

**CMDR Monograph Series No. - 2**

**RURAL-URBAN INEQUALITIES  
IN  
EDUCATION**

**A study on returns to education, human capital formation  
and earnings differentiation**

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## ABSTRACT

The general presumptions are : (a) the economic returns to investment in education of rural masses are relatively less compared to those of urban workers and hence any public subsidization of education of rural workers can be supported only on non-economic grounds like social justice; (b) the rural households tend to invest less in the education of their children as they fail to recognize the benefits of education and or as they cannot afford to invest in a long gestation period sector like education; and (c) there exist large earnings differentials between rural and urban workers. All these presumptions are open to question. Based on data collected through a sample survey

of the west Godavari District of Andhra Pradesh in South India, the above hypotheses have been examined in this paper. The study rejects the first hypothesis and establishes that rates of return to education of rural workers are generally higher than the returns to urban workers, and that investment in education in rural areas is as justified as in urban areas from economic efficiency point of view. The study, without exactly verifying into the factors behind, confirms the latter two hypotheses.



## **PREFACE**

The center for multi-disciplinary development research (CMDR) is a social science research institute in a moffusil area of Karnataka and is sponsored by the Indian council of social science research, New Delhi. The center aims at undertaking analytical studies of conceptual and policy significance on the socio-economic and cultural issues using multi-disciplinary perspectives and state level and micro level information.

As a part of its publication programme, the center has initiated a CMDR Monograph series, consisting of both invited contributions and the research studies completed at the center.

We are happy to present the second in the monograph series under the title 'Rural-Urban inequalities in Education' written by Dr.J.B.G.Tilak. In this study, Dr, Tilak has brought out different aspects of rural-urban inequalities in education in India, particularly, focusing his attention on costs

and returns to education in rural and urban areas. The conclusion based upon the rural-urban differentials in return to education highlights the need for the development of educational opportunities in rural areas. This conclusion must be considered as providing a useful analytical ways for the education policy making in the country. The educational activities need to be developed in rural areas, in moffusil, urban and small towns, in addition to the policy focus of educational opportunities in urban and metropolitan areas .

CMDR expresses its thanks to Dr. J.B.G. Tilak for contributing a useful analytical paper to the CMDR monograph series.

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Development Research*

25-2-1992

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# RURAL URBAN INEQUALITIES IN EDUCATION

## A Study on Returns to Education, Human Capital Formation and Earnings Differentiation

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JANDHYALAB.G.TILAK

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*“The most important class conflict in poor countries of the World today is not between labour and capital. Nor is it Between foreign and national interests. It is between the Rural classes and the urban classes.”*  
(Lipton,

1977, P.1)

### 1. INTRODUCTION :

Indian economy is predominantly rural. According to 1981 census, 76.3 percent of country's population lives in rural areas. Rural-urban inequalities in the quality and quantity of education are quite striking.<sup>1</sup> Only 29.6 percent of the rural population are literate as against 57.2 percent of the urban population according to the 1981 census. In 1977-78 while 50.8 percent of the rural population live in poverty, the corresponding figure for urban population is 38.2 percent. There are large disparities in income and expenditure patterns. For example, a matriculate might expect to earn over 43 percent more in urban than in rural areas, and an urban graduate three times more (Lipton, 1977, p.262) similarly the average per capital

monthly expenditure is Rs.53 in rural area, while in urban areas it is nearly one and a half times higher (CRB, 1981). In 1960-61, One in eight matriculates and graduates living in rural areas was jobless, as against one in sixteen in towns (Baugh et al., 1969, pp. 69-70).

These figures are only indicative of the vast differences between rural majority and the urban minority in India. In this study it is proposed to analyze a few dimensions of inequality in depth. Particularly the following hypotheses are examined :

- (a) Internal rates of return to education in urban areas exceed those in rural areas.
- (b) There exists inequality in human capital formation between rural and urban areas, the distribution being skewed against the former.

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1. See Tilak and Chaudhri (1982)

- (c) There also exists wide inequality in earnings between rural and urban workers.

These hypotheses are obviously not completely independent of each other. Study of the latter two hypotheses would provide some sort of explanation to inequality in rates of return to education, as human capital is mainly assessed in terms of costs of education, while the latter is concerned with inequality in earnings. Further, these two aspects themselves constitute important aspects worthy of study. For instance, if wage differentiation reduces rates of return to education and persists in a severe form, education may prove to be a poor instrument of achieving equality (Thorpe, 1968), and calls for policies which ensure wage equality. Similarly study of human capital formation may highlight some of the dimensions of historical malinvestment in the education of rural people. The study is based mainly on the data collected through a sample survey conducted by the author in the West Godavari District of Andhra Pradesh, in the context of another study (Tilak, 1987)<sup>2</sup> the rest of this paper is organized as follows : The following section contains a brief note

on the data. Sections 3, 4 and 5 are devoted to verifying the three hypotheses mentioned earlier respectively. Finally in section 6 a brief summary and conclusions have been presented.

## 2. THE DATA :

This study is based on a survey of educational characteristics and earnings in West Godavari District of Andhra Pradesh in India, 1977 and in 1978. The sample included one town and a village from each of the eight taluks of the district. In selecting the villages an attempt was made to ensure that the village was representative of the taluk in respect of educational development. In each of the selected villages and in the town two percent of the households were selected randomly.<sup>3</sup> Basic socio-economic information was collected from a total of 415 households, 381 in the primary phase and 34 in a supplementary phase, by completing a pretested and revised questionnaire for each household. This was done through interviews with the head of the household. If he/she was unavailable for some reason, the senior most member of the household who could be found was interviewed. The

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2. Tilak (1987) analysed similar aspects covered here, but concentrated on male-female inequalities, and inequalities between backward castes and non-backward castes.
  3. Such a sample design may not be inappropriate in our context. For instance, Mahalanobis (1952) observed that when the frame consists of only a list of units and nothing else, whatsoever, is known about the field the problem of sample design reduces to the simple case of selecting for investigation a suitable number of elementary units in a random manner so that valid inferences may be drawn from the sample by appropriate methods. It is only when some previous information, which may be only approximate in nature is available about the field that the problem of sample design becomes important.



survey covered 207 rural and 203 urban households.

The district surveyed, was representative of Andhra Pradesh, in terms of educational development (Tilak, 1982, and 1984). Thirty eight percent of the population in the district were literate. Although in terms of economic development, the district is relatively more advanced, the distribution of income in the district is not very different from that of the state as a whole (NCAER, 1962; and Sastry, 1978).

### 3. INEQUALITY IN RETURNS TO EDUCATION :

There are a few major studies on rates of return to education in India.<sup>4</sup> But no study has so far paid any attention to the problem of unequal returns to education between rural and urban population. On the other hand, many studies deliberately ignored the rural society and were confined to urban population only.<sup>5</sup> But educational levels, earnings and related aspects like employment, violently vary between rural and urban areas in India, as in many other countries. Nevertheless, this aspect did not receive any attention of the researchers. The unequal returns to education between rural and urban areas may not be

adequately revealed in any comparison of average rural and urban incomes (Byerlee and Eicher, 1972). A study on unequal returns to education is expected to shed some light on income inequalities as well as on several other important related dimensions.

The present study can be seen as a modest attempt in this direction. It estimates internal rate of return to education in rural and urban areas, separately and analyses the inequality between them. To verify the first hypothesis, the familiar method of internal rate of return to education has been adopted, which is described briefly as follows :

The internal rate of return to education ( $r^*$ ) can be determined by solving the following equation :

$$\sum_{t=s}^n [(B_t - C_t) / (1+r^*)^t] = 0 \dots \text{Eqn. 1}$$

where B represents benefits,<sup>6</sup> C the costs of education, t the time period ranging from s the age at which education of the concerned level commences, to n the age of retirement, i.e., n-s being the working life of the individual, including the years of schooling. Briefly, the method involves

(a) construction of age-earnings profiles by

4. See Tilak (1987) Chapter 4 for a review of studies on Indian Education.

5. An analysis of research in the world countries also leads to a similar conclusion. See Schultz (1973).

6. In the literature, as well as in the present study, the earnings of the individuals are treated as the sole economic benefits of education.

- levels of education
- (b) estimation of costs of education,
  - (c) estimation of the internal rate of return, and
  - (d) finally, adjusting the internal rate of return for various factors.<sup>7</sup>

### 3.1 Age-Education-Earnings Profiles :

Age-earnings profiles by levels of education have been prepared separately for the rural and urban workers, based on the household survey. It may be noted that our sample consists of 500 members in rural workforce and 166 members in urban work force. The total of 966 includes 288 women and 678 men. However, we have not further classified the sample into rural males/females and urban males/females, as the size of the sample in each would be further small. The sample includes workers belonging to a variety of occupational categories, both private sector and government sector, and both formal and informal sectors. The sample could not be classified by industry-occupation categories, essentially because of the small size of the sample, even though such an attempt would

further highlight the inequalities. The sample workers have been first classified into rural and urban categories, depending upon the place of their work. The each sub-sample was cross-classified by education and age-group : into eight educational levels, starting from illiteracy to the higher professional levels, and 12 age-groups starting from 8-10 to 56 plus.<sup>8</sup> The age-earnings profiles are presented in Table 1 and their main characteristics are outlined in Table 2. Their graphic presentation in Figures 1 and 2 separately for rural and urban workers, makes a few points very clear. It can be seen that our profiles more or less correspond well to the characteristic features of 'well-behaved' age-earnings profiles, showing (i) positive correlation between education and earnings (ii) an increase in the earnings with increase in age up to a peak and then showing a decline, (iii) steeper profiles for higher educated compared to less educated and (iv) higher age at which earnings reach their peak for higher levels of education.<sup>9</sup> Further, it may be noted that our profiles in general are comparable with the profiles derived from other samples in India,<sup>10</sup> and the profiles encountered in other countries.<sup>11</sup>

7. See Psacharopoulos (1973) for a full description of the method. Readers interested in the limitations of the method and its defence may refer to Blaug (1967a), and for a recent discussion on related issues see Barrios and Davis (1980), and Tilak (1981a).

8. Age of exit from the working life has been assumed to be same across levels of education, and across the rural-urban divide, which may not necessarily be true. See Sundaram (1976). Hence, it may result in a margin of error to that extent in the discounted value of life-time earnings. But the margin of error may not be significant, as the value of earnings at the age of say 50, when discounted, turns to be very small and so negligible that it may not have any effect on the estimated rate of return.

However, we can note that except at the middle and higher professional levels, the average life time earnings of the urban workers exceed the corresponding profiles of the rural workers at every level of education. At the middle and higher professional levels, however the rural urban differences in the profiles are not very large.

When we look at the peak earnings in Table 2 (Column 3), we notice that earnings in rural areas are higher than in urban areas at higher general levels of education. The ratio of peak earnings to average life time earnings, which may highlight intra-group inequalities in earnings by educational levels, also show more or less similar pattern. The age at peak earnings by educational levels, also show more or less similar pattern. The age at peak earnings is lower for urban workers than for rural workers at all levels of education except to those with secondary and higher general levels of education. The ratio of average life-time earnings of a given level of education to the average life-time earnings of the illiterates is less at every level of education, except the middle level, in rural areas, than in urban areas. This confirms the well established hypothesis that "Income in poor countries is usually more equally distributed within the rural sector than

within the urban sector" (Ahluwalia, 1974: and Lipton, 1977).

However, interestingly the slopes of the profiles in the Figures 1 and 2 make it clear that except at the lower level of education at which the slopes of the profiles both in rural and urban areas are equally flat, the earnings profiles of rural workers are steeper at higher levels of education than those of urban workers indicating that the earnings of rural workers with higher education grow at a faster rate than those of the urban workers.

The age-earnings profiles no doubt exhibit some anomalies, even though on the whole they are 'well-behaved', i.e., low earnings up to a peak in middle life and then lower earnings afterwards. More importantly the height of age-earnings profiles varies according to the educational level, with successive upward shifts in the profiles being associated with higher and higher levels of education. Higher educational levels do not necessarily result in an upward shift of the profile uniformly for all relevant age groups, resulting sometimes in inter-locking of the profiles. They also exhibit several 'loops' in between, i.e., earnings decline even in transitory age-group, eg., E3, E4, and E5<sup>12</sup>. In rural areas between age-groups

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9. See Blaug et al (1969, p.172)

10. See Tilak (1987) Chapter 4, and also Pandit (1972).

11. See Hansen, ed., (1967) for details on several profiles with respect to the United States, England, Latin America, Blaug (1971) for Thailand, Thias Carnoy (1972) for Kenya, Psacharopoulos (1988) for Brazil, and Woodhall (1987) for a review of some of these profiles.

Table 1  
**AVERAGE AGE-EDUCATION-EARNINGS PROFILES**  
**UNADJUSTED, BEFORE TAX**  
**(Rs. Per annum)**

		Educational Levels					
		E <sub>0</sub>	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	E <sub>4</sub>	E <sub>5</sub>
<b>Rural</b>							
	8-10	153	--	--	--	--	--
	11-13	210	222	240	--	--	--
	14-18	480	600	609	800	960	--
	19-21	712	800	1166	972	2016	2180
	22-25	780	1363	1975	2618	2648	3191
	26-30	850	1600	2198	3830	3905	5223
	31-35	1325	1800	2451	3679	4399	5276
	36-40	1375	2356	2562	4172	4877	5463
	41-45	1364	2561	2750	4082	4532	5119
	46-50	1480	3587	3317	4174	4059	7080
	51-55	1369	961	2147	3611	4638	6000
	55 +	1027	1485	2157	3626	2050	2020
	All Age Groups	1106	1813	2222	3715	4068	4963
<b>Urban</b>							
	8-10	283	--	--	--	--	--
	11-13	251	280	360	--	--	--
	14-18	519	600	1051	1120	1700	--
	19-21	687	1200	1840	2300	1882	1440
	22-25	1232	800	1255	1860	3312	4449
	26-30	1250	2120	2080	3997	4948	5487
	31-35	1600	2250	3486	3339	4518	5772
	36-40	1425	2680	4368	4443	4985	6464
	41-45	1133	4175	4467	3656	5077	6887
	46-50	1199	1600	1644	2960	5082	8640
	51-55	1369	2169	2825	2543	5180	4800
	55 +	1386	1560	2350	4284	2040	4082
	All Age Groups	1001	1997	2722	3311	4354	5616
		(32)	(19)	(43)	(52)	(115)	(54)

Cont'd ..

Table 1 Cont'd  
**AVERAGE AGE-EDUCATION-EARNINGS PROFILES**  
**UNADJUSTED, BEFORE TAX**  
**(Rs. Per annum)**

	Educational Levels					No. of Persons
	E <sub>6</sub>	E <sub>7</sub>	E <sub>8</sub>	E <sub>9</sub>	All	
<b>Rural</b>						
8-10	--	--	--	--	153	3
11-13	--	--	--	--	224	7
14-18	--	--	--	--	731	9
19-21	--	--	--	--	1391	21
22-25	4803	5232	4857	9227	2790	36
26-30	5498	5670	5547	10200	3917	76
31-35	6380	7356	6705	9800	4424	71
36-40	6434	6900	6538	15126	4406	79
41-45	11508	7320	10910	21200	4376	74
46-50	18000	12200	15100	29343*	4339	49
51-55	7424	9600	7968	15484*	3353	35
55 +	4200	5431*	4508	8760*	1762	35
All Age Groups	6850 (43)	7046 (14)	7054 (57)	14005 (5)	3645 (500)	500
<b>Urban</b>						
8-10					283	3
11-13					285	9
14-18					1262	12
19-21					1602	14
22-25	4597	5925	5059	12000	3933	60
26-30	7195	7507	7324	10590	5664	87
31-35	7604	8782	8012	9660	5829	75
36-40	10410	11784	11299	16040	7419	64
41-45	8052	13200	8520	17000	6134	50
46-50	9000	12200	10610	16200	6132	32
51-55	11100	14053	12872	9500	5709	27
55 +	6410	9828	7549	11600	4817	26
All Age Groups	7219 (75)	9392 (50)	8139 (125)	13032 (25)	5380 (466)	466

Note : \* Estimated on the assumption that the ratio between the earnings of the given age group and its preceding age group is the same as that of the preceding educational level of the corresponding age group.

Figures in parentheses are number of persons.

FIGURE 1  
 AVERAGE AIR-RESOLUTION-READING ERRORS (PERCENT)  
 WITH AGES

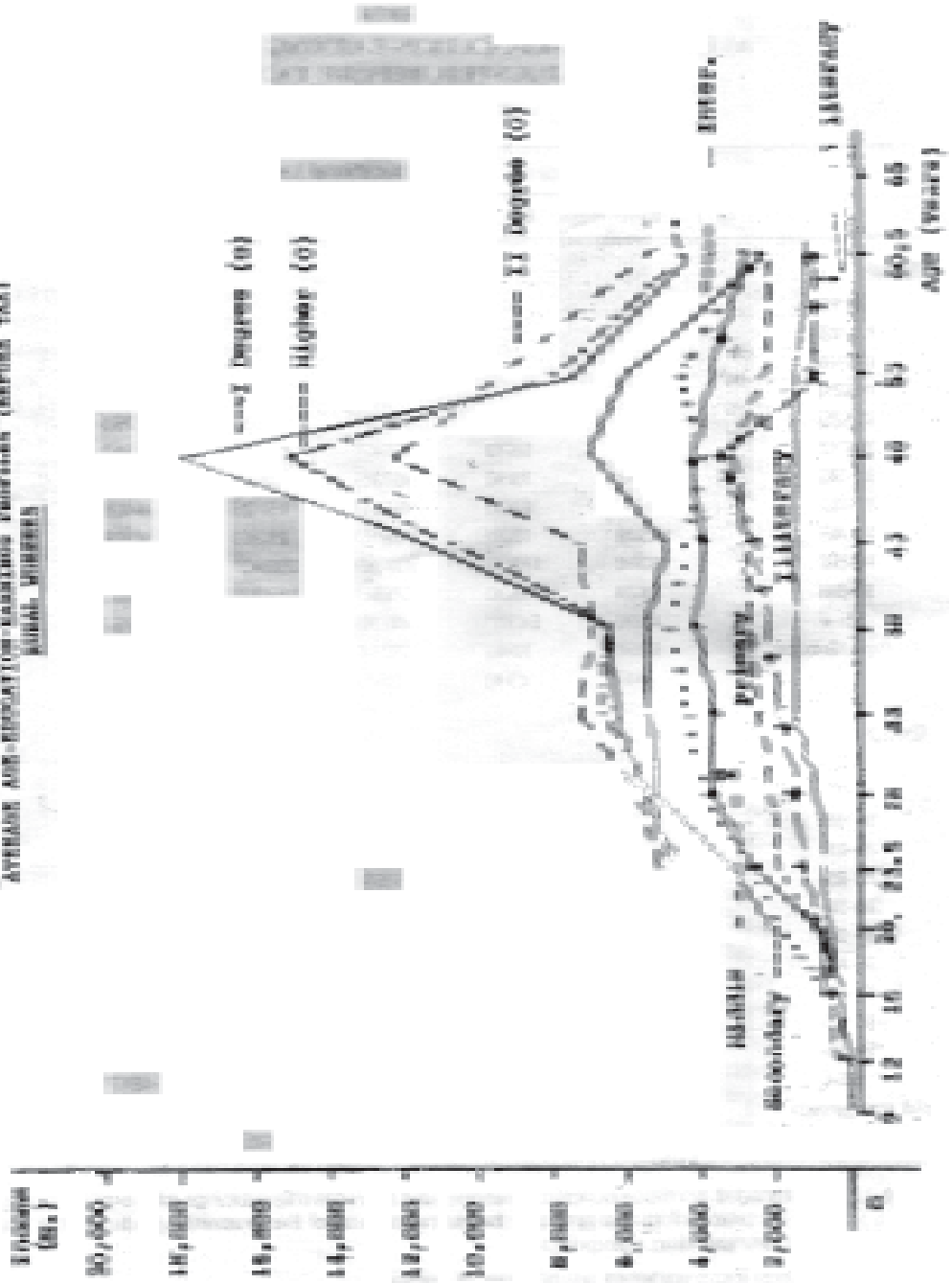


Figure 6  
 AVERAGE AGE-EDUCATION-RELATED PROFILES (RURAL-URBAN  
 DIFFERENCES)



35-40 to 41-45, and then rise. In some cases, there is some degree of inter-locking of the earnings profiles corresponding to different levels of education. Further, the difference between the rural and urban profiles do not show any systematic pattern either by levels of education, or by age groups. These anomalies are difficult to explain. However, they may be due to relatively small number of observations in the sample. One can expect a large sample to produce 'perfect' profiles.<sup>13</sup> At the same time, it may be noted that such anomalies are not uncommon in the literature.<sup>14</sup>

Here the age earnings profiles up to the First Degree general education level only are used while estimating internal rate of return to education in rural areas, as there exist few post-graduate centers, not to speak of universities in rural areas, and accordingly costs of post graduate and higher professional education in rural areas cannot in rural areas cannot be estimated.<sup>15</sup>

### 3.2 Costs of Education :

Costs of education consist of two important components: private and institutional. Private cost is defined as that part of the investment in education which is

incurred by the pupil and/or by his parents or guardian. Private cost is composed of three major items : (i) tuition cost, (ii) non-tuition costs, i.e., maintenance cost, also known as foregone (iii) opportunity cost, also known as foregone earnings, that would have been earned had the pupil stayed outside the school. In contrast, the institutional costs consist of current as well as capital expenditure incurred by the institutions. The sum of private and institutional costs, net of transfers such as fee paid by the students and scholarships received by them, constitutes the total social costs of education.<sup>16</sup>

The private expenditure on education and foregone earnings have been computed here on the basis of the sample survey.<sup>17</sup> and the age-earnings profiles based on it. The sum of the private expenditure and foregone earnings gives us the private cost of education. Institutional costs of education are estimated on the basis of the data collected from several published and unpublished records of several sources.<sup>18</sup> Both private as well as social costs of education have been computed separately for rural and urban areas and presented in Table 3. It is clear from this table that private as well as social investments in

12. See Appendix for notation.

13. These anomalies may also be due to several factors in the economy such as the supply and demand factors. See Blaug (1967b). But such interpretations would be meaningful, if the size of the sample does not form a constraint.

14. For example, see Thias and Cornoy (1972), Blaug (1971), Freeman (1976), Blaug et al (1969), etc.

15. In the district where the survey was conducted, no institution for post graduate education existed.



Table 2  
**COMPARATIVE CHARACTERISTICS OF AGE-EDUCATION-EARNINGS  
 PROFILES**

	Peak Earnings Rs.	Age at Peak Earnings	Average Life Time Earnings Rs.	Ratio of cols Cols. 2 to4	Ratio of Average Life time Earnings to those of Illiterates
(1)	(2)	(3)	(4)	(5)	(6)
<b>Rural</b>					
Illiteracy	1480	48	1106	1.34	1.00
Literacy	35587	48	1813	1.98	1.64
Primary	3317	48	2222	1.49	2.01
Middle	4174	48	3715	1.12	3.36
Secondary	4877	38	4068	1.20	3.68
Intermediate	7080	48	4963	1.43	4.49
I Degree (Gen.)	18000	48	6850	2.63	6.19
II Degree (Gen.)	12200	48	7046	1.73	6.37
Higher (Gen.)	15100	48	7054	2.14	6.38
Higher (Prof.)	15484	53	14005	1.11	12.66
All Levels	4424	33	3465	1.21	3.30
<b>Urban</b>					
Illiteracy	1600	33	1001	1.60	1.00
Literacy	4175	43	1997	2.09	2.00
Primary	4467	43	2722	1.64	2.72
Middle	4443	38	3311	1.34	3.31
Secondary	5180	53	4354	1.19	4.35
Intermediate	8640	48	5616	1.54	5.61
I Degree(Gen.)	11100	53	7219	1.54	7.21
II Degree(Gen.)	14053	53	9392	1.50	9.38
Higher (Gen.)	12872	53	8139	1.58	8.13
Higher(Prof.)	17000	43	13032	1.30	13.02
All Levels	7419	38	5380	1.38	5.37

education per pupil is less in rural areas than in urban areas at every level of education. The private cost of primary education per pupil in urban areas is more than double to the cost in rural areas. While at middle, secondary and intermediate levels the cost of education is about 1.5 times higher in urban areas than in rural areas, at First Degree general level it is 10 times higher in urban areas. Higher education is a privilege of a few in general and more in case of rural areas. Only the relatively wealthiest can afford to go to colleges in rural areas. When the wealthiest go to colleges, initially they might spend huge expenditure on education, substantial part of which might be conspicuous consumption, necessary for cultural and status needs. As some feel, "education is increasingly becoming an item of wider cultural consumption" (Kothari, 1967, p. 8), perhaps more so in the case of higher education in rural areas. As intermediate level forms the initial part of college education there is a sudden rise in the private cost of education in rural areas from Rs. 186 at secondary level to Rs. 700 in intermediate. However, the sudden decline in the costs at First Degree to Rs. 138 cannot be satisfactorily explained.<sup>19</sup>

The social costs also show similar wide differences between rural and urban education, even though the institutional cost is high in rural areas at lower costs of education. The lower costs of education in the case of rural areas may represent the lower quality of education, students in rural areas receive.<sup>20</sup>

Foregone earnings form a significant part of the private as well as social costs of education at every level of education in the case of either group. However, forgone earnings form a higher proportion of private costs in the case of rural students than in the case of urban students because of labour force participation rates are higher in rural areas than in urban areas particularly at lower age groups.<sup>21</sup> However, as a proportion of total costs, foregone earnings form a smaller part for rural than for urban pupils, due to significantly higher private expenditure on education on the part of urban classes.

The tendency to spend less on education on the part of the rural parents can be easily understood in terms of their relatively weaker economic positions, as reflected by the age-earnings profiles. The

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16. See Tilak (1985 and 1988) for more details on costs of education.

17. The survey also covered data on schooling expenditures on about 700 pupils, belonging to the same households, who were in schools at the time of the survey.

18. The sources are the Directorate of Education, Government of Andhra Pradesh, District Educational Office, West Godavari District, University Grants Commission, and the Ministry of Education, Government of India, New Delhi.

19. The sample consists of a relatively very small size of students at First Degree level in rural areas.

differences in these earnings profiles are reflected in foregone earnings. The foregone earnings are higher in absolute value for urban than for rural classes and so are the institutional costs.

### 3.3 Internal Rate of Return to Education :

Comparing the above discussed age-earnings profiles and costs of education, and estimating the Equation 1, first crude rates of return are arrived at. As these rates are based on several unrealistic assumptions, viz., (i) there is no wastage in education, (ii) the secular long-term growth in income is negligible, (iii) there is no unemployment, (iv) people live up to the end of their working life period, the original age-earnings profiles and costs of education are to be adjusted for a few factors to estimate adjusted rates of return. Accordingly the following adjustments are made.

#### 3.3.1 The Adjustments :

The followings adjustments are made either to the earnings stream or to the cost stream to estimate refined rates of return to education.<sup>22</sup>

##### *i) Wastage in Education*

It is not certain that all the investment

made in education yields output. While one cannot hope unforeseen uncertainty, uncertainty which is predictable with some measure of confidence, should be brought into the cost benefit calculus. Predictable uncertainty relates to wastage and stagnation in education, unemployment, non-participation in labour force and mortality.<sup>23</sup>

All the pupils who enter a particular level education may not come out of it in the form of 'finished' products within the 'normal' period. Some pupils may as well drop out from the system before they complete a particular level of education. Some pupils may not qualify in the final examination and may require more than 'normal' period to complete a given level of education. Hence it is necessary to adjust costs of education for such dropouts and failures. In this study, the unit costs of education are re-estimated, taking such wastage into account. Assuming that the dropouts and failures have no return on their investment in education,<sup>24</sup> the number of successful pupils is taken into account in place of number of enrollments.

The wastage rates together with other factors for which adjustment is made are presented in Table 4.

20. NCERT (1978) provides interesting statistics on the quality of school resources in rural areas, in contrast to urban areas. See also Lipton (1977, pp. 260-62) for a description of 'bad schools for ignorant rustics'. See also Tilak and Chaudhri (1982).

21. See Tilak (1979c) for some general details on rates of labour force participation.

22. The rationale for these adjustments are discussed in greater detail by Psacharopoulos (1973 and 1975), and Tilak (1987) Chapter 5.

Table 3  
**PRIVATE AND SOCIAL COSTS OF EDUCATION**  
**(Rs. Per pupil per annum)**

	Private Expen- diture (1)	Foregone Earnings (2)	Total Private Cost (3)	Institu- tional Cost (4)	Social Cost (5)	Cols. (2)/(3) % (6)	Cols. (2)/(5) % (7)	Cols. (3)/(5) % (8)
<b>Rural</b>								
Primary	169.29	101.20	270.49	124.10	394.59	37.4	25.6	68.5
Middle	92.19	240.00	332.19	270.18	602.37	72.2	39.8	55.1
Secondary	186.31	800.00	986.31	333.43	1319.74	81.1	60.6	74.7
Intermediate	700.00	960.00	1660.00	478.54	2138.54	57.8	44.9	77.6
I Degree (Gen.)	138.33	1866.67	2005.00	478.54	2483.54	93.1	75.2	80.7
<b>Urban</b>								
Primary	398.65	167.20	565.85	80.47	646.32	29.5	25.9	87.5
Middle	818.08	360.00	541.08	262.15	803.23	66.5	44.8	67.4
Secondary	285.74	1120.00	1405.74	370.90	1776.64	79.7	63.0	79.1
Intermediate	1104.12	1700.00	2804.12	577.91	3382.03	60.6	50.3	82.9
I Degree(Gen.)	1387.19	1623.33	3010.52	577.91	3588.43	53.9	45.2	83.9
II Degree(Gen.)	2060.00	2821.50	4881.50	577.91	5459.41	57.8	51.7	89.4
Higher (Gen.)	3379.55	2102.60	5482.15	577.91	6060.06	38.4	34.7	90.5
Higher (Prof.)	4479.17	2151.80	6630.97	---	---	32.5	---	---

## *ii) Unemployment*

As the age-earnings profiles have been constructed on the basis of work force only, they need to be adjusted for unemployment.<sup>25</sup> Assuming that a major part of the incidence of unemployment is in the early years of working life, average waiting period by levels of educated labourers on the basis of data collected from the District Employment Exchange,<sup>26</sup> and during this waiting period, the earnings are treated to be zero.

## *iii) Non-Participation in Labour Force*

Voluntary non-participation in labour force constitutes wastage as far as investment in education is considered, calling for adjustments of either the earnings profiles or the costs of education. To make a precise adjustment, we require data on population, workers, unemployed (seeking employment), and non-workers by age and educational levels. But such data are not available in required details by rural urban break-up. Hence rates of participation are re-estimated by educational levels only. Using the Census data and the age-earnings profiles are adjusted downwards for non-participation in labour force.<sup>27</sup> It is to be

noted that the participation rates are calculated separately for rural population and urban population, each set including men women. These rates of participation are used to adjust the age-earnings profiles, though it would have been better had we estimated rates of participation separately for rural males and rural females, and urban males and urban females, as rates of participation by gender varies very significantly.<sup>28</sup>

## *iv) Mortality*

As reliable data on rates of mortality are not available by levels of education, and by rural-urban breakup, adjustment for this factor is not attempted here. However, this adjustment may result in significant variation in estimates of rates of return, only if there is a high mortality rate among the individuals of the age group 20-40 which is not the case in the state of Andhra Pradesh. After all, education reduces mortality (see Antonovsky, 1967). "In as much as educated people have lower mortality this adjustment does not seem to have a very significant effect on returns to education" (Barrios and Davis, 1980, p.93).

## *v) Growth in Incomes*

23. The former is known as internal wastage and the others constitute external wastage.

24. Some feel that this assumption is not true, and hence the use of 'cost per successful pupil' is not appropriate. See Kothari and Panchamukhi (1980, p.187) for details.

25. However, if census or sample surveys cover the unemployed also, and if earnings profiles are based on such total surveys, this adjustment is not required.

26. Information on employment situation was collected from the records of the District Employment Exchange, West Godavari District, relating to 518 applicants who were placed on employment during January 1978 to August 1978. All the applicants placed on employment during this period, the latest period for which data were available, were covered for this purpose.

In order to estimate rates of return to education, ideally we require data on life-time earnings of individuals by age and educational levels based on time series data,<sup>29</sup> in the absence of which the cross section data are used and are adjusted by a secular rate of growth of individual incomes. The cross-section age-earnings profiles do not truly represent the life time earnings profiles.<sup>30</sup> So the life time earnings are obtained by inflating the cross-section earnings profiles by a rate of growth of incomes.<sup>31</sup> In the present context the rate

of growth of per capital income in the state of Andhra Pradesh, which was found to be 1.5 percent during the preceding decade, i.e., 1967-68 to 1976-77<sup>32</sup> has been used. As it is not possible to get any idea of difference in the rates of growth of income of the rural-urban workers separately, it is assumed that the rate of 1.5 percent holds good for both groups of population.

#### vi) Ability

Neither earnings nor earnings differentials can be attributed to education

Table 4

#### FACTORS OF ADJUSTMENT

	Rate of Wastage		Rate of Unemployment		Non-Participation in Labour Force	
	Rural	Urban	Rural	Urban	Rural	Urban
Literacy	---	---	26	19	44.58	21.56
Primary	28.08	54.76	31	30	50.8	37.2
Middle	55.15	76.73	37	47	51.42	40.76
Secondary	17.89	24.89	37	42	64.88	54.55
Intermediate	18.15	25.25	18	19	79.82	79.89
IDegree (Gen.)	51.39	63.37	37	30	79.82	79.89
IIDegree (Gen.)	---	90.79	---	10	---	79.89
Higher (Gen.)	---	58.54	---	29	---	79.89

Note: **Wastage Rate** : Primary and Middle :Promotion Rates; Other Levels : Pass Rates; I Degree (Gen.) : Based on District data; Other : Based on state data

**Unemployment** : Average waiting period in months (based on place of employment secured).

27. Rates of participation could be estimated by either age groups or educational levels. However, the later have been used for our purpose, as rates of participation are found to be more sensitive to education than to age. When rates of participation are regressed alternatively on age and years of schooling separately for rural and urban labour force, the simple linear regression coefficients of years of schooling separately for rural and urban labourers respectively (both significant at 1 percent level); the regression coefficients of age, 0.46 and 0.55 respectively for rural and urban labourers, are not statistically significant.

28. See Tilak (1978 and 1987) for more details.

alone. A substantial part of individual earnings can reasonably be attributed to several factors such as innate ability, motivation, social back-ground, etc., which are grouped together in the literature and named as 'ability factor.' The residual attributable to education, is known as alpha ( $\alpha$ ) coefficient. In the literature, there are several methods of dealing with this adjustments :

- a) the results are reported without this adjustment (eg., Hansen 1963).
- b) The results are qualified by making that it is reasonable to make this adjustment in interpretation and it is left to the reader to make (eg., Cornoy, 1972 a).
- c) Denison's (1964) or Becher;s (1964) alpha coefficient of 0.66 is used (it is being universally adopted).
- d) Different values of alpha coefficient are alternatively assumed (eg., Blaug et al, 1969; and Pandit, 1972).
- e) Different values of alpha coefficient are assumed for different levels of

education (eg., Cornoy, 1972b; and Goel, 1975)

- f) Multiple regression analysis is used to isolate the effect of education on earnings (eg., Thias and Carnoy, 1972; and Blaug, 1971, etc.) Now a days this is also being increasingly used.

Multiple regression method can be meaningfully used if we are having very large samples. Hence alpha ( $\alpha$ ) coefficients are arbitrarily chosen in the present context. The assumed values of alpha coefficients are 0.75 and 0.60 for rural and urban workers respectively, and they are assumed to be the same for all educational levels.<sup>33</sup>

It may be noted that except the adjustment for growth in incomes all the other adjustments tend to push down the rates of return and the magnitude of effect depends upon the magnitude of the adjustment factors. Here for operational convenience, rates of return are adjusted cumulatively for these factors in the following order : (a) wastage, (b) growth in incomes, (c) unemployment, (d) non-participation in

29. In most cases in the literature, we note that the cross section data only are used. Those who could use time series data include, Rogers (1969), and Taubman and Wales (1974).

30. See Eckaus (1974) for more details.

31. See Miller and Hornseth (1971) who concluded that this method was a good approximation to actual experience. See also Cohn (1979, pp. 42-44 for a discussion on cross section versus life-cycle data.

32. The rate of growth is estimated using the familar semi-log regression equation of the form

$$\text{Log } Y = \alpha + \beta t$$

Where Y is the variable for which the rate of growth is estimated, t the time period, and  $\alpha$  an  $\beta$  are respectively intercept and regression coefficients estimated by the equation. The rate of growth

$$g = [(\text{Antilog } \beta) - 1] * 100.$$



labour force, and (e) ability.

Internal rates of return are estimated from the private as well as society's point of view. Private rates of return are estimated considering the private cost of education and after-tax earnings, and social rates of return are estimated considering pre-tax earnings on the benefits side and social costs of education on the cost side.<sup>34</sup> It may be noted that the concept of 'social' rate of return as used in the literature on economic of education is distinct from 'social' rate of return used in the general theory of investment criteria. In the general theory the social rate of return is estimated by replacing market wages / prices by shadow wages / prices. Such attempts are very few in the literature on economics of education.<sup>35</sup> But the "general belief seems to be that though the matter is serious, it does not destroy the validity of the rate of return concept" (Barrios and Davis, 1980, p.92). In the literature on economics of education income tax payments are considered as the non-private benefits of education, which accrue to the society rather than to individuals directly. So for

estimation of private rates of return the post or after tax earning are considered. The implication is that "gross earnings are a measure of marginal social product" (Sheehan, 1973, p.44).<sup>36</sup>

The private rates of return are useful for the analysis of private behavior and the social rates return which reflect the full costs and before tax earnings, are useful as an input in the formulation of social policy. Further, marginal rates of return are estimated considering costs and earnings differentials between two successive levels of education, while average or total rates of return are estimated comparing the earnings and costs of a given level of education with those of illiterates.

### 3.3.2 Estimates of Rates of Return

Internal rate of return approach fails to capture several externalities of education and hence it is doubted whether it would be useful for inter-sectoral planning. But is regarded to be highly useful for intra-sectoral planning as well as for comparing different groups of population such as rural and urban groups.<sup>37</sup> A word of caution is

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33. In this task, we are guided by (a) the relative magnitudes of simple linear regression coefficients of education which are 0.0539 and 0.0346 respectively for rural and urban samples, when log earnings are regressed on years of schooling in each case (both are significant at 1 percent level), and (b) the available empirical evidence, summerized by Psacharopoulos (1975), who conducted : "Firstly, greatest part of observed earnings differentials by educational levels is due to education. When all available studies are taken into account, this part is greater than it was thought before. Secondly, we cannot be conclusive of whether the value of alpha rises or falls by educational levels. Hence, at this agonistic stage, one may continue to use a single alpha for all educational levels. And of course, this value would have to be well above the 60 percent used universally so far". (p.58)

34. See Tilak (1981a) for details.



necessary, however, while interpreting the results, due to complications arising out of rural-urban migration. The age-earnings profiles of the individuals in rural areas are compared with costs of education in rural areas, and the earnings profiles of the individuals working in urban areas with cost of education in urban schools, and the corresponding rates of return are respectively referred to as rates of return to education in rural and urban areas, or simply rural and urban rates of return to education.<sup>38</sup>

The estimated rates of return are presented in Tables 5 and 6. The unadjusted or crude social rates of return are depicted in Figures 3 and 4. Each set of rates of return when considered within themselves possesses the following general characteristics :

- (a) Estimates if private rate of return exceed social rates if return at every level of education, since in India, as in most other countries, education is considerably subsidized by the governments. The difference in the private and social costs is much higher than the difference in respective earnings.
- (b) Our estimates also conform to the general pattern of declining trend for increasing levels of education. This is particularly true with respect to unadjusted marginal rates of return.
- (c) The unadjusted average, as well as marginal private rates of return to education in rural areas have been found to be higher than the urban rates if return at every level of education, except at the primary level in respect of marginal rate of return. The unadjusted social rates if return also yield same conclusion except that the rural marginal rate to secondary education is less than the urban rate of return.
- (d) When considered in terms of the fully adjusted rates of return, the picture, however, changes. The marginal private and social rates of return indicates that literacy, middle level and First Degree general education carry higher returns in rural areas than in urban areas, while other levels of education yield higher returns in urban areas.
- (e) On the other hand, average rates of return suggest that literacy, primary

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35. For example, see Psacharopoulos (1970).

36. See for a critique of this assumption, Blaug (1967a).

37. See Blaug (1967b, 1970 and 1972) for a critique of this assumption.

38. This apparent complication could not be avoided, as information was not collected on whether an individual member of the work force in rural or urban areas had received his education in rural areas or in urban areas.

Table 5  
**MARGINAL RATES OF RETURN TO EDUCATION (Z)**

	R <sub>0</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>
<b>Private</b>						
<b>Rural</b>						
Literacy-Illiteracy	15.86	8.60	10.35	10.29	6.73	4.09
Primary-Literacy	27.09	14.82	16.55	15.02	10.79	9.17
Middle-Primary	23.84	18.12	20.00	18.34	13.96	12.25
Secondary-Middle	19.38	0.17	2.35	-ve	-ve	-ve
Inter-Secondary	16.64	3.80	5.41	5.06	3.98	2.70
IDegree (Gen.) - Inter	13.63	8.91	10.65	8.97	8.00	6.82
<b>Urban</b>						
Literacy-Illiteracy	10.71	7.99	9.74	9.56	3.90	2.25
Primary-Literacy	41.15	26.71	28.61	23.35	13.10	9.55
Middle-Primary	19.20	16.37	18.25	17.40	9.86	6.79
Secondary-Middle	18.60	17.91	19.76	16.24	11.81	8.46
Inter-Secondary	11.49	12.85	14.60	14.28	12.82	9.82
IDegree (Gen.)-Inter	11.60	8.67	10.38	9.76	8.58	6.10
IIDegree (Gen.)-						
IDegree (Gen.)	13.45	12.61	14.37	11.69	10.54	8.01
Higher (Gen.)-Inter	8.11	5.09	6.82	6.58	5.51	3.29
Higher (Prof.)-Inter	14.15	---	---	---	---	---
<b>Social</b>						
<b>Rural</b>						
Literacy-Illiteracy	13.15	6.71	8.42	8.38	5.11	2.71
Primary-Literacy	23.92	12.92	114.26	13.14	9.16	7.70
Middle-Primary	18.12	13.51	15.30	14.41	10.50	8.98
Secondary-Middle	14.54	-ve	-ve	-ve	-ve	-ve
Inter-Secondary	14.01	2.54	4.09	3.86	2.84	1.62
IDegree (Gen.)-Inter	12.58	8.19	9.90	0.50	7.54	6.35
<b>Urban</b>						
Literacy-Illiteracy	10.01	7.44	9.13	8.96	3.46	1.81
Primary-Literacy	38.00	24.57	26.43	21.88	12.24	8.85
Middle-Primary	15.04	12.54	14.35	13.77	7.41	4.92
Secondary-Middle	15.97	4.71	6.33	5.65	1.43	-ve
Inter-Secondary	10.32	3.38	4.94	4.90	3.97	2.04
IDegree (Gen.)-Inter	11.50	8.42	10.11	9.44	8.22	5.73
IIDegree (Gen.)-	---	---	---	---	---	---
IDegree (Gen.)	11.82	11.09	12.83	10.68	9.62	7.29
Higher (Gen.)-Inter	7.10	4.38	6.06	5.83	4.84	2.78

Note : -ve Net Present Value is negative

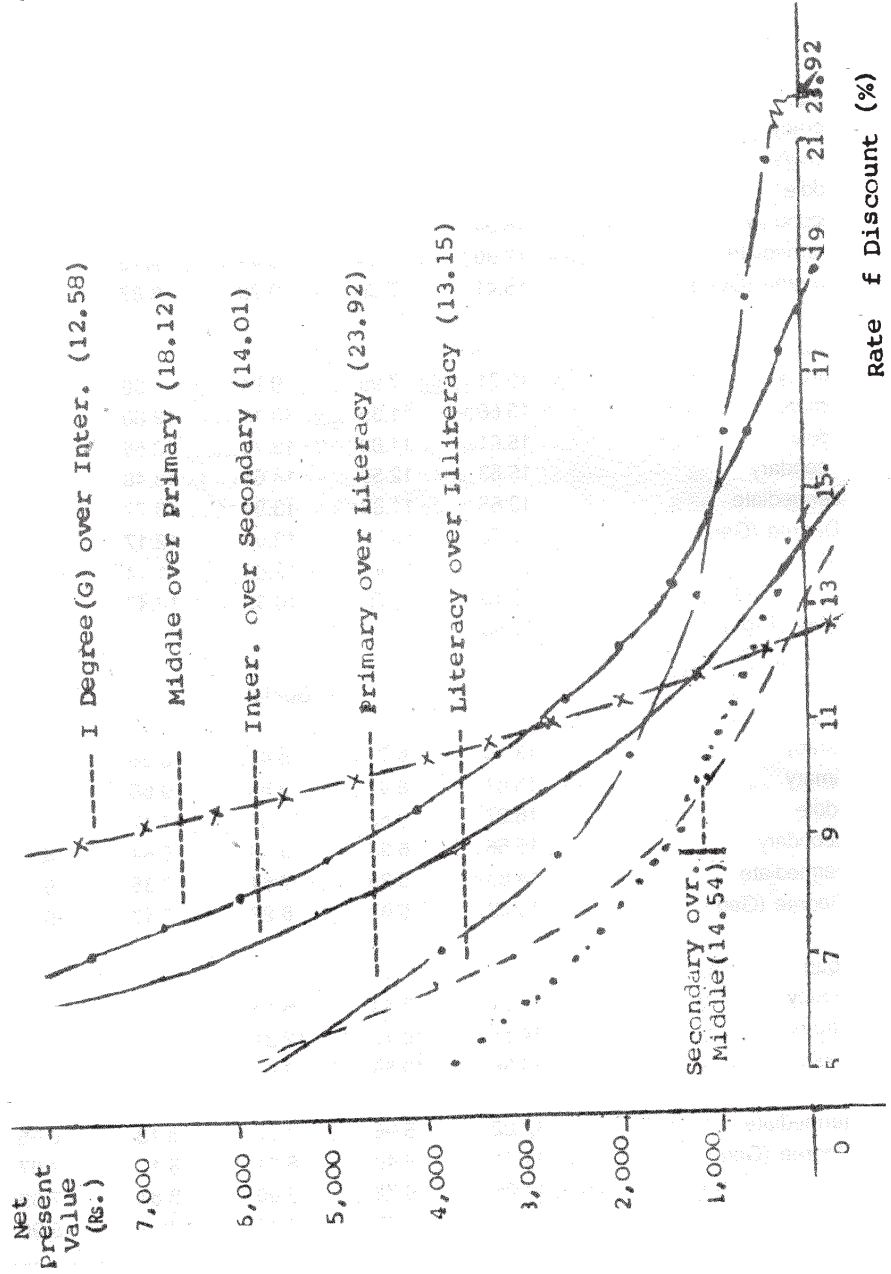
--- Not estimated

Table 6  
**AVERAGE RATES OF RETURN TO EDUCATION (Z)**

	R <sub>0</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>
<b>Private</b>						
<b>Rural</b>						
Primary	18.67	10.13	11.96	11.66	8.30	6.99
Middle	19.76	12.05	13.99	13.54	9.99	8.65
Secondary	18.94	9.03	11.23	10.66	8.27	6.71
Intermediate	17.90	7.14	9.49	9.10	7.83	6.32
IDegree (Gen.)	15.41	7.36	9.73	8.67	7.63	6.36
<b>Urban</b>						
Literacy	10.71	7.99	9.74	9.56	3.90	2.25
Primary	15.66	11.30	13.16	12.60	7.63	5.53
Middle	15.61	11.80	13.76	12.55	8.01	5.89
Secondary	15.63	12.59	14.65	13.48	10.14	7.65
Intermediate	13.65	11.82	13.94	13.77	12.46	9.67
I Degree (Gen.)	12.76	10.72	13.03	12.17	10.95	8.40
II Degree (Gen.)	12.14	10.45	12.85	11.74	10.54	7.95
Higher (Gen.)	10.19	7.79	10.32	12.47	9.54	6.92
Higher (Prof.)	12.89	---	---	---	---	---
<b>Social</b>						
<b>Rural</b>						
Literacy	13.15	6.71	8.42	8.38	5.11	2.71
Primary	15.67	8.07	9.86	9.66	6.62	5.48
Middle	16.27	9.62	11.51	11.17	7.94	6.72
Secondary	15.56	6.93	9.00	8.64	6.47	5.11
Intermediate	14.83	5.39	7.61	7.35	6.17	4.79
I Degree (Gen.)	13.22	5.97	8.27	7.47	6.49	5.27
<b>Urban</b>						
Literacy	10.01	7.44	9.13	8.96	3.46	1.81
Primary	14.55	10.47	12.31	11.81	7.03	4.97
Middle	13.96	10.55	12.49	11.46	7.14	5.08
Secondary	14.00	8.47	10.63	9.87	6.74	4.41
Intermediate	12.22	5.96	8.23	8.13	6.95	4.56
I Degree (Gen.)	11.71	6.40	8.71	8.17	7.07	4.82
II Degree (Gen.)	11.05	6.72	9.00	8.81	7.69	5.44
Higher (Gen.)	9.34	4.95	7.34	6.89	5.90	3.78

Note : --- Not estimated

Figure  
DISCOUNTED PRESENT VALUE OF NET SOCIAL RETURNS



Figure

DISCOUNTED PRESENT VALUE OF NET SOCIAL RETURNS  
TO ADDITIONAL EDUCATION (UNADJUSTED) IN URBAN AREAS

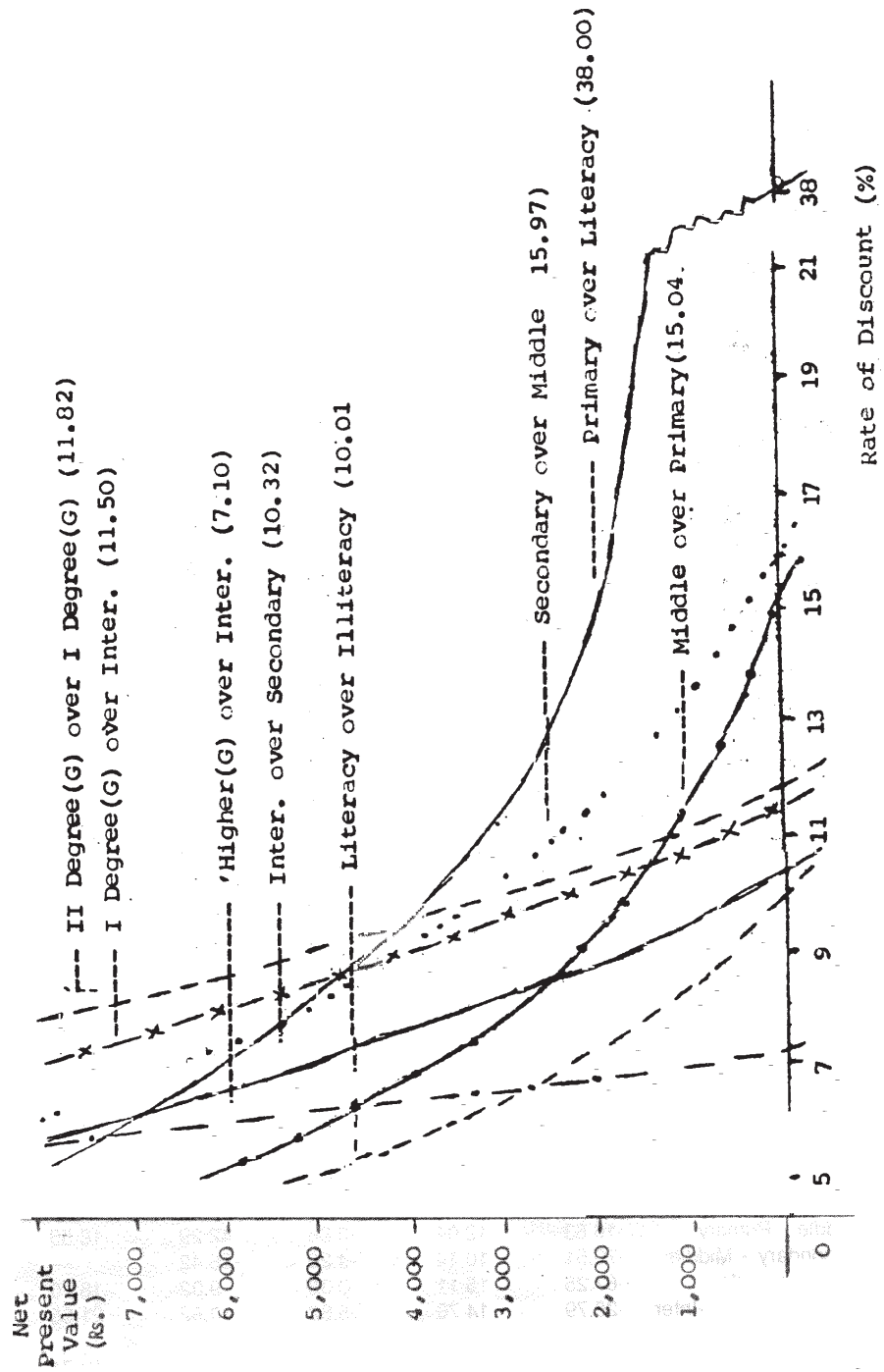


Table 7  
**DIFFERENCES IN RETURNS TO EDUCATION**  
**(Rural Rates of Return minus Urban Rates of Return)**

	Unadjusted		Adjusted	
	Private	Social	Private	Social
<b>Differences in Marginal Rates</b>				
Literacy-Illiteracy	5.15	3.14	1.84	0.90
Primary-Literacy	-14.06	-14.08	-0.38	-1.15
Middle-Primary	4.64	3.08	5.46	4.06
Secondary-Middle	5.15	3.69	---	---
Inter-Secondary	5.15	3.69	-7.12	-0.42
l Degree (Gen.) -Inter	2.03	1.08	0.72	0.62
<b>Differences in Average Rates</b>				
Literacy	5.15	3.14	1.84	0.90
Primary	3.01	1.12	1.46	0.51
Middle	4.15	2.31	2.76	1.64
Secondary	3.29	1.56	-0.84	0.70
Intermediate	4.25	2.61	-3.35	0.23
l Degree (Gen.)	2.65	1.51	2.04	0.45

Table 8  
**PERCENTAGE EFFECT OF ADJUSTMENT FACTORS ON CRUDE SOCIAL**  
**RATES OF RETURN TO ADDITIONAL EDUCATION**

	Wastage	Growth in Incomes	Unemployment	Non-Participation in Lab. Force	Ability	Total
<b>Rural</b>						
Literacy-Illiteracy	-48.97	13.01	-0.31	-24.87	-18.25	-79.39
Primary- Literacy	-47.41	7.02	-4.68	-16.64	-6.10	-67.81
Middle-Primary	-25.45	9.88	-4.91	-21.41	-8.65	-50.45
Secondary-Middle	---	---	---	---	---	---
Inter.-Secondary	-81.88	11.07	-1.64	-7.28	-9.71	-89.44
l Degree (Gen.)-Inter.	-34.90	13.59	-11.13	-7.63	-9.46	-49.53
<b>Urban</b>						
Literacy-Illiteracy	-25.68	16.88	-1.69	-54.95	-16.48	-81.92
Primary-Literacy	-35.35	4.90	-0.98	-25.36	-4.93	-72.72
Middle-Primary	-16.63	12.04	-3.86	-42.29	-16.55	-67.29
Secondary-Middle	-70.51	10.14	-4.26	-26.42	---	---
Inter.-Secondary	-67.25	15.11	-0.38	-9.02	-18.70	-80.24
l Degree (Gen.)-Inter	-26.79	14.70	-5.82	-10.62	-21.65	-67.29
ll Degree (Gen.)-	---	---	---	---	---	---
l Degree (Gen.)	-6.18	2.32	-1.15	-8.97	-19.71	-33.69
Higher (Gen.)-Inter	-38.31	23.36	3.24	-13.95	-29.01	-60.85

and middle levels of education are more profitable from private point of view in rural areas than in urban areas, and educational all levels is socially more profitable in rural areas than in urban areas.

Thus, on the whole, the evidence seems to suggest that investment in education in rural areas yields a rate of return comparable with, if not more than, the rate of return to investment in education in urban areas.

### 3.3.3 Effect of Adjustment Factors on Rates of Return

In order to appraise the relative importance of various factors for which the internal rates of return are re-estimated, a small exercise is carried out which can be described as follows:

It may be noted that for arriving at fully adjusted rates of return, a procedure was followed, which yielded successively adjusted rates. Now the relative share of successive adjustment factors in the total effect can therefore be obtained by taking the successive differences of the adjustments over the crude rates. Thus if  $\delta R_1$  represents the percent effect of adjustment factor 1 on the crude rate of return,  $\delta R_2$  the percent effect of factors 1 and 2,  $\delta R_3$  the percent effect of factors 1, 2 and 3, and so on, then  $\delta R_2 - \delta R_1$  gives the effect of factor 2 on crude rates, and  $\delta R_3 - \delta R_2$  gives the percent effect of factor 3 and so on the crude rates of return. In this way, the effect of each adjustment factor and the total effect of all factors on crude social

rates of return to incremental levels of education are arrived at and are present in Table 8.

It may be seen that the effect of wastage is the highest compared to any other factors at any level of education, excepting at Second Degree (Post Graduate) general level of education in urban areas at which level ability is having the highest effect. The effect of wastage is so high that rural rates of return to secondary education becomes negative. The next important factor is non-participation in labour force. Country to what is generally feared, unemployment is having the least effect in pushing down the rates of return to education. On the whole, the estimates of rates of return suggest that there are glaring rural urban inequalities in returns to education and that returns to education in rural areas in general are higher than in urban areas. The straight forward policy implication that follows is : *invest more in the education of rural areas*. The results also suggest that efforts to reduce wastage in education pays rich dividends in the form of steep increases in the rates of return in both rural and urban areas, the relative increase being higher in rural areas.

## 4. Inequality in Human Capital Formation :

The rural urban inequalities in rates of return to education that were observed in the preceding section can be better understood, if we analyse rural urban inequalities in human capital formation on

the one hand, and earnings differentials on the other. This is attempted in this and the following sections.

Educational levels attained by rural population in a country **vis-a-vis** by the urban population throw much light on the problem of inequality in human capital formation. Years of schooling although is a necessary indicator of human capital, it does not capture adequately the costs of schooling and quality aspects of education. An attempt is made here to construct a comprehensive index of the stock of human capital, the one that takes care of both quantitative and qualitative aspects of education. It is however, restricted for obvious reasons to formal education only. In the literature we find the index of human or educational capital being constructed in two different ways, apart from the one based on years of schooling (Harbison and Myers, 1964), one using the discounted present value of earnings a weights (eg., Selowsky, 1967; and Denison, 1967), and the other using the costs of education. The latter method<sup>39</sup> is relatively more extensively used.<sup>40</sup> An important reason is that a cost-weighted measure of educational capital only can incorporate in real terms the resource inputs that have gone into the process of production of educational capital, and this is in conformity with the concept of physical capital

formation. Further, the cost-weighted index is free from the problems of choice of appropriate rate of discount, a crucial problem to be faced with while estimating the discounted present value of earnings.

#### 4.1 The Method :

The stock of human capital in the state of Andhra Pradesh is estimated separately for rural and urban areas, with the help of (a) social costs of education computed in Section 3, and (b) population classified by education levels in rural and urban areas, derived from the Census data. The method can be briefly noted as follows :

If  $P_{ij}$  represents the population with  $i$ -th level of education in  $j$ -th area (rural or urban), and  $C_{ij}$  represents per pupil social costs of human capital (THC) in  $j$ -th area is given as follows :

$$THC_j = \sum_i P_{ij} \cdot C_{ij} \quad \dots \text{Eqn. 2}$$

and the indexed of the same, THCI, is given by Equation 3.

$$THC_j = \sum_i P_{ij} \cdot C_{ij} \quad \dots \text{Eqn. 3}$$

Where  $P_{ij}$  represents the proportion of population with  $i$ -th level of education in the  $j$ -th area to the total population in the  $j$ -th area.

Since there are several kinds of leakages within the educational process as

39. See Psacharopoulos (1973) for more details.



well as in the labour market, the level of 'realised' or 'active' human capital is not represented by this index. Hence, it is also attempted here to prepare another index, called (AHCI). The AHC and AHCI can be estimated by replacing  $P_{ij}$  and  $P_{ij}$  in Equations 2 and 3 by  $W_{ij}$  (workers with i-th level of education to total workers in j-th area) respectively. The AHC and AHCI take care of several leakages like unemployment and non-participation in labour force.

A summary measure like coefficient of inequality can also be computed for both these human capital indices (HCI) which can be defined as

$$K_{hc} = (HCI_j / HCI_k) - 1 \quad \dots \text{Eqn. 4}$$

where  $K_{hc}$  represents coefficient of inequality in human capital, between population groups j and k. It may be noted that if k is zero, it indicates perfect equality and if it is different from zero, it indicates inequality between the two groups. Clearly if the coefficient is positive, the distribution of human capital is skewed against the group k and vice-versa.

## 4.2 The Results :

As the costs of education estimated earlier refer to 1976-77, and as the census data to 1971, costs of education for 1971 are estimated using the all-India consumer price index as no other alternative is

available.<sup>41</sup> The estimates of stocks of total and active human capital are presented in Table 9. The ratio of distribution of total human capital between rural and urban areas in the state of Andhra Pradesh is 1:1:37. Since the distribution of population is not equal in both areas, it would be meaningful to compare not absolute figures, but per capita total human capital in rural and urban areas. The total human capital per capita shows wide inequalities. It is nearly six times higher in urban areas compared to rural areas. Viewed from the angle of educational levels, lower levels of education have larger share than higher levels of education in rural areas in the stock of total human capital, while the opposite is the picture in urban areas.<sup>42</sup> The coefficient of inequality, being negative indicates that the distribution is skewed against the rural areas. Further, the coefficients show a consistently increasing trend for increasing levels of education (if we ignore literacy level). Estimates of active human capital also exhibit a similar pattern.

The main conclusion, thus, that emerges from our analysis is that great inequalities exist in the distribution of stock of human capital between rural and urban areas. This rural urban inequality implies under investment on one hand, and mal-investment on the other. The unadjusted rates of return to education in Section 3

40. For example, see Schultz (1961), Nallagoundan (1967), Panchamukhi (1965), Tilak (1979b and 1982) and Rao (1982).

clearly showed under investment in education in rural areas. Education in rural areas is discouraged for a variety of reasons. Fundamentally, there is a widespread belief that economic growth can be achieved without educating the rural masses.<sup>43</sup> Further, the ruling elite feels that it is against their interests to improve the education standards of the rural population.<sup>44</sup> At the same time the urban ruling elite have to make meager investments in education in rural areas and tolerate a reduction in inequality as “the

price of stable, crisis-free growth” (Lipton, 1977, p.43). While this is so with respect to public policy, the rural masses themselves under invest in their education for several reasons. The opportunity cost of education in India is very high, particularly in rural areas.<sup>45</sup> A very large number of households in Indian villages depend upon the labour of their young children. Children do participate not only in specific agricultural activities like sowing, watering, harvest-ing, etc., but also in day to day activities like taking care of young siblings, grazing the cattle, bringing

Table 9  
STOCKS OF TOTAL AND ACTIVE HUMAN CAPITAL IN  
ANDHRA PRADESH, 1971

	Rural			Urban			K <sub>nc</sub>
	Total	Percent	Index	Total	Percent	Index	
<b>Total Human Capital</b>							
Literacy	160	14	45.7	180	11.5	214.4	-0.79
Primary	403	35.3	114.8	244	15.6	290.7	-0.61
Middle	235	20.6	67	230	14.7	274.3	-0.76
Secondary	188	16.5	53.4	366	23.4	435.2	-0.88
Higher	156	13.7	44.3	540	34.6	643.1	-0.93
All Levels	1142	100	325.2	1561	100	1857.7	-0.82
<b>Active Human Capital</b>							
Literacy	71	11.5	46.3	38	4.7	148.3	-0.69
Primary	204	32.9	132.2	89	11	344.1	-0.62
Middle	119	19.2	77	89	11	346.2	-0.78
Secondary	114	18.4	73.9	187	23.1	723.3	-0.9
Higher	111	17.9	72.2	405	50.1	1568.9	-0.95
All Levels	620	100	401.7	808	100	3130.8	-0.87

Note : Totals are Rs. In 10 millions.

41. The absence of an appropriate educational price index is widely felt. See Robbins Commission (1963). See also Pandit (1972), Shri Prakash (1978), who used the all-India consumer price index in similar contexts. See also Tilak and Varghese (1983). There are very few attempts in the literature to construct an educational price index. See Wasserman (1963), ESCD (1979) and Halstead (1983).

water, and things like.<sup>46</sup> Thus essentially the financial status of the villagers forms an important handicap for all activities, including investment in education, specially in books, stationery, clothes, etc., and in opportunity costs. Further, the home environment in rural areas is far from being congenial for study. Few homes are equipped with any facilities conducive for study at home.

A significant proportion of the population, particularly in rural villages strongly and rightly believe that education has an undesirable effect on their children. Apart from the fact that education does not impart any skills or knowledge relevant for the rural activities, it impairs the children's attitudes towards village life, cultivation, manual labour and other rural activities. It makes them not only to run for white collar urban jobs, also to look at rural activities with contempt. On the other hand, there are a large majority of the rural masses who are just ignorant of the potential benefits of education.

Thus, to conclude on the whole there has been under investment as well as mal-investment in the education in rural areas. This has serious effects on rural

development. As Lipton (1977, p.260) put it, "the share of education allotted to the *rural-born child* is not *enough* either to give him a fair share of the chances of personal development available in his country or to allocate education resources efficiently; yet, the share of educational allotted to the *rural sector* is *more than enough* to harm its prospects of development and the efficiency with which education resources are allocated" (emphasis original).

In short, "despite the Illich furor, the principle of 'deschooling' has been applied for years in the rural parts of the low income world" (Wood, 1973 p.137).

## 5. INEQUALITY IN EARNINGS :

Weaker sections of the Indian society are subject to severe discrimination in the labour market in a variety of ways, which can be visualized in the form of high unemployment and lower wages. Rural workers of the economy are no exception to this. However, earnings differentials between rural and urban labourers may not be studied in the framework of discrimination, as neither the employers nor the labour market are competitive with each

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42. See also Dasgupta and Tilak (1983) for additional evidence on related aspects.

43. For instance, Nash (1973, p.349) concluded : "From observation and experience in the Asian scene, rural development takes place largely beyond and without the intervention of formalized schooling".

44. See Malassis (1976) for more details.

45. See Bhagavati (1973) for some details.

46. See AERC (1971) for some interesting details. See also Dasgupta et. al. (1977) and Tilak (1979c).

other.<sup>47</sup> In fact, rural-urban labour market hypothesis' which is "still more a hypothesis than theory" (Marshall, 1974, p.856). The basic hypothesis of dual labour market hypothesis is that the labour market is 'balkanized' or divided into two essentially distinct and non-competitive groups.<sup>48</sup> However, rural urban migration of labour for reasons such as high wages, better working conditions, etc., may reflect, to some extent, competitiveness among the labour markets in rural and urban sectors. The relationship between the two can be better explained in words of Lipton (1977, p.172): "The great poverty of the country side offers a grim alternative to the urban 'reserve army' of half-employed, and thus lowers its earnings and bargaining power; all this helps to maintain urban inequality. The growing tendency of rural landlords and money lenders to transfer to urban investments their savings from rural exploitation – because it stops the reticulation of such property income to the rural poor must worsen rural inequality."

### 5.1 The Method :

To study the rural urban inequality in earnings, Becker's (1957) coefficient of wage discrimination is adopted here, which is analogous to the coefficient of inequality used in Section 4, as a simple measure of inequalities in earnings. The coefficient of

inequality in earnings  $K_w$  is, defined, *mutates mutandis*, as follows :

$$K_{wm}^n = (E_{jm}^n / E_{km}^n) - 1 \quad \dots \text{Eqn.5}$$

where  $E_j$  and  $E_k$  refer to the mean annual earnings of groups j (urban workers), and K (rural workers) respectively, m to the educational level and n to the age-group. A positive  $K_w$  indicates that the inequality is against group K and negative value against group j. It is essential to note here that several factors such as education, age, experience, occupation, etc., may explain a substantial part of the rural urban earnings differentials; but we are able to standardize the inequality coefficient for the first two factors, viz., education and age, which are recognized as the most dominant variables explaining inequality in earnings.<sup>49</sup>

### 5.2 The Results :

The coefficients of inequality presented in Table 10 provide some idea of the magnitude inequality in earnings between rural and urban workers. It may be noted that most of the coefficients are positive indicating that the earnings differentials are against rural workers. However, we find very few cases of large differences with the value of coefficients being more than 1. The value of the positive coefficients varies from 0.027 to 1.366.

47. I owe this clarification to the late Professor J.N. Sinha.

48. See Wachter (1974) and Doeringer and Piore (1970) for more details about dual labour market hypothesis. See also Cain (1976) for a survey of theories of labour market segmentation.

Table 10  
**COEFFICIENTS OF INEQUALITY EARNINGS BY AGE AND  
 LEVEL OF EDUCATION**

Age Group	Educational Level					
	E <sub>0</sub>	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	E <sub>4</sub>	E <sub>5</sub>
8-10	0.8496	---	---	---	---	---
11-13	0.1952	0.2612	0.5000	---	---	---
14-18	0.0812	zero	0.7257	0.4000	0.7708	---
19-21	-0.0352	0.5000	0.5780	1.3662	-0.0665	-0.3395
22-25	0.5794	-0.4131	-0.3646	-0.2896	0.2507	0.3942
26-30	0.4705	0.3250	-0.0537	-0.0925	0.0270	0.0505
31-35	0.2075	0.2500	0.4222	-0.0925	0.0270	0.0940
36-40	0.0363	0.1375	0.7049	0.0649	0.0221	0.1832
41-45	-0.1694	-0.5540	-0.5044	-0.1044	0.1202	0.3453
46-50	-0.1899	-0.5540	-0.5044	-0.2909	0.2520	0.2203
51-55	zero	1.2570	0.3157	-0.2958	0.1168	-0.2000
55 +	0.3496	0.0505	0.0895	0.6314	-0.0049	1.0208
All Age Groups	-0.0949	0.1015	0.2251	-0.1083	0.0703	0.1316

Cont'd...

Age Group	Educational Level				
	E <sub>6</sub>	E <sub>7</sub>	E <sub>8</sub>	E <sub>9</sub>	E <sub>5</sub>
	---	---	---	---	0.8496
	---	---	---	---	0.2723
	---	---	---	---	0.7264
	---	---	---	---	0.1517
	-0.0429	0.1324	0.0415	0.3005	0.4094
	0.3086	0.3239	0.3203	0.0382	0.4460
	0.1918	0.1938	0.1949	-0.0143	0.3176
	0.6179	0.7078	0.7282	0.0541	0.6838
	-0.3004	0.8032	-0.2191	-0.1982	0.4017
	-0.5000	zero	-0.2974	-0.4480	0.4132
	0.4951	0.4638	0.6154	-0.3865	0.7021
	0.5262	0.8096	0.6746	0.3242	1.7338
	0.0539	0.3330	0.1530	-0.0695	0.4760

While the few negative coefficients (indicating earnings differentials in favour of rural workers) range from 0.0049 to 0.5794, implying that even in those few cases favourable to the rural workers, the earnings of the rural labourers are not higher than 60 percent of the earnings of the urban workers. Thus the earnings differentials are mostly against rural work force.

While these results clearly indicate that the earnings differentials are mostly in favour of urban workers, the results do not allow us to make any more inferences on the pattern of difference by educational levels or by age-groups. In fact if we look at the coefficients of inequality by all age-groups, the coefficients are not very high. On the other hand, if we look at the last column, i.e., by all levels of education, we find the coefficients of inequality to be high, even though there is neither increasing nor decreasing pattern by age-groups.

What are the important causes of these inequalities in earnings? In the organized sector of the urban areas, where a substantial part is organized, wages and salaries are high, and urban areas are well known and this necessitates differentiation in wages. In urban areas, where cost of living is high, wages and salaries too are high. So all disparity in money earnings is not real, but is only apparent. However, the differences in cost of living cannot explain fully the disparities in wages.

The rural urban earnings differentials may essentially, be due to the fact that villages offer poor job prospects compared to urban areas. Further, in urban areas demand for labour expands fastly and given the inadequate supply of labour, and relatively less mobile labour, and relatively less mobile labour of required skills from rural areas, competition among the employers in urban areas leads to increase in wages in urban area, while this is not the case in rural areas. Besides, the economics in industrial production, which cannot be reaped in rural modes of production (at least at the same level) may also induce employers to pay higher wages in urban areas. The trade-unions which are rare in rural areas, also are responsible for rural urban inequality in wages. In short, the existing 'urban labour aristocracy' enjoys higher wages relative to ignorant rustic labour, because "it (urban labour force) is too small, it is too costly for the employer to do without their skills, cheap to pay them off and easy to acquire capital subsidies to keep employment levels low" (Lipton, 1977, p.66). On the other hand, the rural labour force is too huge in size to organize, less educated and illiterate and ignorant.

In fact, the distinction between rural and urban areas particularly in developing economies like ours is closely analogous to that between industrialized and developing economies, the more developed enjoying all

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49. See Mincer (1974) and Fields (1980).

the manufactured goods and services, apart from food grains transported from rural areas. On the other hand, the rural areas are subject to 'multiple deprivation.' The differences in money earnings between rural and urban areas are much above the difference in costs of living in the two areas. The standards of living of the real incomes also differ substantially in favour of urban workers.<sup>50</sup>

#### 6. SUMMARY AND CONCLUSION :

The general presumptions are that -

- (a) the economic returns to investment in education of rural masses are relatively less compared to those of urban workers and hence any public subsidization of education of the rural workers can be supported only on economic grounds like social equality,
- (b) the rural household tend to invest less in the education of their children as they fail to recognize the benefits of education and or as they cannot afford to invest, and
- (c) there exist large earnings differentials between rural and urban workers.

All these presumptions are open to question. Based on the data collected through a sample survey in the West Godavari District of Andhra Pradesh in South India, the above hypotheses have been examined in this paper. The analysis rejects the first hypothesis and establishes

that the rates of return to education of rural workers are generally higher than the returns to urban workers. The study, without exactly verifying into the factors behind, confirms the latter two hypotheses. Thus the latter two findings suggest for policy measures that ensure equality in human capital formation as well as equality in earnings.

Investment in education of rural masses has been advocated in general, essentially on grounds of equality, distribution and welfare. But the evidence on rates of return presented efficiency grounds as well, investment in education of rural masses can be supported. It should be noted that rates of return to education of rural workers are higher in spite of the existing earnings differentials in favour of urban workers. Hence policies that aim at rural urban equality in earnings would further enhance the returns to education of rural workers. The lower costs of education in rural areas may, nevertheless reflect poor quality of education, the rural masses receive. It is necessary thus not only to invest more in the education of rural workers, but also more per pupil so that the inequalities in the quality of education are also reduced.

A pertinent question that arises in this context is despite higher rates of return, why do rural households not send their children to schools ? The argument that

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50. See Brown (1977, p.277) for similar arguments in relation to UK.



opportunity costs of education are high may not totally hold good, because as we have found, returns to education are higher in rural areas even after accounting for opportunity costs. Then the answer can be either that the rural households are irrational and cannot foresee the potential benefits of education, which is disputed by many,<sup>51</sup> or that there are several other factors which we could not bring into our analysis, or both. For example, the timing of the schools in rural areas might form an important problem for school enrollments as pointed out by several others (eg., AERC, 1971). Further, the real opportunity cost of the students may be different from the monetary opportunity cost estimated here. For example, children may relieve their adults for work and this cannot be reflected in the estimates of money opportunity costs. A detailed examination of determinants provide satisfactory answers. However, the present analysis clearly asserts that investment in education in rural areas is economically as justified as in urban areas, both from individual and the society's points of view.

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51. For example, it is widely held that rural farmers in India are illiterate but not 'inefficient'. See Schultz (1964).



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incomes, unemployment and non-participation in labour force.  
 $R_5$  Adjusted for wastage, growth in incomes, unemployment, non-participation in labour force, and ability.

## Appendix

### NOTATION

#### *Levels of Education*

$E_0$	illiterate (no formal Schooling)
$E_1$	Literates (assumed to be having 4 years of schooling)
$E_2$	Primary
$E_3$	Middle
$E_4$	Secondary
$E_5$	Intermediate / Pre-University
$E_6$	First Degree (General)
$E_7$	Second Degree (Post Graduate) General
$E_8$	Higher (General) First and Second Degrees together
$E_9$	Higher Professional

#### *Rates of Return*

$R_0$	Unadjusted (crude)
$R_1$	Adjusted for wastage in education
$R_2$	Adjusted for wastage and growth in incomes
$R_3$	Adjusted for wastage, growth in incomes, and unemployment.
$R_4$	Adjusted for wastage, growth in

#### *Others*

AHC	Stock of active human capital
AHCI	Index of stock of active human capital
THC	Stock of total human capital
THCI	Index of stock of human capital.