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**IS HUMAN CAPITAL AN IMPORTANT DETERMINANT OF EARNINGS  
IN SMALL MANUFACTURING AND RETAIL FIRMS IN INDIA?**

By

**Richard L. Shortlidge, Jr.**

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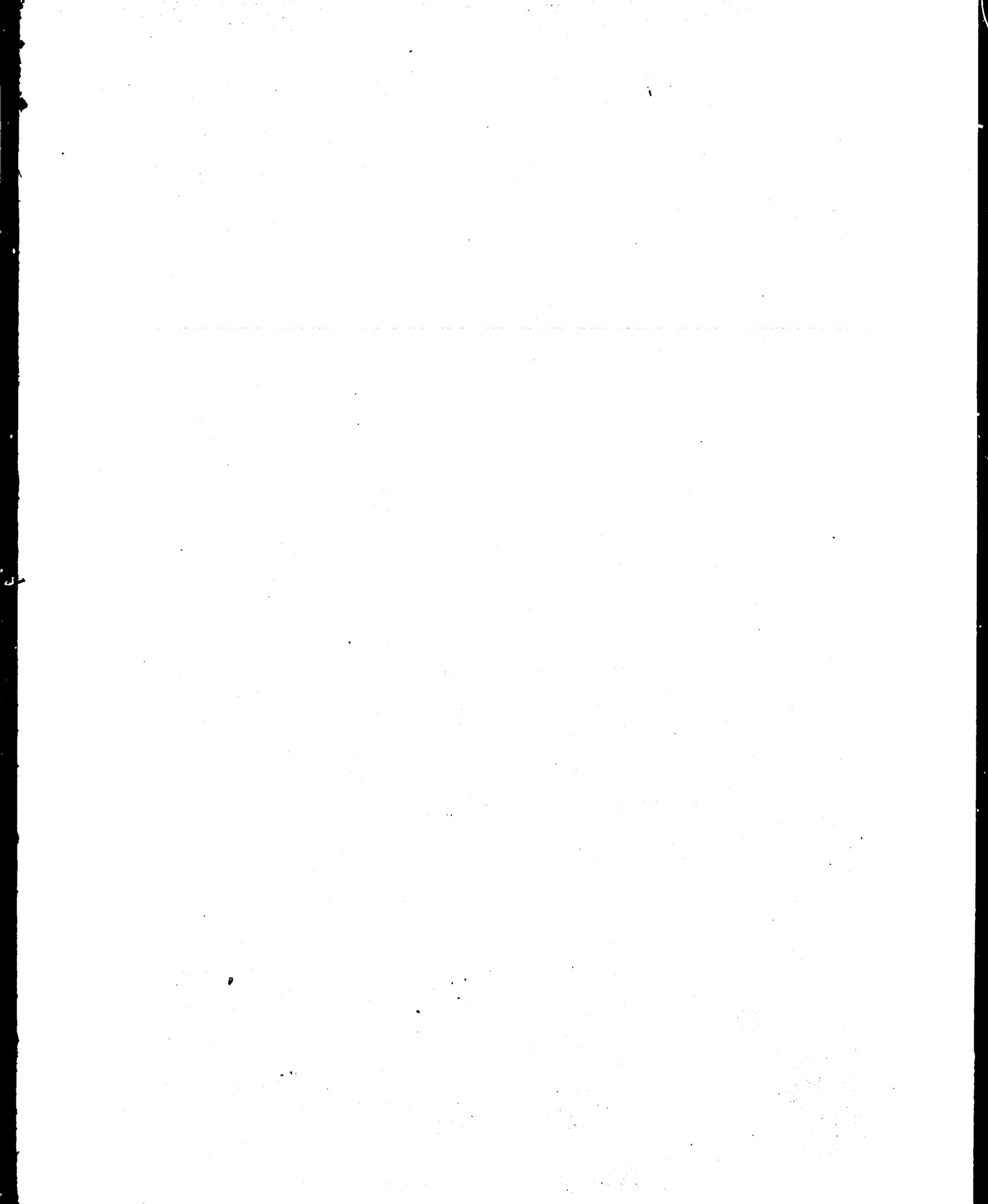
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This paper is part of a larger series which includes papers from previous AID research contracts concerned with the role and function of agricultural prices in economic development, and growing from that, concern for the impact of new technology on rural employment and income distribution. A list of these publications may be obtained by writing to Cornell University-USAID Technological Change in Agriculture Project, Department of Agricultural Economics, Cornell University, Ithaca, New York 14853. Copies of the report summarized above may be obtained from the same source.

## Table of Contents

	<u>Page</u>
I. THE DATA. . . . .	2
II. THE EARNINGS FUNCTION. . . . .	3
III. THE REGRESSION RESULTS. . . . .	6
Effect of Education on Earnings. . . . .	6
Effect of Experience on Earnings. . . . .	8
Education and Experience as Complements. . . . .	8
General Experience and Firm Experience as Substitutes. . . . .	10
Control Variables. . . . .	10
IV. SUMMARY AND POLICY IMPLICATIONS. . . . .	12

This paper was prepared for presentation at the Economic Development Session of the Econometric Society, ASSA Meetings, December 28-30, 1975 in Dallas, Texas. The author is presently at the Center for Human Resource Research, College of Administrative Science, The Ohio State University. However, the research on which this paper is based was carried out by the author while at Cornell University. The research was funded under a contract between Cornell University and the United States Agency for International Development (Contract No. AID/csd-2805) entitled, "The Impact of New Technology on Rural Employment and Income Distribution." The author is grateful for the valuable guidance provided by John W. Mellor and Vladimir Stoikov while the author was at Cornell. In addition, the author wishes to thank his colleagues Arvil V. Adams, John T. Grasso, Carol L. Jusenius, Andrew I. Kohen, Gilbert Nestel, and Steven Sandell for their helpful comments on an earlier draft of this paper.



Is Human Capital an Important Determinant of Earnings  
in Small Manufacturing and Retail Firms in India?

By

Richard L. Shortlidge, Jr.

Numerous studies have investigated the relationship between education and earnings in India.<sup>1</sup> However, these studies have been limited to large macro data sets, narrowly defined subsets of college educated workers, civil service employees, or large scale industries found in metropolitan India. Virtually ignored has been the role of human capital in the determination of earnings for workers employed in the numerous small scale manufacturing, wholesale, and retail firms which are representative of India's urban nonagricultural, noncivil service labor force. This study, therefore, focuses on the role of human capital as a determinant of earnings within this sector.

The human capital variables are education, firm-specific experience, occupation-specific experience, and general experience. The earnings function modeled is analogous to one used by Stoikov (1973) in his study of earnings within the Japanese economy. As in the Stoikov paper, information is generated on the marginal rates of substitution between general and firm-specific experience given both a level of educational attainment and earnings. Also, the paper explores the complementarities between education and experience. The study yields six major conclusions. First, there is a threshold minimum level of education above which education leads to increases in earnings. Below this level, the estimated marginal product of education is actually negative. Above it the marginal product of education is positive and increases at a constant rate. Second, there are strong complementarities between education and both years of firm-specific and years of general experience. Thus, the incremental payoff to one year of experience varies directly with the number of years of school completed. Third, while there are increasing returns to education, there are diminishing returns to general experience. Fourth, the elasticity of substitution between general experience and firm-specific experience was constant for all levels of education. Furthermore, it took on average less than a year of firm experience to substitute for a year of general experience. Fifth, rapid agricultural development appears to positively affect wages in the nonagricultural sector. Sixth, there appear to be economies of scale among firms in the retail and wholesale trades in India.

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<sup>1</sup> Blaug, Layard, and Woodhall, 1969; Gounden, 1967; Harberger, 1965; Kothari, 1967; Paul, 1972; Shortlidge, 1974; and Shortlidge, 1975.

The paper is divided into four sections. The first section briefly describes the data. The second presents the equation to be estimated and discusses the hypothesized relationship between earnings and the explanatory variables. The third discusses the results in detail and the fourth contains a brief recapitulation of the major findings and their policy implications.

## I. THE DATA

The data for this analysis were collected by the author between March and July of 1971. Four urban communities in western Uttar Pradesh were surveyed.<sup>2</sup> The communities selected included three block headquarters (Bisauli, Rudrapur, and Wazirganj) and one district headquarter (Badaun). Both Bisauli and Wazirganj are block headquarters within Badaun district, whereas Rudrapur is a block headquarter in Nainital district. Rudrapur was chosen because of its location in one of the most progressive agricultural areas of western Uttar Pradesh state.

All nongovernmental manufacturing, wholesale, and retail establishments in these four communities were enumerated.<sup>3</sup> The firms were classified into 14 categories which were determined by their products sold, manufactured, or service performed.<sup>4</sup> From this firm classification a 20 percent stratified random sample was drawn. The resulting sample included 93 firms in Badaun, 34 firms in Bisauli, 79 firms in Rudrapur, and 21 firms in Wazirganj. Data on all employees, including the owner if he worked in the firm, were gathered by means of a personal interview.

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<sup>2</sup> The four communities surveyed, were Rudrapur, Bisauli, Wazirganj, and Badaun.

<sup>3</sup> Establishments controlled by the state of Uttar Pradesh or the Government of India were excluded. This eliminated educational facilities, banks, most hospitals, and government agencies.

<sup>4</sup> The categories are: (1) agricultural equipment suppliers and repairers; (2) general stores; (3) clothing and yard good dealers; (4) shoe and leather goods; (5) kirana (staple goods) shops; (6) rope and bamboo shops; (7) medical shops; (8) bookstores; (9) iron shops; (10) other consumer shops such as bicycle and radio shops; (11) hotels and restaurants; (12) grain dealers; (13) flour, rice, and sugar mills; and (14) sawmills.

However, in this analysis, only data on male employees exclusive of owners were utilized.<sup>5</sup> This resulted in a usable sample for the regression analysis of 439 individuals for whom complete data were available.<sup>6</sup> The distribution of the sample by city and firm category is given in Appendix Table 1.

According to the 1971 Census of India, the majority of India's, as well as Uttar Pradesh's, urban population resided in cities with populations of 100,000 or more.<sup>7</sup> However, the majority of the cities and towns in India had populations under this figure. In this study, the largest urban community was the city of Badaun with a population between 50,000 and 99,000. The smallest was Wazirganj with a population between 5,000 and 9,999.<sup>8</sup> Therefore, this analysis is characteristic of a cross-section of India's small and medium sized urban communities. In both the districts of Badaun and Nainital, slightly more than one third of the districts' nonagricultural labor forces were employed in manufacturing, trade, and commerce--the sectors covered by this analysis. Only the service sector, including public employment had proportionally more workers. Thus, this analysis encompasses a major share of the noncivil service labor force of these four urban communities.

## II. THE EARNINGS FUNCTION

Conventional economic theory assumes that wages reflect the value of labor's marginal product. This assumption is the essential underpinning for the theoretical and empirical human capital research which has examined the acquired and ascriptive characteristics of individuals which affect their productive capacities. In these analyses, wages or earnings serve

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<sup>5</sup> The original plan was to use the information for owners as well. However, the unreliability of the earnings information precluded this. In the personal interview employers were asked to estimate the earnings they would pay to someone hired to do their job. This strategy represented an attempt to measure the value of their labor to the firm exclusive of any rent attributable to their entrepreneurial skills and any return to their investment in the firm. Unfortunately, responses to this question by many employers were judged by the author to be invalid.

<sup>6</sup> The actual number of male and female employees was 444. One employee was excluded from the regression analysis because of missing information on one of the independent variables. Since the data contained only four female employees, these observations were also removed.

<sup>7</sup> Census of India, 1971.

<sup>8</sup> The population of Rudrapur was between 20,000 and 49,999. The population of Bisauli was between 10,000 and 19,999.

as proxies for the valuation of labor's productivity.<sup>9</sup> The inputs that often go into an empirical analysis of the production of human capital are ability, education, formal and informal training, and health. In this study, the relationships between productivity and education as well as informal training as measured by firm-specific experience, occupation-specific experience, and general experience are explored in detail. The data preclude an analysis of the effects of health, ability, and formal training. Therefore, an individual's productivity (P) as measured by monthly earnings is hypothesized to be a function of the number of years of schooling completed (ED), the amount of firm-specific experience (FIRMEXP), the amount of occupation-specific experience (OCCEXP), and the amount of general experience (GENEXP):

$$P = f(ED, FIRMEXP, OCCEXP, GENEXP, CONTROL). \quad (1)$$

In addition to these human capital measures, a set of variables control is included to measure the effects of factors such as hours worked, type of job performed, and job location which are likely to affect earnings through their correlation with the human capital variables. Since the condition of diminishing marginal product is assumed to apply in the production of human capital, each of the human capital variables is squared. Furthermore, since the acquisition of education itself may contribute to the capacity to efficiently utilize other forms of human capital, education is interacted with the three experience variables. The definitions of the independent and dependent variables along with their means, standard deviations, and expected signs are given in Table 1.

Before proceeding to the empirical results, a discussion of the variables classified as controls is in order. First, working in Rudrapur as opposed to the other cities in the model is expected to be positively related to earnings. Rudrapur is located in a progressive agricultural region of north India and western Uttar Pradesh state. The doubling of the city's population in the period 1961 to 1971 reflected its growing importance as a local grain and commercial center. This rapid expansion may have shifted outward the demand function, both relative to local labor supply conditions and to other less dynamic communities, for nonagricultural manpower. Such a situation would lead to a short run wage advantage in favor of workers in Rudrapur.

Second, there exists a positive correlation between educational attainment and kinship with the firm's owner. If employers pay differential amounts to relatives and nonrelatives, the omission of this variable would bias the estimated relationship between earnings and education. Third, individuals who worked part time on average had fewer years of general experience.

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<sup>9</sup> For a fairly recent review of the human capital literature, refer to Mincer (1970). The theory itself owes much to the early work of Schultz (1962) and Becker (1964).

TABLE 1

## DEFINITIONS, MEANS, AND STANDARD DEVIATIONS FOR VARIABLES USED IN EARNINGS FUNCTION

Variables	Definitions	means	Standard Deviations	Hypothesized Signs
Rudrapur	1=Employed in city of Rudrapur; 0=employed in Badaun, Bisauli, or Wazirganj	0.38	0.48	+
Kinsman	1=Related to firm's owner; 0=Otherwise	0.19	0.39	+
Part time	1=Employed Part time; 0=Otherwise	0.06	0.24	-
Firm Size	Actual number of employees working in firm	7.80	10.54	+
Apprentice	1=Employed as an apprentice; 0=Otherwise	0.12	0.33	-
Manager	1=Employed as a manager or supervisor; 0=Otherwise	0.09	0.28	+
Craftsman	1=Employed as a craftsman, operator, or technician; 0=Otherwise	0.33	0.47	+
Education	Actual years of schooling completed	6.26	4.74	+
Education <sup>2</sup>	Actual years of schooling completed squared	61.60	62.45	-
Firm Experience	Actual years employed with survey firm	3.59	5.62	+
Firm Experience <sup>2</sup>	Actual years employed with survey firm squared	44.38	199.60	-
Occupational Experience	Actual years worked in survey occupation	1.76	5.44	+
Occupational Experience <sup>2</sup>	Actual years worked in survey occupation squared	32.60	178.75	-
General Experience	Actual years worked after completing school	14.93	7.93	+
General Experience <sup>2</sup>	Actual years worked after completing school squared	285.69	332.51	-
(Education) (Firm Experience)	Interaction variable	21.02	34.53	+
(Education) (Occupational Experience)	Interaction variable	10.71	38.92	+
(Education) (General Experience)	Interaction variable	98.61	99.89	+
(Firm Experience) (Occupational Experience)	Interaction variable	2.64	8.87	+
(Firm Experience) (General Experience)	Interaction variable	53.03	84.16	+
(Occupational Experience) (General Experience)	Interaction variable	25.82	87.12	+
Monthly Earnings	Actual Gross Monthly Earnings in Rupees	153.64	153.64	

Total Number of Sample Cases 439.

Fourth, there is a positive relationship between the size of a firm's labor force and the amount of prior general experience acquired by its employees. That is, larger firms tended to have more experienced labor forces on average. Since a firm's size may yield economies of scale which raise productivity, the failure to include this variable might result in an overstatement of the net effect of general experience. Fifth, occupational skills may be acquired by serving as an apprentice. Since this learning is of a general nature, human capital theory posits that the individual pays for it through reduced earnings. Furthermore, apprentices are often individuals with limited experience and education, a relationship that might bias both the education and general experience coefficients in the absence of the apprenticeship variable. Sixth, since an individual's earnings reflect the nature of the work performed (e.g., compensation for administrative functions) and physical capital complements, two zero-one variables are included to measure the impact of working as a manager or a craftsman.

### III. THE REGRESSION RESULTS

A quadratic equation consisting of the four human capital measures, their squared and interactive terms, and the six control variables was estimated by ordinary least squares with gross monthly pay in rupees as the dependent variable.<sup>10</sup> The regression results are presented in Table 2. The model explained 47 percent of the variance in monthly earnings and produced a statistically significant fit with an F-ratio of 19.52.

Effect of Education on Earnings. Since the partial derivative of earnings with respect to education is a function of years of schooling completed, years of firm experience, years of occupational experience, and years of general experience, it becomes necessary to hold the experience variables constant in order to discuss the impact of a year of education on earnings. If the experience variables are valued at their respective means, the following conclusions may be reached about the relationship between education and earnings. First, the marginal product of education is actually less than zero if the years of schooling completed is under 3.5 years. Second, after achievement of this threshold level of education the marginal product is positive and increases at a constant rate.<sup>11</sup>

<sup>10</sup> A natural log form of the same equation was also estimated. The fit proved to be neither better nor worse. Because of the ease of directly estimating complementarities and substitutabilities among the human capital variables using the nonlog additive model, this model was chosen over the log one.

<sup>11</sup> One might argue that the positive effect of education on earnings above the threshold merely reflects a credentialing phenomenon and does not actually reflect education's impact on productivity. For a discussion of the credentialing phenomenon or screening hypothesis and the effect of omitting ability, see Taubman and Wales (1973) and Layard and Psacharopoulos (1970).

TABLE 2  
REGRESSION RESULTS: OLS ESTIMATES OF MONTHLY EARNINGS

Variables	Without Interactions		With Interactions	
	Regression Coefficients	t-statistics	Regression Coefficients	t-statistics
Constant	1.25	0.05	29.28	1.08
Rudrapur	49.22**	4.12	51.43**	4.33
Kinsman	-43.15**	-2.67	-35.64*	-2.26
Part time	-46.52*	-1.94	-43.22*	-1.82
Firm Size	0.81	1.47	0.89*	1.64
Apprentice	-75.77**	-4.04	-74.83**	-4.01
Manager	95.63**	4.43	77.06**	3.56
Craftsman	38.54**	2.94	36.14**	2.80
Education	-13.51**	-3.93	-23.95**	-5.85
Education <sup>2</sup>	1.82**	6.73	1.60**	5.77
Firm Experience	4.74*	2.04	2.11	0.47
Firm Experience <sup>2</sup>	-0.003	-0.04	0.05	0.63
Occupational Experience	6.18**	2.52	5.49	1.04
Occupational Experience <sup>2</sup>	-0.09	-1.23	-0.07	-0.98
General Experience	5.86**	2.60	6.49**	2.68
General Experience <sup>2</sup>	-0.05	-0.89	-0.12*	-2.24
(Education) (Firm Experience)			0.97**	3.47
(Education) (Occupational Experience)			0.19	0.71
(Education) (General Experience)			0.61**	3.79
(Firm Experience) (Occupational Experience)			1.10	1.07
(Firm Experience) (General Experience)			-0.22	-1.30
(Occupational Experience) (General Experience)			-0.12	-0.52
N	439		439	
F-Ratio	24.42		19.52	
R <sup>2</sup> (Adjusted)	.45		.47	

\*Significant at  $.01 < \alpha \leq .05$ .

\*\*Significant at  $\alpha \leq .01$ .

Effect of Experience on Earnings. The formal educational system represents one means of acquiring human capital. It may also be acquired through participation in the labor market. Since the individual is circumscribed and limited by his own ability to assimilate and utilize human capital, human capital theory posits that as the individual's stock of human capital rises, each increment of human capital is valued less than a previous unit. The behavior of the general experience variable, which may be viewed as a proxy for nonspecific and informal training received through work, suggests that the marginal product of general experience declines at a constant rate as the number of years worked increases.<sup>12</sup> If other forms of experience and education are held constant at their respective means, the effect of general experience on earnings reaches a maximum at about 40 years in the labor force. Therefore, for the average Indian worker in the retail trades, the marginal product of general experience remains positive over a substantial portion of his tenure in the labor force. As the next section on complementarities will show, this maximum varies directly with the number of years of schooling completed.

Education and Experience as Complements. The complementarities between educational attainment and experience are given in Table 3. These results show the effects of the various forms of experience by level of educational attainment controlling for the other variables in the model. Both firm and general experience exhibited strong complementary relationships with the level of schooling achieved.<sup>13</sup> Thus, the marginal product of a year of either form of experience varied directly with the number of years of schooling completed. As a consequence the estimated earnings profiles were steeper the greater the level of education. Furthermore, peak earnings were reached at later points in the life cycle the better educated the individual. Both of these observations are consistent with human capital theory.

For workers without any education, there appears to be a higher incremental gain from experience which is related to a specific occupation. Therefore, uneducated workers would have an incentive to pursue a career path which maximized the development of skills within a particular occupation.

On the other hand, as one advances up the educational ladder, the marginal gain from a year of firm-specific experience was greater than the marginal gain from a year of general experience. Thus, the higher

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<sup>12</sup> The coefficients for both firm-specific and occupation-specific experience were nonsignificant. A comparison of their coefficients and standard errors in the interaction model with those obtained in a model without interactions suggests that their nonsignificance, particularly in the case of occupation-specific experience, may be related to collinearity difficulties in the interaction model.

<sup>13</sup> Stoikov (1973) found similar results for Japan.

**TABLE 3**  
**COMPLEMENTARITIES BETWEEN EARNINGS, GENERAL EXPERIENCE,**  
**OCCUPATIONAL EXPERIENCE, AND FIRM EXPERIENCE FOR**  
**DIFFERENT LEVELS OF EDUCATION**

Type of Experience	Level of Education	Relationship to Earnings (Rupees Per Month)
General <sup>a</sup>	No School	121.09 + 4.79GEN - .12GEN <sup>2</sup>
General <sup>a</sup>	Primary (5 years)	70.34 + 7.84GEN - .12GEN <sup>2</sup>
General <sup>a</sup>	Middle (8 years)	78.29 + 9.67GEN - .12GEN <sup>2</sup>
General <sup>a</sup>	High School (10 years)	99.59 + 10.89GEN - .12GEN <sup>2</sup>
General <sup>a</sup>	Intermediate (12 years)	133.69 + 12.11GEN - .12GEN <sup>2</sup>
General <sup>a</sup>	College (15 years)	208.84 + 13.94GEN - .12GEN <sup>2</sup>
Firm <sup>b</sup>	No school	108.24 + 6.51FRM + .05FRM <sup>2</sup>
Firm <sup>b</sup>	Primary (5 years)	48.49 + 11.36FRM + .05FRM <sup>2</sup>
Firm <sup>b</sup>	Middle (8 years)	51.04 + 14.27FRM + .05FRM <sup>2</sup>
Firm <sup>b</sup>	High School (10 years)	68.74 + 16.21FRM + .05FRM <sup>2</sup>
Firm <sup>b</sup>	Intermediate (12 years)	99.24 + 18.15FRM + .05FRM <sup>2</sup>
Firm <sup>b</sup>	College (15 years)	168.99 + 21.06FRM + .05FRM <sup>2</sup>
Occupational <sup>c</sup>	No School	91.84 + 10.39OCC - .07OCC <sup>2</sup>
Occupational <sup>c</sup>	Primary (5 years)	51.59 + 11.34OCC - .07OCC <sup>2</sup>
Occupational <sup>c</sup>	Middle (8 years)	65.84 + 11.91OCC - .07OCC <sup>2</sup>
Occupational <sup>c</sup>	High School (10 years)	91.34 + 12.29OCC - .07OCC <sup>2</sup>
Occupational <sup>c</sup>	Intermediate (12 years)	129.64 + 12.67OCC - .07OCC <sup>2</sup>
Occupational <sup>c</sup>	College (15 years)	211.09 + 13.24OCC - .07OCC <sup>2</sup>

<sup>a</sup>Assumes 5 years of firm experience and 5 years of occupational experience. All other variables in the equation, exclusive of education and general experience, are evaluated at their respective means.

<sup>b</sup>Assumes 5 years of general experience and 5 years of occupational experience. All other variables in the equation, exclusive of education and firm experience, are evaluated at their respective means.

<sup>c</sup>Assumes 5 years of general experience and 5 years of firm experience. All other variables in the equation, exclusive of education and occupational experience, are evaluated at their respective means.

the worker's educational attainment, the greater was his monetary incentive to remain employed within the firm. This suggests that job tenure in India's private sector may be positively related to education.

General Experience and Firm Experience as Substitutes. Any given level of earnings may be achieved through various combinations of general and firm experience. In Table 4, the combinations of general and firm experience which will maintain the mean monthly earnings of workers by level of education have been estimated. For example, the mean monthly earnings for workers with primary school education were Rs. 107.32. These earnings could be achieved by a combination of either 2.00 years of general experience and 6.72 years of firm experience or 12.00 years of general experience and 1.07 years of firm experience. At each level of education, it took less than a year of firm experience on average to substitute for a year of general experience. On the basis of the estimated isoquants in Table 4, it appears that the elasticity of substitution between these two types of experience was constant across the various levels of education. Thus, regardless of the level of education, a one year reduction in general experience could be compensated for by a seven month increase in firm experience.

Control Variables. The behaviors of two of the control variables are particularly interesting. First, the earnings of workers in Rudrapur were found to be significantly above those of workers in the three Badaun communities. Keeping in mind that the estimated earnings function represents a reduced form system, it appears that in the short run, the equilibrium between supply and demand favored higher wages in Rudrapur. Based upon what is known about the rapid growth of Rudrapur during the post 1961 period and the prosperity of its local agricultural community relative to Badaun, it seems reasonable to argue that rising income in the agricultural sector has stimulated an expansion in the nonagricultural sector for more consumer goods and services as well as agricultural machinery (e.g., tractors).<sup>14</sup> This suggests an outward shift in the demand for labor by local firms. This shift in demand combined with short run labor scarcities would explain the earnings advantage that favors employment in Rudrapur. Second, earnings varied directly with the number of workers employed within the firm. Therefore, it would appear that

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<sup>14</sup> Arvil V. Adams has suggested an alternative explanation for this coefficient. In a dynamic situation in which both the nonagricultural and agricultural sectors are competing for labor, the labor supply function in the nonagricultural sector may become less elastic as employment opportunities improve in agriculture. Therefore, if one assumed that the demand functions for Badaun and Rudrapur were the same, a more inelastic supply function for Rudrapur would favor the existence of an earnings differential.

TABLE 4

**SUBSTITUTION BETWEEN GENERAL EXPERIENCE AND  
FIRM EXPERIENCE CONTROLLING FOR  
EDUCATION AND MONTHLY EARNINGS**

Level of Education (Mean Monthly Earnings)	General Experience (Years)	Firm Experience (Years)	Level of Education (Mean Monthly Earnings)	General Experience (Years)	Firm Experience (Years)
<u>No School</u> (Rs. 120.29)	0.00	4.90	<u>High School</u> (Rs. 173.71)	0.00	9.11
	2.00	3.69		2.00	8.01
	4.00	2.46		4.00	6.91
	6.00	1.18		6.00	5.79
	7.77	0.00		8.00	4.67
<u>Primary School</u> (Rs. 107.32)	0.00	7.82	10.00	3.53	
	2.00	6.72	12.00	2.39	
	4.00	5.62	14.00	1.23	
	6.00	4.51	16.10	0.00	
	8.00	3.38	<u>Intermediate College</u> (Rs. 222.48)	0.00	9.45
	10.00	2.23		2.00	8.34
	12.00	1.07		4.00	7.23
13.80	0.00	6.00		6.11	
<u>Middle School</u> (Rs. 137.63)	0.00	8.70	8.00	4.98	
	2.00	7.60	10.00	3.84	
	4.00	6.50	12.00	2.69	
	6.00	5.39	14.00	1.53	
	8.00	4.27	16.00	0.36	
	10.00	3.13	16.42	0.00	
	12.00	1.99	<u>College</u> (Rs. 319.44)	0.00	9.83
	14.00	0.83		2.00	8.71
	15.40	0.00		4.00	7.59
		6.00		6.46	
		8.00		5.32	
		10.00		4.18	
		12.00		3.02	
		14.00	1.86		
		16.00	0.68		
		17.15	0.00		

larger firms are able to take advantage of economies of scale in the production process which result in higher earnings for their workers.

Being employed as a manager or a craftsman resulted in earnings significantly higher than those of clerks and manual laborers. Furthermore, both part-time employment and apprenticeships reduced earnings significantly. Contrary to expectations, workers who were related to the employer received on average earnings which were significantly lower than those of other workers.

#### IV. SUMMARY AND POLICY IMPLICATIONS

The absence of diminishing returns to investments in education indicates that there exists in India powerful monetary incentives to continue schooling up to the point that the marginal gain from a year of schooling equals its marginal cost. Furthermore, the marginal products of a year of firm and a year of general experience increase as the number of years of schooling increases. Thus, education contributes to the ability of a worker to assimilate and efficiently utilize informal training received in the labor market. These results support the conclusion that education plays an important role in the determination of wages within India's nonpublic sector. Since this sector is generally unaffected by wage boards and unions, these results suggest that there is a direct relationship between labor productivity and education. If education did not increase the productivity of labor, it certainly would not pay in an economy with an abundance of unskilled labor to reward differentially individuals with varying levels of education. It is of interest that in general conversations with employers in the survey, they cited economic reasons more frequently than noneconomic ones for hiring the individuals they employed. For them, education was important because it enhanced an employee's ability to comprehend a job assignment, to interact favorably with customers from various socio-economic strata, and to be able to handle complex tasks involving the manipulation of weights and measures.

The educational threshold raises some interesting questions about what forces are operating to cause a negative marginal product for most of the years spent in primary school. Two explanations seem plausible. First, the quality of primary education in India may be such that the skills necessary to increase an individual's productivity to a firm are simply not acquired at this level. Therefore, it is only after four years of schooling that education begins to impart marketable skills. If this were the case, the policy prescription might include substantial investments in primary school to upgrade its quality. Second, an extension of Blaug's (1969) educational inflation argument may apply. Although education enhances productivity, educated workers in a surplus labor situation compete for jobs

whose skill requirements are actually below their capabilities. The end result is an underutilization of educated manpower. The policy implication of such a relationship would be two-fold. First, substantial subsidization of education to offset the direct and indirect costs of education to low socioeconomic classes might be necessary to improve their competitive advantage. Second, efforts might be directed toward greater control over the hiring of "overly" qualified individuals. Given the size of this sector in the Indian economy, the massive intervention by government which would be necessary to monitor hiring practices, and the ambiguity of identifying appropriate job-qualification matches, this policy prescription would be both costly and probably ineffective.

APPENDIX TABLE 1  
DISTRIBUTION OF EMPLOYEES BY FIRM CATEGORY AND CITY  
(NUMBER OF FIRMS SURVEYED IN PARENTHESES)

Kind of Firm	City			
	Badaun	Bisauli	Rudrapur	Wazirganj
<b>Retail and Service</b>				
Agricultural supplies and equipment repairs (including automobiles)	43 (22)	12 ( 7)	62 (14)	0 ( 1)
General stores (chinaware, glassware, canned foods, cosmetics, toys, cooking utensils)	9 ( 5)	4 ( 2)	5 ( 6)	6 ( 2)
Clothing and yard goods	32 (14)	6 ( 3)	6 ( 8)	3 ( 3)
Shoes and leather goods	12 ( 4)	0 ( 1)	1 ( 3)	0 ( 1)
<u>Kirana</u> (staple goods) stores (flour, rice, sugar, spices)	17 (10)	3 ( 5)	8 (10)	3 ( 2)
Rope and bamboo merchants	1 ( 1)	0 ( 0)	1 ( 1)	0 ( 0)
Medical shops	5 ( 1)	0 ( 1)	2 ( 3)	0 ( 2)
Bookstores	5 ( 3)	0 ( 0)	1 ( 1)	1 ( 1)
Iron shops, (tools, nails, piping, iron cookware)	1 ( 2)	3 ( 1)	2 ( 1)	0 ( 1)
Other consumer stores (bicycles, radios, watches, photography, furniture, gasoline stations, bakery, etc.) <sup>1</sup>	45 (22)	6 ( 6)	30 (15)	0 ( 1)
Hotels and restaurants	1 ( 1)	3 ( 3)	18 ( 2)	2 ( 1)
<b>Wholesale and Manufacturing</b>				
Grain merchants	20 ( 6)	2 ( 1)	14 (11)	6 ( 2)
Mills (flour, sugar, rice) and cold storage	9 ( 1)	2 ( 3)	16 ( 4)	8 ( 3)
Sawmills	1 ( 1)	4 ( 1)	0 ( 0)	3 ( 1)
Total number in sample <sup>2</sup>	201 (93)	45 (34)	166 (79)	32 (21)

<sup>1</sup> Also included in this category are some small scale manufacturers of consumer goods such as plastic bags and writing ink.

<sup>2</sup> The sample in this Table totals 444 cases whereas 439 cases are used in the regression analysis. The difference is explained by missing information on one of the independent variables which resulted in the exclusion of this and the removal of four female respondents.

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