



DOES EDUCATION DETERMINE EMPLOYMENT: PECULIARITIES OF THE INDIAN LABOUR MARKET

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Abstract:

This study tests the empirical relation between the education qualifications and employment status, for the Indian workers. It also examines the role of education in securing employment in specific industries. There is evidence that the education level has a significant and positive association with the employment status of a worker. More significantly, the probability of being engaged in regular (casual) employment improves (declines) with each incremental educational qualification. The less educated workers are more likely to be involved in low-paying and labour intensive industries, such as agriculture and mining. However, the workers belonging to the marginalized social groups (SC, ST and OBC), the female workers, and the rural workers, are at a considerable disadvantage in the Indian labour market.

Key words: Education, employment, labour market, India, NSSO

1. Introduction

The relationship between education attainment and employment opportunities is intuitively obvious. In the regular economic conditions, the workers with low education levels are usually suited to jobs with low task complexity or manual labour, whereas highly educated workers are engaged in specialized jobs with high task complexity. Even in the periods of low economic growth, and consequently low labour demand, the high-educated workers continue to maintain an advantage over the low-educated workers. This is because the skill-set of highly educated workers are generic and diverse, and therefore, they can outcompete the low-educated workers for the low skill jobs. Additionally, it is also easier for employers to impart specialized firm-specific knowledge to the high-educated workers. Education serves to enhance the skills and productivity of the workers, making them more valuable to their employers. It also serves as an effective signal of a worker's prowess to the prospective employers. De la Fuente and Ciccone (2003) found that increasing average education by one extra year would raise aggregate productivity by at least five per cent. Technological innovations

also favour skilled workers, as they increase the demand for skilled workers while replacing the labour intensive manual jobs (Chennells & Van Reenen, 1999). In the Indian context, the causal nexus between the level of education and employment opportunities has not been sufficiently examined. Moreover, owing to the peculiarities of the Indian demographics: world's largest youth population, highly skewed gender ratio, low literacy levels, and caste & religion based divisions, understanding the relationship between education and employment has become vitally important for the Indian policy makers. These factors confound the intuitive relation between education attainment and employment opportunities. For instance, among the Indian workers, membership of a certain social group may be stronger determinant of employment level than the educational qualifications of the individual.

India is widely claimed to be on the cusp of realizing the benefits of a “demographic dividend”. The demographic dividend refers to a period of two to three decades in which the overall fertility rate declines due to the reduction in child and infant mortality and a significant proportion of the population falls in the working age-group. This in turn spurs economic growth and reduces spending on non-working dependent population. Golley and Tyers (2013) estimate that this demographic dividend would increase India’s real per capita income by at least five per cent over the next three decades. Aiyar and Mody (2011) argue that the rapid economic growth of India, usually exclusively ascribed to the various economic reforms, is in fact largely a factor of the changes in the age structure of the Indian workforce. It is estimated that 70 per cent of the Indian population will be of the working age (15 to 59 years) by 2025. The gains of demographic dividend are transient, and do not last forever. To fully utilize the benefits of this demographic dividend window, India needs to overcome multiple challenges like a skewed sex ratio, social and political conflicts, poor infrastructure and unfavourable foreign investment climate and policies (James, 2011). However, the most serious challenge that is likely to adversely affect India’s human capital and the employability of its working population is the level and quality of education.

This study examines the linkage between the education level and employment pattern among the Indian workers. Specifically, we investigate the importance of education attainment in determining employment status of an individual. We also study the effects of geographical variations across states, membership of different social groups, disparity between the urban and rural population, and individual specific attributes like age and gender. This study also attempts to highlight the gap among the different social groups in terms of education level and employment status. The results have important policy implications, particularly in framing region-specific policies and central educational initiatives.

2. Review of literature

The linkage between education level and employment is one of the central tenets of labour economics. A considerable body of empirical and theoretical literature

attempts to establish the relationship between the level of education and the subsequent employment status or earnings. Several studies have found that education provides positive future returns, i.e., additional education results in additional earnings in the labour markets (Blundell, Dearden, & Sianesi, 2005; Chevalier, Harmon, Walker, & Zhu, 2004; Harvey, 2000; Robinson & Sexton, 1994). There are two competing economic theories to explain this empirically observed relationship: the Human Capital theory and the Signalling theory. Human Capital refers to the stock of knowledge that a particular worker has which contributes to his/her productivity. As human beings, we all have potential to acquire knowledge and learn new things throughout our lives. This knowledge can be innate or acquired depending on whether the knowledge has been present since birth or is been learned through experience respectively. The Human Capital theory argues that education imparts skills that serve to increase the productivity of an individual. The more productive individuals are able to generate a higher output which naturally translates into higher wages and better employment opportunities. The early works that supported the Human Capital based explanations were Schultz (1961), Becker (1994) and Mincer (1974). In contrast, the Signalling theory argues that education does not enhance human capital in any way; instead, it merely reflects the existing human capital. Therefore, according to the signalling theory, the potential employees would opt to send signal about their ability level by acquiring better educational credentials. While the education by itself may not enhance the productivity or skill of an individual, it conveys an informational value to the prospective employers about the ability of the individual. If the role of education is merely limited to signal the ability of an individual and not to enhance his productivity, education can be considered an inefficient form of signalling. Particularly since education is expensive in terms of time and effort.

Brown and Sessions (1999) compare the benefits of higher education among the privately employed and self-employed individuals. They found that the benefits were higher for privately employed individuals as compared to the self-employed individuals. This is consistent with signalling theory as the education level did not increase the productivity of self-employed individuals, but served as an effective signal to prospective employers resulting in more lucrative employment opportunities. The Human capital theory suggests that the number of years of education should be more important than acquiring the degree itself. However, the empirical evidence suggests that obtaining the degree has an economically significant effect on the earnings of the individual. Hungerford and Solon (1987) found that certificate completion were associated with economic returns even after controlling for the years of education. Groot and Oosterbeck (1994) argue that rapid completion of degree signals greater ability while spending significant duration without obtaining a degree signals lack of ability and therefore does not contribute towards future earnings. Both these studies tend to support the Signalling theory. Nonetheless, as Kjelland (2008) notes, from an individual's perspective, what matters is that earnings and employment opportunities are an increasing function of education attainment.

Another closely related strand of literature that attempts to explain the causality between education and employment is the sorting hypothesis (Arrow, 1973; Berg & Gorelick, 1970, p. 197; Spence, 1973; Stiglitz, 1975; Taubman & Wales, 1973). The sorting hypothesis suggests that education drives employment and earnings by reflecting the productivity related characteristics of the workers. It provides a more general explanation of the causal linkage between the education and employment than the Signalling hypothesis.

Several empirical studies emphasize on the role of education in determining the employment distribution. Using the Labour Force Survey data pooled from 1993 to 2001 for England Wales, Chevalier et al. (2004) estimate that every additional year of education increases the subsequent earnings by 10 per cent. Robinson & Sexton (1994) found that education has a strong positive influence on entrepreneurship in terms of self-employment success. Chen and Wu (2007) study the relationship between education and employment in the Chinese labour market. They found that development of higher education institutions has a positive influence on the employment. Aggarwal et al. (2011) found that higher educational attainment in long term reduces the propensity for workers to enter manual employment. Kingdon and Unni (2001) found that returns to education rise with the education level. The empirical evidence for the relationship between education attainment and employment (and earnings) is strong and robust across time and geographies. However, in the Indian context, the disparities based on social groups, gender and inter-regional development affect access to education and therefore influence the employment pattern. Since the socio-economic group of an individual is a key determinant of their level of education, the employment distribution is skewed in favour of the socially better-off sections. For instance, Borooh (2010) found evidence that upper-caste Hindus have better employment status than disadvantaged social groups, in the India labour market. Bhaumik & Chakrabarty (2009) compare the wages earned by Hindu and Muslim groups for the period 1987-2005. They found that the education differences are largely responsible for the difference in log earnings of the two religious groups. Unni and Sarkar (2012) found that returns on education are high, particularly for the disadvantaged social groups. Nevertheless, the education levels in these social groups remain low due to non-availability of schools in the local region, and a general perception that chances of obtaining regular employment are low even after obtaining the required education level. The minority enclave hypothesis claims that social groups respond to job market discrimination by building self-employed venture groups (minority enclaves). The minority enclave effect increases the proportion of self-employment in marginalized social groups. Das (2008) tested the minority enclave hypothesis in the Indian context and found some evidence in support of the hypothesis.

In the Indian context, another important factor, and one that influences both the level of education attainment and the employment opportunities, is a pervasive and entrenched gender bias. Sundaram and Vanneman (2008) study 409 Indian districts and show that females have significantly lower literacy levels as compared to males. Patkar (1995) highlights that Indian females suffer from low socio-economic status and

labour market inequalities. There are several other factors that contribute to low education levels in female population, namely, social discrimination and economic exploitation, engaging the girl child in domestic chores, low enrolment of girls in schools, early marriages and high dropout rates.

This study makes a number of important contributions to the literature. First, the literature that examines the relation between employment and education attainment for the Indian workers remains sparse. With one of the largest, and arguably one of the most diverse, labour markets in the world, testing this relation is of particular for the Indian policy makers. This study attempts bridge this gap in the literature. Second, it adjusts for the confounding effects of the various peculiarities of the Indian demographics. Specifically, it highlights the variations in employment status among the workers belonging to different social groups, as well as the gender and region based differences. Third, it is one of few studies to use the latest available dataset: the 68th round (year 2011-12) survey conducted by the NSSO. Fourth, it measures the cross-sectional variations in education level across the major industry divisions, with a specific emphasis on understanding the effect of education level on securing employment in a particular industry.

The remainder of this study is organized as follows: Section 3 describes the data source and various variables used in this study. Section 4 defines the econometric methodology. Section 5 discusses the empirical results. Section 6 provides the concluding remarks.

3. Data

This analysis uses the cross-sectional data provided by the NSSO for the year 2011-12. The NSSO collects detailed information on socioeconomic, demographic, agricultural and industrial subjects by carrying out surveys covering a large number of households as well as rural and urban enterprises. It conducted the 68th round survey for the period July 2011- June 2012, on the subject of employment and unemployment in India. It was the ninth quinquennial round in the series. The data used in this analysis has been extracted from the survey reports based on the schedule of enquiry provided by the NSSO. All the econometric models are estimated using a cross-sectional dataset of 34,335 workers surveyed in 2011-12, under the 68th round of survey conducted by the NSSO.

3.1 Classification of employment category (activity status)

In the NSSO reports, the concept of reference period is used in order to classify the workers into various employment categories or activity statuses. The survey uses three reference periods for this purpose: one year, one week, and each day of the week. Based on these reference periods, the survey report provides three different measures which are termed as the usual status, the current weekly status and the current daily status. In the "usual status" approach, the status of the activity on

which a person spent relatively longer time in the preceding 365 days (from the date of survey) is considered as the usual status activity of the person. Accordingly, a person is considered 'working or employed' if the person was engaged for a relatively longer time during the past year in any one or more work related activities (economic activities), including seeking or being available for work. Similarly, in the "current weekly status" approach, individuals are assigned a unique activity status with reference to a period of seven days preceding the date of survey.

This study uses the concept of "usual principal and subsidiary status" as it is the most liberal and widely used method. In this method, the principal activity status of a person is determined using the "usual status" approach using a reference period of 365 days. If a person has engaged in some other economic activity for a smaller time period in the reference period, that economic activity is used to determine the subsidiary status of the person. On the basis of employment status, the workers are categorized into three categories: self-employed workers, regular or salaried workers, and casual workers. The survey also includes information about the general education level of the workers.

3.2 Notations and descriptions of variables

Table 1 describes the various variables that have been used in used for the empirical analysis. In the Indian context, the gender, type of region (urban/non-urban), and social group variables are used as control variables may exert significant influence on the employment status of an individual, and therefore they have been used as control variables in this analysis. The age variable is used as an explanatory variable because as age increases, the employment status may improve due to an increase in the work experience. Workers are also more likely to be engaged in certain types of occupations at a certain age. Additionally, we include state specific dummies for state-specific characteristics. This helps in eliminating the effect of any state-level factors which may affect the distribution of workers across different industrial divisions. Note that there are vast disparities among different states in terms of access to education, employment opportunities, infrastructure level, among others factors.

Table 1 Description of the variables

Notation	Description
<i>INDUSTRY</i>	A set of dummy variables that take the value 1 when an individual is employed in a particular industry division and 0 otherwise.
<i>EMP_STATUS</i>	A set of dummy variables that take the value 1 when the individual belongs to a particular activity status and 0 otherwise.
<i>AGE</i>	Age of an individual.
<i>ALE</i>	Dummy variable that takes the value 1 for male workers and 0 otherwise.
<i>URBAN</i>	Dummy variable that takes the value 1 if the individual belongs to the urban region and 0 otherwise.

<i>ST</i>	Dummy variable that takes the value 1 if the individual belongs to the Schedule Tribe category and 0 otherwise.
<i>SC</i>	Dummy variable that takes the value 1 if the individual belongs to the Schedule Caste category and 0 otherwise.
<i>OBC</i>	Dummy variable that takes the value 1 if the individual belongs to other backwards castes and 0 otherwise.
<i>STATE</i>	A set of dummy variables that take the value 1 when an individual belongs to a particular state and 0 otherwise.
<i>EDU1</i>	Dummy variable that takes the value 1 if the individual is non-literate and 0 otherwise
<i>EDU2</i>	Dummy variable that takes the value 1 if the individual has some below primary level education and 0 otherwise
<i>EDU3</i>	Dummy variable that takes the value 1 if the individual has completed primary level education but has not completed middle level education and 0 otherwise.
<i>EDU4</i>	Dummy variable that takes the value 1 if the individual has completed middle level education but has not completed senior secondary level education and 0 otherwise.
<i>EDU5</i>	Dummy variable that takes the value 1 if the individual has completed senior secondary level education but has not graduate level education, and 0 otherwise.
<i>EDU6</i>	Dummy variable that takes the value 1 if the individual has an education level of graduate or above and 0 otherwise.

Notes: This table defines the different variables used in the econometric analysis.

For the industrial classification of workers, the 68th round survey of NSSO uses the National Industrial Classification (NIC-2008). This study classifies the workers into nine industry divisions based on the 3-digit NIC code. These industry divisions are listed in Table 2.

Table 2 Industrial divisions

Notation	Industry Description
I1	Agriculture and allied activities
I2	Manufacturing
I3	Electricity, Gas and Water Supply
I4	Construction
I5	Wholesale, Trade and Hotels
I6	Transport, Storage and Communication Services
I7	Financial, Insurance, Real Estate and Business Services
I8	Community, Social and Personal Services
I9	Mining and Quarrying

Notes: This table lists the various industry classifications used in this analysis.

4. Econometric methodology

The empirical analysis is divided into two parts. The first analysis tests the relation between education attainment and employment status. The second analysis examines the cross-sectional variations in the education levels across different industrial divisions. Each of these analyses is carried out using a series of probit regressions defined as follows.

4.1 Model 1: Testing the relation between employment status and education level

In order to examine the importance of educational background of workers in securing employment, I estimate three separate probit regressions, corresponding to three employment categories, namely, self-employed workers, regular workers, and casual workers. Specifically, in the first probit regression, the dependent variable is a dummy which takes a value of 1 if the individual is self-employed and 0 otherwise. Similarly in the second and third probit regressions, the dependent variables are dummy variables that take a value of 1 if the individual belongs to the regular and casual worker categories, respectively, and 0 otherwise. The independent variables include the education level and other control variables described in Table 1. The models are defined as

$$EMP_STATUS_k = \alpha_0 + \alpha_1 AGE + \alpha_2 MALE + \alpha_3 URBAN + \alpha_4 SC + \alpha_5 ST + \alpha_6 OBC + \alpha_7 EDU2 + \alpha_8 EDU3 + \alpha_9 EDU4 + \alpha_{10} EDU5 + \alpha_{11} EDU6 + \gamma STATE + \delta INDUSTRY$$

(1)

where EMP_STATUS_k with $k = \{\text{Self-employed, Regular or Casual worker}\}$ are the dummy variables that indicate the employment status. $\alpha_1, \alpha_2, \dots, \alpha_{11}$ are parameters, whereas γ and δ are vectors of parameters corresponding to the $STATE$ and the $INDUSTRY$ dummies, respectively. Note that the variable $EDU1$ has been dropped to avoid the dummy variable trap problem, and it serves as the base category for other education dummies.

4.2 Model 2: Role of education in securing an employment in a particular industry

In the second analysis, the role of education in securing employment in a particular industry division is examined by estimating nine separate probit regressions, corresponding to the nine industry divisions mentioned in Table 2. The model is defined as

$$INDUSTRY_k = \beta_0 + \beta_1 AGE + \beta_2 MALE + \beta_3 URBAN + \beta_4 SC + \beta_5 ST + \beta_6 OBC + \beta_7 EDU2 + \beta_8 EDU3 + \beta_9 EDU4 + \beta_{10} EDU5 + \beta_{11} EDU6 + \zeta STATE + \eta EMP_STATUS$$

(2)

where $INDUSTRY_k$, with k referring to the nine industrial divisions, are the dummy variables that indicate whether the individual is employed in a particular industry. $\beta_1, \beta_2, \dots, \beta_{11}$ are parameters, whereas ζ and η are vectors of parameters corresponding to the $STATE$ and the EMP_STATUS dummies, respectively.

The first model tests the hypothesis that higher education is associated with better-paying regular/salaried jobs. In general, the probability of one being in a regular wage job goes up with the level of education and experience. This is expected because the substitution possibilities between a regular worker and a casual worker are likely to be greater for simple jobs than the jobs that require a higher level of skill/education/training. Somewhat similar argument can be given for experience. While this relation may seem obvious, the impact of confounding factors such as discrimination based on gender, social groups and region, may well subsume the benefits of better education. The model tests the hypothesis that the propensity of being employed in a certain industry is affected by the education level of the worker. The skills and education requirements may vary depending on the type of the Industry. For instance, much higher education level may be required to be employed in financial services industry than in agriculture based occupations. Nevertheless, in the Indian labour market, the other control variables may exert a strong influence on the employment pattern. For instance, positive discrimination policies for the disadvantaged social groups, such as the reservation system and quota system of India, may lead them to have a better employment status. Similarly, the workers in the most backward states may have little access to jobs in the financial services sector, regardless of their education levels.

5. Empirical results and discussion

Table 3 presents the results for Model 1, i.e., the three probit regressions that model the conditional probability of being a self-employed, regular or casual worker. For each probit model, Table 3 provides the estimated coefficients and the marginal effects of the explanatory variables. The coefficients of the probit models have a limited interpretation, as the effect of one explanatory variable can only be measured if we fix the values of all other explanatory variables. However, a positive (negative) and significant coefficient indicates that an increase in the explanatory variable leads to an increase (decrease) in the estimated conditional probability of the dependent variable. A more meaningful interpretation of the effects of the explanatory variables can be inferred from the analysis of their marginal effects. The marginal effect of an explanatory variable measures the effect of a unit change of this variable on the conditional probability that the dependent variable equals one, holding all other explanatory variables constant at their respective sample means. Panel A reports the model estimates for the self-employed employment category. The coefficients of all education dummies ($EDU2$ to $EDU6$) are positive and significant.

Table 3 Employment status and education level: Parameter estimates for the probit models

Explanatory Variables	Panel A: Self-employed		Panel B: Regular/Salaried		Panel C: Casual workers	
	Coefficients	Marginal effect	Coefficients	Marginal effect	Coefficients	Marginal effect
<i>AGE</i>	0.00558** (0.00005)	0.00200	0.02011** (0.00007)	0.00403	-0.01919** (0.00005)	-0.00605
<i>MALE</i>	-0.49287** (0.00033)	-0.17667	0.26953** (0.00044)	0.05397	0.44160** (0.00035)	0.13923
<i>URBAN</i>	-0.33889** (0.00034)	-0.12148	0.92415** (0.00037)	0.18505	-0.47027** (0.00037)	-0.14826
<i>EDU2</i>	0.06315** (0.00054)	0.02264	0.23099** (0.00085)	0.04625	-0.11284** (0.00054)	-0.03557
<i>EDU3</i>	0.09648** (0.00048)	0.03458	0.35441** (0.00074)	0.07096	-0.20805** (0.00048)	-0.06559
<i>EDU4</i>	0.25165** (0.00045)	0.09021	0.41298** (0.00069)	0.08269	-0.40444** (0.00046)	-0.12751
<i>EDU5</i>	0.46669** (0.00046)	0.16729	0.52008** (0.00068)	0.10414	-0.74484** (0.00047)	-0.23483
<i>EDU6</i>	0.00291** (0.00061)	0.00104	1.27853** (0.00077)	0.25600	-1.40476** (0.00083)	-0.44288
<i>ST</i>	-0.17537** (0.00053)	-0.06286	-0.40796** (0.00077)	-0.08169	0.44355** (0.00057)	0.13984
<i>SC</i>	-0.59023** (0.00043)	-0.21157	-0.14805** (0.00053)	-0.02964	0.76615** (0.00046)	0.24155
<i>OBC</i>	-0.07902** (0.00038)	-0.02833	-0.13068** (0.00045)	-0.02617	0.26705** (0.00043)	0.08420
Constant Term	-0.13714** (0.00129)		-2.05361** (0.00175)		0.13273** (0.00133)	

Notes: ** indicates significance at 1 percent level. Standard errors are provided in the parentheses below the estimated coefficients. All the marginal effects are significant at 1 percent level.

This indicates that an educated worker is more likely to have a self-employed employment status than a non-literate worker. Additionally, the magnitude of the coefficients increases monotonically from *EDU2* (0.06315) to *EDU5* (0.46669). Therefore, as the education level increases, the propensity for being self-employed also increases. However, there is a decrease in the magnitude of coefficients from *EDU5* (0.46669) *EDU6* (0.00291), which indicates that the workers with graduate or above qualifications are less likely to be self-employed than workers with senior secondary education. In terms of the other control variables, all disadvantaged groups (*SC*, *ST* and *OBC*) as well as the male and urban workers are less likely to be self-employed, whereas the probability of being self-employed increases with age. The most significant marginal effects are observed for the *EDU5* (0.16729), *SC* (-0.21157), and *MALE* (-0.17667) variables. This means that holding all other variables constant (at their sample mean values), the probability of being self-employed for a worker with senior secondary education is 16.73 percentage points more than that of a non-literate worker. Similarly, for a *SC* worker, the probability of being self-employed is 21.16 percentage points more than that of a non-*SC* worker. Interestingly, male workers are less likely to be self-employed than the female workers. Far from being a positive sign, it betrays one of most troubling aspects of the Indian labour force. The organized labour market participation of the female workers in India is far lower than in other emerging countries. A majority of female workers tend to work in unproductive jobs like small-scale manufacturing or low-productivity agriculture, with more than a third being self-employed as unpaid helpers.

Panel B reports the model estimates for the regular employment category. As hypothesized, the education variables have a strong positive relationship with the probability of being in a regular job. Further, the magnitude of the coefficients of education variables increases monotonically, which indicates that the probability of being employed in a regular job increases with each incremental educational qualification. Negative coefficients for all three socially disadvantaged groups (SC, ST and OBC) indicate that the memberships these groups reduce the probability of securing a regular job. However, unlike the self-employed category, the urban and the male workers are more likely to have a regular job than their rural and female counterparts, respectively. This highlights the lack of access to regular jobs in the rural areas, as well as the lack of representation of the female workers in the organized labour market. The significant marginal effects are observed for the **EDU6** (0.2560) and **URBAN** (0.18505) variables. This implies that for a worker with graduate or above qualifications, the probability of having a regular job is 25.6 percentage points higher than that of a non-literate worker. Similarly, for an urban worker, the probability of securing a regular job is 18.51 percentage points higher than that of a rural worker. Therefore, one of the key focus areas for policy makers should be on improving the access to regular employment opportunities in the rural areas. For the socially disadvantaged groups, the marginal effects indicate that membership of these groups can exert a significant negative effect on the likelihood of obtaining a regular job. For instance, for the ST workers, the probability of having regular job is 8.17 percentage points less than that of the non-ST workers.

Panel C reports the model estimates for the casual workers category. The casual workers lack a regular employment, and are usual engaged in a series of short term jobs throughout the year. They are largely unorganized labour, who do not receive regular monthly salary, and are usually hired on daily or hourly basis. Unlike the regular workers, the casual workers do not get any security benefits from their employment; most of them do not have a written contract with their employers, and they usually face poor working conditions and very low wages. Not surprisingly, the education variables display strong negative relations with the likelihood of having a casual employment. Further, with the increase in the level of education, the magnitude of the coefficients of the education variables reduce monotonically. This indicates that the probability of being employed as a casual worker declines with each incremental educational qualification. The positive coefficients for all socially disadvantaged groups imply that these workers are more likely to be employed as casual workers than workers belonging to general castes. The positive coefficient for the male workers (0.44160) indicates that the male workers are more likely to be employed as casual workers than the female workers. This is expected because of physically demanding nature of these jobs. The negative coefficient for **URBAN** (-0.47027) variable suggests that the urban regions have better access to employment opportunities than the rural regions. The negative coefficient of the **AGE** (-0.01919) variable can be explained in two ways. First, with better work experience the workers are more likely to make a transition from low-paying casual employment to other employment categories.

Second, most of the casual employment comprises jobs requiring hard manual labour, and therefore may be ill-suited to older workers. All education variables have negative marginal effects, whereas all socially disadvantaged groups have positive marginal effects. The most significant marginal effects are observed for **EDU6** (-0.44288) and **SC** (0.24155). This implies that for a worker with graduate or above qualifications, the probability of being employed as a casual worker is 44.29 percentage points lower than that of a non-literate worker. Similarly, for a SC worker, the probability of having a casual employment is 24.16 percentage points higher than that of a non-SC worker. The results indicate that education plays a very important role in securing regular jobs rather than temporary or contractual jobs. However, the female workers and the workers belonging to socially disadvantaged groups are at a considerable disadvantage, and less likely to have a regular employment. Using the estimated probit models given in Table 3, I estimate the conditional probability of having a certain employment status for each of the education levels, holding all other explanatory variables at their respective sample mean. The results are provided in Table 4.

Table 4 Estimated probability of an employment status for different education levels

Education Level	Self-Employed	Regular	Casual
Non-literate	0.3832	0.0632	0.4811
Below primary	0.4076	0.0968	0.4367
Primary	0.4206	0.1198	0.3993
Middle	0.4820	0.1318	0.3258
Senior Secondary	0.5700	0.1991	0.1610
Graduate and above	0.3845	0.4018	0.0731

Notes: This table provides the estimated conditional probability of having a specific employment status, for different levels of education attainment.

It is evident that the level of education attainment plays an important role in securing regular employment. For instance, the probability of attaining regular employment is 6.32 per cent for a non-literate worker, which increases to 40.18 per cent for a worker with graduate and above qualifications. A reverse relation holds for the casual worker category. The probability of having a casual employment is the highest (48.11 per cent) for the non-literate workers, it steadily decreases as the education level improves, and it is the lowest (7.31 per cent) for the workers with graduate and above qualifications. Despite higher education levels, the likelihood of being engaged in casual employment is fairly high. This is largely a result of a general economic slowdown after the financial crisis of 2008. According to the World Bank's estimates, the GDP growth rate of India slowed down from 9.8% in 2007 to 5.1% in 2012. More significantly, it lead to low employment generation in sectors that require highly skilled workers. Additionally, due to poor quality of teachers and outdated curriculums, despite having higher educational qualifications, several workers may not have the skills required for the regular jobs. This encourages them to take up the casual job available in the market.

For the self-employed category, the difference between the different education levels is far less pronounced. Nonetheless, the probability of being self-employed increases steadily from the non-literate education level to the senior secondary education level. This is expected as more educated people are likely to view self-employment as a better opportunity where they enjoy their independence as well as financial gains and that too in a better working environment. The non-literate workers have a fairly high (38.32 per cent) probability of being self-employed workers. Usually, their choice for self-employment stems from a lack of alternative employment opportunities.

Table 5 presents the results for Model 2, i.e., the nine probit regressions that model the conditional probability of being employed in a specific industry division. As earlier, all explanatory variables were found to be significant at 1 per cent level. For brevity, we only report the marginal effects corresponding to each industry division, as they have a more useful interpretation than the coefficients of a probit model. All education variables have a positive marginal effect for I5 (Wholesale, Trade and Hotels), I7 (Financial, Insurance, Real Estate and Business Services) and I8 (Community, Social and Personal Services). Therefore, the degree of education attainment increases the probability of being employed in these industrial divisions. These is expected as above mentioned sectors, particularly financial services, insurance , trade and hotels, are high skill intensity sectors, which employ large number of professional and technical workers. The minimum educational requirements for these sectors are usually quiet high, and they recruit a large number of workers with graduate or above qualifications. Conversely, for I1 (Agriculture and allied activities), I4 (Construction), and I9 (Mining and Quarrying), all education variables show negative marginal effects, with just one exception, EDU2 for the Mining and Quarrying sector. This indicates that the likelihood of being employed in these sectors declines with increase in education qualifications. These results can be attributed to the fact that most of the jobs in these sectors are labour intensive and provide low level of compensations. Therefore, these sectors do not attract highly educated and skilled workers. Finally, for I2 (Manufacturing) and I6 (Transport, storage and communication services), the marginal effects of low education categories are positive, and those of higher education categories are negative. This indicates that these sectors require some minimum level of educational qualification; however, the workers with high educational qualifications may transition to better paying sectors like financial and business services. These results are in line with the 'Human capital' theory that argues that higher education is associated with better jobs. In the previous analysis, we observed that higher education increases an individual's probability of getting a regular job rather than a casual job. Similarly, the inter-industry analysis shows that higher education qualifications improve the probability of being employed in industries that requires highly skilled workers, with potentially better paying jobs.

Table 6 Industrial division of the worker and education level: Marginal effects of the explanatory variables

Explanatory Variables	Industrial Divisions								
	I1	I2	I3	I4	I5	I6	I7	I8	I9
AGE	-0.00282	-0.00277	0.00038	0.00051	0.00022	0.00392	0.00099	0.00124	-0.00042
MALE	-0.12426	-0.06974	0.00225	0.16073	0.07732	0.09143	0.00851	-0.03007	0.00539
URBAN	-0.52553	0.15178	0.00982	0.00192	0.10502	0.02554	0.03451	0.06642	-0.00069
EDU2	-0.00972	0.01254	0.00078	-0.01914	0.01843	0.01030	0.00120	0.00034	0.00167
EDU3	-0.04767	0.01815	-0.00029	-0.01686	0.04835	0.01581	0.01685	0.01068	-0.00042
EDU4	-0.03725	0.01784	0.00044	-0.03815	0.04771	0.01502	0.02116	0.03432	-0.00516
EDU5	-0.02598	-0.01397	0.00120	-0.08989	0.07660	0.00879	0.03310	0.05894	-0.00300
EDU6	-0.16482	-0.06235	0.00298	-0.17013	0.04509	-0.01297	0.06702	0.12778	-0.00391
ST	0.12906	-0.13825	-0.00115	0.04043	-0.07372	-0.01556	-0.01565	-0.00012	-0.00091
SC	0.00958	-0.06749	-0.00002	0.07858	-0.05484	0.00493	-0.00275	0.03221	0.00401
OBC	0.04224	-0.03366	-0.00184	0.01117	-0.01640	-0.00134	-0.00022	0.01887	0.00192

Notes: This table provides the marginal effects of the explanatory variables, for each industry division. All the marginal effects are significant at 1 percent level.

The **AGE** variable is used as a proxy for experience. The estimated coefficient of age is negative for I1 (Agriculture and allied activities), I2 (Manufacturing) and I9 (Mining and Quarrying) sectors. This indicates that the probability of being employed in these sectors declines with age (or experience). This can be attributed to the fact that as workers gain experience, they develop better skillsets, which makes them more suitable for skill-intensive sectors, such as financial services and hospitality. Moreover, these sectors are highly labour intensive, and therefore, ill-suited for older workers. The marginal effects of the **AGE** variable are positive for all other industrial divisions. These results are consistent with the previous analysis, where we found that the age of a worker improves the probability of securing a regular job, possibly due to better skills and work experience, whereas it was negatively related to casual employment.

The marginal effects for the **MALE** variable is negative for the I1 (Agriculture and allied activities), I2 (Manufacturing) and I8 (Community, social and personal services). This indicates that female workers are more likely to be engaged in these sectors than male workers. The difference is most pronounced in agriculture and allied activities sector. All other things being equal, for female workers, the probability of being employed in agriculture sector is 12.43 percentage points higher than that of the male workers. The female workers are generally constrained in terms of employment mobility, and usually have lower levels of education, which prevents them from participating in more skill-intensive sectors. Additionally, there are a number of social and legal obstacles faced by Indian women. For instance, the inheritance laws favour males more than females. This restricts the access to land, credit and property for the Indian females. Moreover, the social status of a family is considered better if women do not work. The workers belonging to marginalized social groups (SC, ST and OBCs) are also more likely to be involved in agricultural and construction sectors. For a rural worker, the probability of being involved in agriculture is 52.55 percentage points higher than that of an urban worker. This is a substantial difference, and it emphasizes

the fact that for the rural workers, there are very few employment opportunities apart from the traditional agriculture related occupations.

6. Conclusion

This study tests the empirical relation between the education qualifications and employment status, for the Indian workers. It also attempts to measure the effect of a worker's education level in securing employment in a particular industry division. We use multiple probit regressions to test these relationships. The methodology controls for the personal characteristics like age and gender, as well as state level characteristics. This study finds that education level has a significant and positive relation with the employment status of a worker. More significantly, the probability of being engaged in regular (casual) employment improves (declines) with each additional educational qualification. Additionally, the less educated workers are more likely to be involved in low-paying and labour intensive industries, such as agriculture and mining. However, the workers belonging to the marginalized social groups (SC, ST and OBC), the female workers, and the rural workers, are at a considerable disadvantage in the labour market. The results have important policy implications. First, despite their education, these workers lack in vocational and professional skills due to substandard level of education. The policy focus should be on improving the job-market attributes of these workers, by improving the quality of education, particularly in rural and remote regions. Second, the results show that the rural workers are predominantly involved in traditional agricultural related occupations. Therefore, providing the access to regular employment opportunities in these regions is also essential. Third, various positive discrimination policies in favour of females would reduce the labour market inequalities between males and female workers. Few examples of such policies may include free schooling to the girl child, provisions for earning additional income by providing academic and administrative assistance in the institutes of higher learning, reservation for women in government jobs in proportion to their representation in the labour market, reforming the inheritance laws that currently are biased in favour of male heirs.

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7. References

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