have alternative uses. At the same time the educational system uses up other resources which have alternative uses, even though they are not reflected in normal expenditure on education.[10]

Private Unit Costs of primary education in Tamil Nadu

6.6.9. By dividing the estimated total factor costs as estimated in Chapter III by the corresponding number of pupils in each level, the unit costs have been computed. The following table shows the private unit costs and their components for their primary and higher primary levels of education.

TABLE VI-12

PRIVATE UNIT COST OF PRIMARY EDUCATION TAMIL NADU,1970-71
(Per year)

S.No.	Item	Higher primary	Lower primary
1.	Fees ..	—	—
2.	Non-fee costs		
	(a) Books and stationery ..	10.77	21.00
	(b) Other items ..	17.92	25.84
3.	Opportunity cost ..	39.41	430.77
4.	Total cost (100% earnings foregone) ..	68.10	477.61
	50% earnings foregone ..	48.40	262.23

6.6.10. In private cost of education, stagnation is a major factor which increases the private cost of education. It is assumed that the mean percentage of stagnation for lower primary level is 12.8. This is based on the stagnation indices worked out in Public Instruction Report for the year 1965-66 (which is the latest available printed report of educational statistics). The same rate is assumed for higher primary level also as exact state level particulars are not available for lower primary level. Applying the stagnation index, we arrive at the following adjusted private unit costs of primary education:

	At 100 percent earnings foregone	At 50 percent earnings foregone
Lower primary level ..	Rs 76.82	Rs 54.60
Higher primary level ..	Rs 538.74	Rs 295.80

TABLE VI-13

INSTITUTIONAL UNIT COST OF PRIMARY EDUCATION IN TAMILNADU

Item		Lower primary	Higher primary
Current cost	..	72.63	124.34
Capital cost	..	17.30	17.30
Net, Scholarships minus fees	..	.03	.28
Total	..	89.90	141.36

Social unit costs

6.6.11. Social unit costs are computed, making use of the estimates for private and institutional costs by excluding fees and scholarships components as they form transfer items. The social unit costs are shown in the table VI-14.

TABLE VI-14

SOCIAL UNIT COST OF PRIMARY EDUCATION IN TAMIL NADU

Item		Lower primary	Higher primary
Current cost	..	72.63	124.34
Capital cost	..	17.30	17.30
Non-fees :			
(a) Books and stationery	..	10.77	21.00
(b) Others	..	17.92	25.84
Income foregone	..	39.41	430.77
Total cost (100% of earnings foregone		158.03	619.25
50% earnings foregone		138.33	403.87

6.6.12. As stagnation increased the private cost of education, wastage in education in the form of stagnation and dropouts absorbs considerable resources. Narbergar, Pathari and Nalla Gounden ignored the wastage in Indian Education. Blaug and Pandit took note of the obnoxious problem of wastage and stagnation in the different levels of education. Pandit increased the private units costs of education by the average stagnation period in respect of each stage of education and he adjusted the social unit

costs of education for wastage (dropout and stagnation).[11] The class-wise mean percentages of wastage over the period 1957-58 to 1970-71 as given in the Perspective Plan for Tamil Nadu are:[12]

I to II classes	..	24.8
II to III classes	..	11.5
III to IV classes	..	9.6
IV to V classes	..	6.8

6.6.13. Multiplying by weightage 1, 2, 3 and 4 representing the number of years studied, the mean percentage of wastage per year for lower primary level works out to be 21.2.

6.6.14. The social unit cost after adjusting it for wastage works out to be 191.53 percent (for 100 percent of earning foregone). The adjusted social cost for 50 percent of earnings foregone for lower primary level is Rs 167.66.

6.6.15. At higher primary level, the percentage of crude wastage is nearly 20 percent. If weightage for number of years studied is given the mean weighted percentage of wastage will work out to 30 percent. Applying this percentage, the adjusted social costs are Rs 805.03 at 100 percent and Rs 525.02 at 50 percent of earnings foregone.

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11. M.N.Pandit: Investment in Indian Education size, sources and effectiveness, UNESCO, IIEP, 1976. p.42

12. Towards A Learning Society, State Planning Commission, Tamil Nadu, Madras-5. p.8.

Earnings—Principles of measurement of benefits

6.6.16. To evaluate education as an investment we need a measure of education's expected contribution to future levels of income or output. The obvious way in which education contributes to future income is by imparting skills and knowledge to educated manpower, thus improving the productivity of labour. If the productivity of educated workers is higher than that of the uneducated, this will be reflected in increased output and in higher earnings for the educated. We, therefore, need an estimate of the additional lifetime earnings of educated workers. Ideally, these data should be collected by comparing the earnings of educated with uneducated workers over their whole working lives. The total lifetime earnings differential would then provide an estimate of the higher productivity of the educated.

Time series data Vs Cross-section data

6.6.17. Unfortunately, no country has time-series data on the earnings of samples of educated and less educated workers and the collection of such data would take at least forty years. The standard way of measuring benefits is, therefore, to use cross-section data to estimate average age-education-earnings profiles for workers with different levels of education.

6.6.18. Table VI-15 shows the cross-section data of mean annual earnings of persons according to their age and qualification. This was collected from the Directorate of Statistics, Madras, where it was computed from the records of the National Sample Survey which was conducted in 1970-71 in Tamil Nadu. Care was taken to omit persons who had income from sources other than employment. The

TABLE VI-15

CROSS-SECTION DATA OF MEAN ANNUAL EARNINGS BY EDUCATIONAL LEVEL, TAMILNADU STATE 1970-71

Age	Illiterate		Passed V Standard		Passed VIII Standard	
	P	E	P	E	P	E
1	2	3	4	5	6	7
10-14 ..	2,363	249.5	1,100	365.0	-	-
15-19 ..	16,273	699.2	12,065	1085.6	6,243	656.8
20-24 ..	28,766	847.4	39,586	1084.7	23,900	735.0
25-29 ..	70,993	1003.1	61,420	1528.6	69,780	1408.5
30-34 ..	49,406	920.4	41,140	1383.2	57,463	2292.3
35-39 ..	74,625	991.0	72,583	2181.0	39,420	2047.7
40-44 ..	67,240	945.09	37,540	1464.2	35,940	2259.1
45-49 ..	107,476	1390.0	47,068	1801.3	36,320	1544.5
50-54 ..	33,355	771.2	36,440	1561.5	12,160	3424.0
55-59 ..	18,326	742.1	1,100	1094.9	1,520	1200.0
60 and above ..	29,978	773.8	1,100	521.4	12,160	720.0

P = Persons; E = Mean annual earnings in rupees

Source : Data collected from the Directorate of Statistics, Madras

sample included large number of persons from all sectors of industry. The sample included 4,98,801 illiterates, 3,51,142 persons who had passed V Standard and 2,93,906 persons who had passed VIII Standard.

6.6.19. This sample survey is a comprehensive one and covers all levels of education including graduates and post-graduates. Only the relevant portions of the survey data (relating to primary level) are utilised here for the study. From the basic survey data, the number of persons under each category and the total amount of earnings were worked out first. From this the mean annual earnings for each category was got by dividing the total earnings by the number of persons.

6.6.20. Figure-IV shows the age-education-annual earnings profile for illiterates, lower primary and higher primary passed persons.

Rates of return on primary education in Tamil Nadu

6.6.21. On the basis of the costs in which 50 percent of earnings foregone is included and earnings computed, the rates of return for Tamil Nadu are worked out as shown in table below.

TABLE VI-16

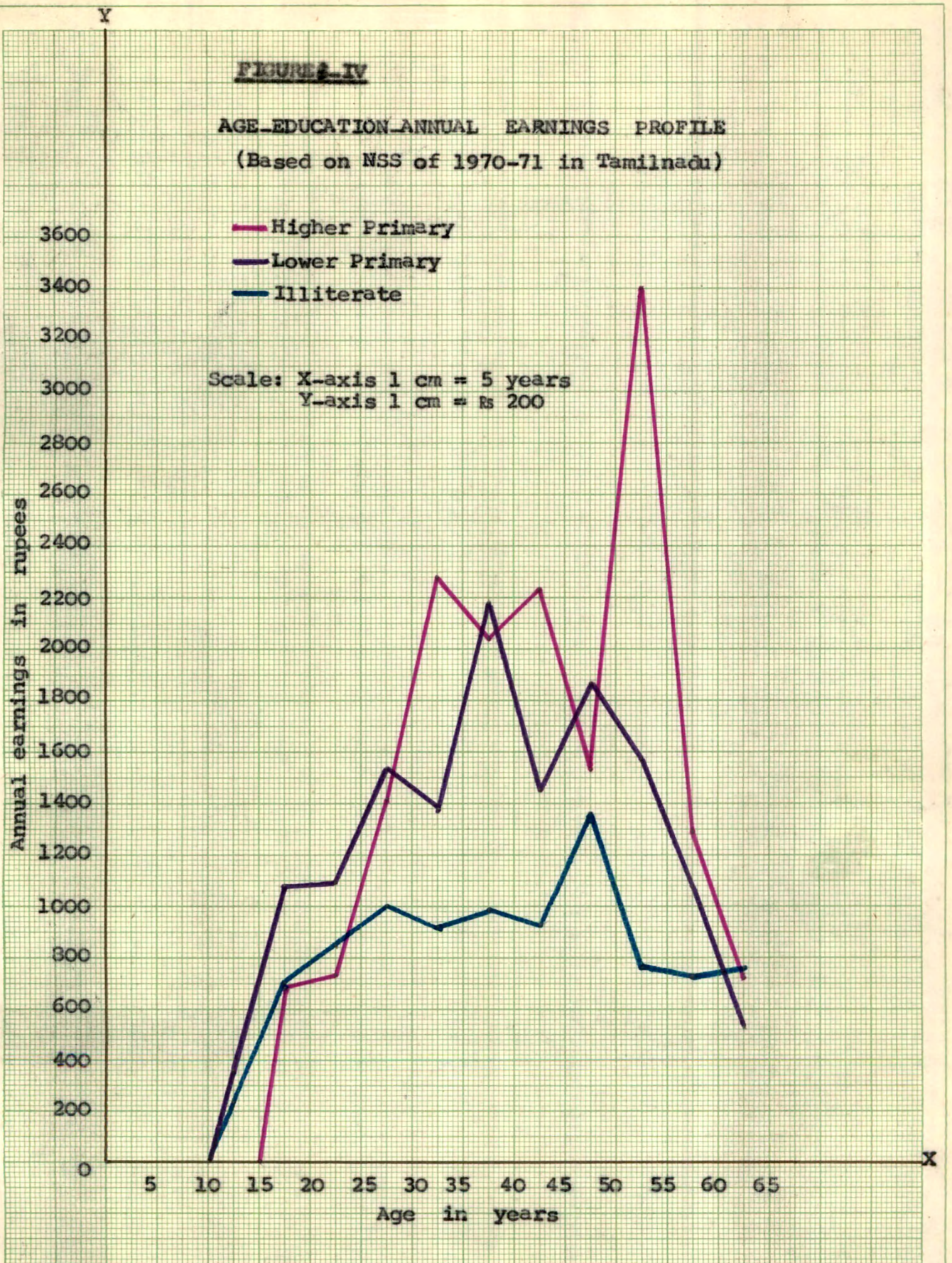
RATES OF RETURN ON PRIMARY EDUCATION IN TAMILNADU(1970-71)

Qualification	Years	Rates of return	
		Private	Social
Lower primary education over illiterates ..	5	39.6	22.4
Primary education over illiterates ..	8	14.2	11.1

FIGURE 4.IV

AGE-EDUCATION-ANNUAL EARNINGS PROFILE

(Based on NSS of 1970-71 in Tamilnadu)



Findings

6.6.22. (i) The social rates of return are less than the private rates of return as the Government shares the major portion of education expenditure at primary level. This is because in addition to earning foregone which is a common factor in both private and social costs, institutional costs constitute a major item and it is met by the Government/Society.

(ii) The difference in social rates of return over private rates of return is higher for lower primary level (17.2) than it is for complete primary level (3.1).

(iii) The rate of return is greater in respect of lower primary level (5 years of schooling) than in the case of VIII Standard completers (8 years of schooling). The rates in respect of lower primary level are much less because the earnings foregone at higher primary level constitute a major part of costs whereas the earnings of the VIII Standard passed persons are not commensurably greater when compared with the earnings of V Standard passed persons. This may be the reason for convergence in the educational pyramid at the higher primary level and above.

(iv) The difference of private rate of return of complete primary education over the rate for lower primary level is 25.4. Such difference in respect of social rate of return is only 11.3. The private rates of return decreased more steeply than the social rate of return and hence the difficulty in improving enrolment at higher primary level and in attaining the universalisation of primary education up to VIII Standard.

(v) If the normal bank rate is considered as 6 percent, the rates of return in respect of lower primary level are more profitable than the rates for complete primary level.

(vi) If adjustments for rates of participation, unemployment and mortality rates are made, both private and social rates of return will be reduced correspondingly.

(vii) It is assumed here that all the earning differentials are due to education. If a factor is used to deflate the earnings for other attributes like native ability, endowed intelligence, achievement drive, social class origin, education of parents etc., the rates of return will be reduced correspondingly.

The effects

6.6.23. Our investigations in the field of masonry workers, cement labourers and rural farmers etc. have established the existence of a nexus between literacy and productive ability leading to improved earnings. In addition, we have also traced aspects of correlation between educational levels and better social awareness to welfare schemes like family planning etc. We have also found out that the quality of work increases along with educational levels which provide incidentally for hikes in the ladder of promotional opportunities. We have also for the first time made an investigation using available Indian data to prove that there is positive correlation between the modern-traditional sector-wage differential and educational demand.

6.6.24. We find a kindred soul in the Secretary of the Board of Education of Massachusetts about whom H.Mann

speaks eloquently in his Fifth Annual Report covering a period as early as 1841.[13] "With astonishing prescience, the secretary of the Board of Education of the State of Massachusetts proceeds in the last section of this report to demonstrate 'the difference in the productive ability—where natural capacities have been equal—between the educated and the uneducated'. He reproduces a number of letters from businessmen, testifying to the superior productivity of educated over uneducated workers in similar occupations, and, in addition, touches on most of the now familiar 'indirect benefits' of education."

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13. M.Blaug: Economics of Education, PergamonPress, New York, 1970. p. 6.