Wage-differentials in India's Construction Industry

Kadambari Chheda & Anuradha Patnaik

Workers in India's construction industry are extremely diverse in nature, ranging from large number of unskilled workers to highly skilled engineers and technicians. The present study employs the panel regression technique to test the extended version of Mincerian wage equation for six different groups of construction workers. The results showed that work-experience is the most significant factor that influences the wages of India's construction workers whereas general education (years of schooling) is insignificant unlike other industries (where general education plays a crucial role in increasing the wage-rates). Also, depending on the nature of work, location, sector etc., technical education and formal vocation education play an important role in influencing the wages of the construction workers.

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Introduction

In developing economies, wages are influenced by strict labor market dualism and strong entry barriers amongst different segments of the labor markets (Heckman & Hotz, 1986). In India, dualism in the labor market has caused major variations in the wages and incomes of the workers (Sen, 1998). Several times it has been observed that workers performing similar type of work are paid differently in the country (Das, 2012). There are a few studies (Das, 2012; Krishna & Paul, 2012; Sengupta& Das, 2014) that have attempted to examine the causes of wage differentials amongst various group of workers at aggregate level. However, none of these studies inspected wage differentials distinctively for any specific industry. The present paper attempts to contribute to the existing literature, by examining wage differentials amongst the workers in construction industry in India.

Construction industry was particularly chosen for the present study because the workers who are engaged in this industry are extremely diverse in nature, ranging from large number of unskilled workers to highly skilled engineers and technicians. Wages form a major portion of income for a majority of the construction workers. According to 12th Five Year Plan Report on Construction Industry, amongst the entire construction workforce, 2.5% were skilled engineers, 2.75% were technicians and foremen, 2.26% were clerical staff, 9.1% were skilled workers and 83.3% were unskilled workers in 2012. This clearly indicates that labor-market of the construction industry is significantly segmented. Hence, there is a probability of existence of high wage differentials in this industry.

Labor-market of the construction industry is significantly segmented.

A flexible method to check wage differentials among different groups of workers is through the human capital theory (Becker, 1964; Mincer, 1958; 1974) according to which the rise in accumulation of human capital (i.e. education, skills and work-experience), leads to rise in the productivity and earnings of the workers. The present study employs the panel regression technique to test the extended version of Mincer (1974) wage equation, popularly known as "human capital earnings function", for the construction workers in India. The primary data source of the study is the National Sample Surveys (NSS) quinquennial unit-level data, which is one of the most exhaustive and extensive employment data for India. Most of the labor studies in India use this data as it consists of extensive data on different set of workers employed. It covers vast details of household characteristics, personal details, working details and wages of the workers in India. The present study uses the two rounds of NSS, i.e. 61st quinquennial (2004-05) and 68th quinquennial (2011-12).

We use panel-data set to empirically investigate the relationship between wages and 'human capital' variables (work-experience, education, technical education and vocation training), for six different groups of construction workers in India, separately. The six different groups are: (1) formal construction workers, (2) informal construction workers, (3) rural construction workers, (4) urban construction workers, (5) male construction workersand (6) female workers. The motive for separating workers into different groups, is to observe the fluctuations in each group individually, caused due to 'human capital' variables. This will contribute to understand precisely the influence of 'skill' variables (technical education and vocation training), in addition to 'education' and 'work-experience', on the wages of the construction workers in India.

Human Capital Theory

A persistent debate amongst various scholars, policy-makers and academia is "what determines wages" (Groshen, 1990). A relevant question in this debate inquires about why there is diversity in wage payments to various workers (Mortensen, 2003). According to Krishna and Paul(2012), wage disparities in the

Indian labor market can be attributed to mainly two reasons: first, they are employed in different economic activities; and the second, due to different skill-sets and education-levels (workers are heterogeneous in nature). Therefore, skills and education play a crucial role in the labor market not only for entering the labor market but also for explaining the variations in wages. Sengupta and Das (2014) showed that wage differences amongst workers could be explained by dividing the wage determining factors into two parts: (i) "observed" part (defined by variations in education, skill, work experience and social factors) and (ii) "unobserved" part (explained by the unknown factors). One of the significant methods to examine the "observed" part is the human capital theory. Human capital theory is an important theory of labour economics that studies impact of different "human-capital" variables (such as work-experience, education and training variables) on the wage-rates.

The foundation of human capital is from the time of classical economics (1776), which eventually developed into a scientific theory (Fitzsimons, 1999). Human capital generates positive spillovers in the economy (Acemoglu& Angrist, 2000). According to Romer (1990), it is 'a fundamental source of economic productivity'. Rosen (1999) denotes human capital as 'an investment that people make in themselves to increase their productivity'. Schultz (1961) was of view that accumulation of a person's human capital will largely affect his/her wage, firm's productivity and eventually national economy. Within the wide scope of demand and supply, several prominent economists like Schultz (1961), Becker (1962) and Mincer (1974) have stressed that market wage is a function of education, skills and experience acquired through years of schooling and training. They referred these variables as "human capital" variables which assist in explaining significant part of the variation in wages of the workers.

Accumulation of a person's human capital will largely affect his/her wage, firm's productivity and eventually national economy.

The early studies by Mincer (1958, 1974) and Becker (1964) were significant contributions to the human capital theory. The work by Mincer (1958) showed that training and skills positively influenced the incomes of workers. According to him, the variable 'training' could be divided into two sections: (a) formal training (years of schooling) and (b) informal training– work experience. In this model, he substituted worker's age for his/her work experience. According to Polacheck (2007), Mincer treated schooling and training as a part of investment on a worker; a worker likes to invest up to a limit where investment cost equals the present value of gains from it. The equation also directed that worker's wages increases consistently over a period at a decreasing rate yielding a concave earnings outline for most of the workers. The study by Lemieux (2003) has pointed out two reasons for Mincerian equation to be popular and a significant contribution to labor economics. They are: first it was an initial formal model which discussed investment in human capital; second, it provided the foundation for estimating causal effect of education on earnings, which was a crucial contribution.

Becker (1964) further worked on human capital model and showed the importance and effects of "on-the-job training." He described the distinction between: "firm specific" training and "general" training (Chiswick, 2003). "Firm specific" training refers to the skills developed by specific education, whereas "general" training refers to knowledge acquired through education and which can be useful in any work (*i.e.* reading, writing). According to Fugaret.al (2013), Becker's opinion on human capital was comparable to "physical means of production". That is, if one invests in human capital then their output would depend partially on the human capital's rate of return. This concludes that additional investment in the human capital would lead to addition to the total output. Several studies have used human capital model which have shown positive relationship between human capital variables and increase in wage-rates. Lynch (1992) showed that provision of training by private sector played a crucial role in positively influencing the wages of the workers. Newell and Socha (2007) displayed that there was an increase in wages of the professional and managerial workers in comparison to the less-educated workers. Mishel and Bernstein (2003) were of the view that increase in wage inequality amongst workers was majorly due to returns in the education and work-experience.

Additional investment in the human capital would lead to addition to the total output.

Michelacci and Pijoan-Mas (2007) pointed out that in addition to differences in education and job-experience, differences in the working hours of workers also caused wage differences amongst the workers. Das (2012) used Mincerian human capital model to check wage inequality in India. The results displayed that education had more effect on the expected wage in the Indian labor market. His study also showed the presence of diminishing returns to human capital in determining wages.

Human Capital in Construction

Construction industry is labor-intensive and its economic prosperity is closely linked to its human capital (Fugaret.al., 2013). It differs from other industries in regard to human capital theory as there is absence of strong relationship between education attainment and occupational choice amongst construction workers (Jollet.al., 1983). While employing the construction workers for work, the contractors and subcontractors usually asked for their job-experience in the sector rather than their educational qualification (Anwar, 2004). Therefore, work-experience or duration of time spent in the construction sector was the strongest variable influencing the construction jobs and their wages. Generally, in the construction sector providing training is less preferable as employers/contactors of other firms are willing to pay more for pre-trained construction workers and the workers readily leave their original jobs for better pay in other firms, according to Fugaret.al,(2013) who studied the importance of human capital in the Ghanaian construction industry. They indicated that the people working in the construction industry were of the belief that the activities involved in construction were majorly physical in nature and therefore could not be efficiently learnt in a classroom. This resulted into less attention being given to formal training or education by construction managers. The study also showed that, most of the construction firms were not inclined to invest in the training of construction workers as they were majorly temporary workers. They weren't willing to invest in expensive training as the benefits of such training would be in the long-term; and temporary workers change their workplace frequently.

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Technical and vocational education has traditionally been considered an option for those students who fail to make through the straight path (primary, secondary, preparatory to university) (Haimanot, 2014).'Technical education' and 'formal vocation education' forms the part of a 'specific industry training' variable, which is relevant for labor-intensive construction industry. Technical education refers to the courses provided after the secondary education and practical training to prepare technicians for work as supervisory staff. Vocational education refers to the training and skill building for workers with lower education levels in specific areas, and does not develop through general education (Goel, 2010). Majority of construction workers are illiterate or less literate, for them such 'firm specific' training gives opportunity for increasing their productivity levels for that particular industry.

Construction Industry in India

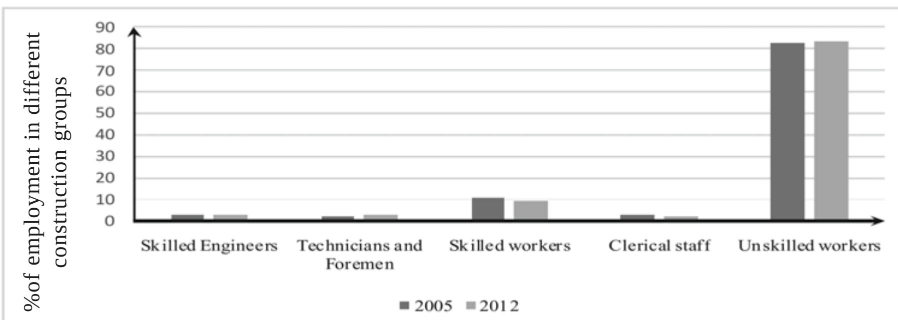
In 2012 construction industry contributed about 8 percent of gross domestic product in India. The gross value added by the industry increased from Rs.149950 crores in 2000 to Rs.228855 crores in 2005; and further to Rs.412412 crores in 2012. During 2000-2013, it attracted foreign direct investments of about Rs. 268796 crores. This was complemented by an increase in employment from approximately 17 million workers in 1999-00 to 26 million workers in 2004-05 and further to approximately 47million workers in 2011-12. Presently, it is the second largest employing sector in India, after agriculture.

According to 12th Five Year Plan Report on construction industry, amongst the entire construction workforce in 2012, 2.5% were skilled engineers, 2.75% were technicians and foreman, 2.26% were clerical staff, 9.1% were skilled workers and 83.3% were unskilled workers in 2012(fig. 1). Between 1995 and 2005, a considerable decline was experienced in the percentage of skilled engineers from 4.7 percent to 2.6 percent, to 2.5

percent in 2012. The percent of technicians increased from about 1.8 percent in 2005 to about 2.7 percent. In 2011, the clerical staff was about 2.6 percent in the total construction workforce. Between 2005 and 2012, construction industry experienced marginal increase in the unskilled workers from about 82 percent to about 83 percent; and corresponding decline in the skilled workers from about 10 percent to about 9 percent.

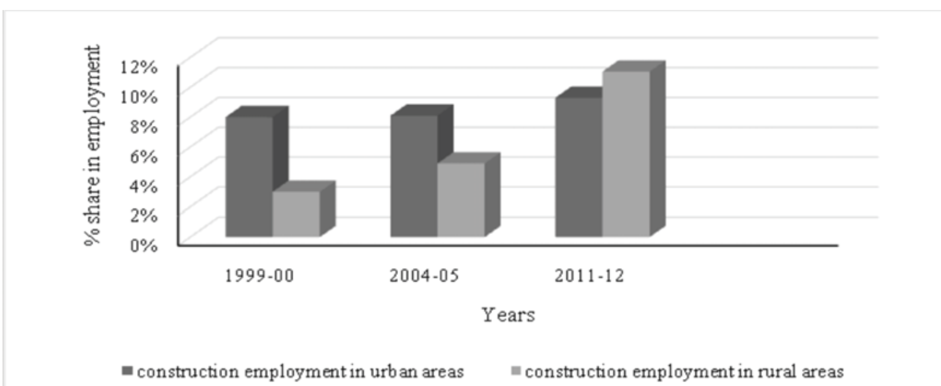
Fig. 2 illustrates the rural and urban divide of employment in the construction industry. The share of urban areas in the total construction employment has risen marginally from about 8 percent in 1999-00/2004-05 to 9.3 percent in 2011-12. Relatively, the share of rural areas in construction employment has been improving (from 3 to 4.9 percent during 1999-00 and 2004-05; and further to 11.05 percent in 2011-12). The construction workers are largely employed informally(without any formal job-contracts or social-security benefits). According to Mehrotra et.al (2012), in 2010, almost entire

Fig. 1 Construction Workers in Different Skills of Work (2005-2012).



Source: 12th FYP (2012-17), Government of India

Fig.2 Rural-Urban Composition of Construction Sector's Employment



Source: NSSO (EUS) Reports of 1999-00, 2004-05 and 2011-12.

workforce in the unorganized sector of construction industry was informally employed; and out of 13 million organized sector of construction industry, 11.3 million (about 87 per cent) were informally employed.

Data-Source

For the present study, the primary data source used is the unit-level data of National Sample Survey (NSS) quinquennial rounds, which is collected by the Ministry of Statistics and Program Implementation (MOSPI) - Government of India (GoI). It provides the most comprehensive and extensive employment-unemployment data of India at national, state and unit levels. NSS primary surveys employ a common theoretical method of estimating number of workers in all its surveys. Although NSS quinquennial round's unit-level data is available in 5 year intervals, it is considered the most superior employment data source because of the definitional lucidity and enhanced sampling methodology (Lall, 1976). Furthermore, it estimates large number of workers who contribute to the production of goods and services in India (Bhaumik, 2012).

For the present study, unit-level data of 61st quinquennial round (2004-05) and 68th quinquennial round (2011-12) have been used. 61st NSS quinquennial round was conducted from July 2004 to June 2005 and 68th NSS quinquennial round was conducted from July 2011 to June 2012. The unit-level data of NSS provides profound details of workers in India. This detail consists of personal and household characteristics of workers; along with work and wages related information. For the present analysis, workers between the ages of 15-59 were considered. The complexity of the data extraction is high due to large number of workers and their comprehensive details.

The NSS unit-level data is divided into eleven different levels for 61st NSS quinquennial round; and nine different levels for 68th NSS quinquennial round. Each level includes explicit category of details of every worker. The levels used for the present study were 2, 3, 4, 5 and 6 for both the NSS quinquennial rounds. Level 2 consists of the details of household characteristics of workers; level 3 consists of personal and demographic particulars of the workers; levels 4 and 5 consist of details about economic activities of the workers; and finally level 6 gives the details on wages of the workers. Initially, the entire data was extracted using the R software to the excel spreadsheets. For the different levels, the sample size of workers varied; therefore, we merged the required levels (mentioned above) with common household and personal identification number of each worker. This was followed by data extraction of the workers employed in construction industry, from the entire data-set by referring to their National Industrial Codes (NIC) *i.e.* NIC-2004 and NIC 2008.The details of the construction workers employed in the 61st quinquennial round data were extracted using NIC 2004; and for the 68th quinquennial round, NIC 2008 was used. The five-digit NIC 2004 codes for construction industry were: 45101, 45102, 45201, 45202, 45203, 45203, 45204, 45205, 45206, 45207, 45208, 45209, 45301, 45302, 45303, 45309, 45401, 45402, 45403, and 4550. The five-digit NIC 2008 codes for construction worker were: 41001, 41002, 41003, 42101, 42102, 42102, 42103, 42201, 42202, 42203, 42204, 42205, 42206, 42209, 42901, 42902, 42903, 42904, 42909, 43110, 43121, 43122 and 43123.

Methodology

Mincerian wage function or popularly known as "human capital earnings function", is the log earnings modeled as the sum of linear function of years of education and quadratic function of work experience (Lemieux, 2003). For the present study we extend this equation by adding the variables- technical education and formal vocational education - to the original equation. We use panel-data set to empirically investigate the relationship between wages and 'human capital' variables (work-experience, education, technical education and vocation training) distinctively, for six different groups of construction workers in India. The six groups are: (1) formal construction workers, (2) informal construction workers, (3) rural construction workers, (4) urban construction workers, (5)male construction workers, and (6) female workers. The rationale for separating workers into different groups is to observe the fluctuations in each group caused due to 'human capital' variables mentioned above. This will contribute in understanding precisely the influence of 'skill' variables (technical education and vocation training), in addition to the variables of 'education' and 'work-experience', on the wages of workers.

Panel regression technique studies the influence of different independent variables on a dependent variable across the year (spatial effects) as well as repeatedly over a period of time (temporal effects) (Frees, 2004). According to Paul (2011), panel data provides more informative data and higher efficiency because of greater degrees of freedom and less collinearity amongst variables. Therefore, to understand the impact of human capital variables on the wages of different clusters of construction workers across the space and time periods 2004-05 and 2011-12, we use the panel regression technique. The number of observations for 61st round and 68th round NSS round are unequal, however, to fit it in the panel-data, we take the weighted average of all the above mentioned variable figures. Therefore, before constructing the panel-data frame, we initially calculated the weighted average of each variable, for every state, individually; and then set it in the panel-data frame.

The basic 'Mincerian' wage function (1974) is expressed as:

$$\text{Log}w_i = \alpha + \beta_1 s_i + \beta_2 exp_i + \beta_3 exp_i^2 + \varepsilon_i \qquad (1)$$

Where,

w_i = wage rate,

s_i = number of years of schooling completed,

exp_i = years of labor market experience,

exp_i^2 =experience squared,

ε_i = random disturbance term capturing unobserved features,

β_1 = coefficient on years of schooling can be interpreted as the average rate of return (or the percentage change in wages) to an additional year of schooling. The above function (equation 1) assumes the rate of return is similar for all levels of schooling.

β_2 *and* β_3= The 'labor market experience' variable is incorporated in the equation because a worker with higher experience in a job is probable to receive more wages. The experience squared term captures the possibility of a non-linear relationship between earnings and work-experience.

Extending the Mincerian (1974) wage equation for the present study we added two more variables 'technical education' and 'formal vocation education' to the original equation (equation 1). This has been done keeping in mind, the nature of work in the construction industry which requires specialized skill sets, and availability of the data. Therefore, the extended Mincerian wage equation for the present study is expressed as:

$$Y_{it} = \alpha + \beta_1 X_{it} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X^2_{4t} + \omega_{it} \text{-------------------------} 2$$

Where, i=1,….,N;

t=1,….,T;

Y= wages of construction workers

X_1 = general education of construction workers

X_2 = technical education of construction workers

X_3 = formal vocational training of construction workers

X_4 and X^2_4 = age (proxy for work-experience) of the construction workers. The quadratic term in work-experience allows for the probable drop in post-schooling human capital acquisition.

β_1 = co-efficient for general education of construction workers.

β_2 = co-efficient for technical education of construction workers

β_3 = co-efficient for formal vocational training of construction workers

β_4 = co-efficient for age (proxy for job-experience) of the construction workers.

β_5= co-efficient for age squared (proxy for job-experience) of the construction workers. Note that, 'β_4' and 'β_5' co-efficient that corresponds to work-experience, reflects concavity in the age earnings when 'β5' is negative.

α = intercept of fix-effect model. Fixed effect model is used as it controls for the unobservable confounding variables that fluctuate across units, but are constant over time.

ω_{it}= is the normally distributed error term of the panel regression, with mean 0 and variance σ^2 measuring the effects of unobservable factors.

We regress six fixed effect panel regression models as per the above mentioned equation No.1: The six panel data models are as follows:

Model 1: Estimating the wage equation for formal construction workers.

Model 2:Estimating the wage equation for informal construction workers.

Model 3:Estimating the wage equation for construction workers employed in rural areas.

Table 1 Empirical Results of the Factors Influencing Wages of Different Groups of Construction Workers in India

Model Equations	Co-efficient	P-value
Model 1 (formal construction workers) *(formal)*	β_1: (+) 0.07	0.59
	β_2: (+) 0.89*	0.004
Y_{it} (formal) = $\alpha+\beta_1 X_{1t}$ (formal) + $\beta_2 X_{2t}$ (Formal) +	β_3: (+) 0.65	0.34
$\beta_3 X_{3t}$ (formal) + $\beta_4 X_{4t}$ (formal) + $\beta_5 X^2_{4t}$ (formal) +	β_4: (+) 0.01*	0.08
wit (formal)	β_5:(+) 0.008*	0.07
Model 2 (informal construction workers) *(informal)*	β_1: (-) 0.11	0.59
	β_2: (-) 1.52	0.39
Y_{it} (informal) = $\alpha+\beta_1 X_{1t}$ (informal) + $\beta_2 X_{2t}$ (informal) +	β_3: (-) 0.70	0.72
$\beta_3 X_{3t}$ (informal) + $\beta_4 X_{4t}$ (informal) + $\beta_5 X^2_{4t}$ (informal) +	β_4: (+) 0.45***	4.85e-05
wit (informal)	β_5: (-) 0.006***	0.0003
Model 3 (rural construction workers) *(rural)*	β_1: (-) 0.13	0.05
	β_2: (-)1.07	0.36
Y_{it} (rural) = $\alpha+\beta_1 X_{1t}$ (rural) + $\beta_2 X_{2t}$ (rural) +	β_3: (+) 1.79*	0.01
$\beta_3 X_{3t}$ (rural) + $\beta_4 X_{4t}$ (rural) + $\beta_5 X^2_{4t}$ (rural) +	β_4: (+)0.29**	0.009
wit (rural)	β_5: (-) 0.003*	0.05
Model 4 (urban construction workers) *(urban)*	β_1: (+) 0.08	0.18
	β_2: (+) 0.06*	0.03
Y_{it} (urban) = $\alpha+\beta_1 X_{1t}$ (urban) + $\beta_2 X_{2t}$ (urban) +	β_3: (+) 0.79	0.36
$\beta_3 X_{3t}$ (urban) + $\beta_4 X_{4t}$ (urban) + $\beta_5 X^2_{4t}$ (urban) +	β_4: (+) 0.22*	0.02
wit (urban)	β_5: (-) 0.002*	0.18
Model 5 (male construction workers) *(male)*	β_1: (-) 0.29	0.72
	β_2: (+) 0.08*	0.039
Y_{it} (male) = $\alpha+\beta_1 X_{1t}$ (male) + $\beta_2 X_{2t}$ (male) +	β_3: (+) 0.074	0.89
$\beta_3 X_{3t}$ (male) + $\beta_4 X_{4t}$ (male) + $\beta_5 X^2_{4t}$ (male) +	β_4: (+) 0.29**	0.009
wit (male)	β_5: (-) 0.00036*	0.058
Model 6 (female construction workers) *(female)*	β_1: (+) 0.04	0.76
	β_2: (+) 1.13	0.45
Y_{it} (female) = $\alpha+\beta_1 X_{1t}$ (female) + $\beta_2 X_{2t}$ (female) +	β_3: (+) 0.85	0.72
$\beta_3 X_{3t}$ (female) + $\beta_4 X_{4t}$ (female) + $\beta_5 X^2_{4t}$ (female) +	β_4: (+) 0.25***	0.0003
wit (female)	β_5: (-) 0.003***	0.005

Note: (+) denotes positive co-relation, (-) denotes negative co-relations. '***' denotes 1% level of significance. '**' denotes 5% level of significance '*' denotes 10% level of significance. 'Y'= wages, X_1= general education, X_2= technical education, X_3 = formal vocation education, X_4 = work-experience (proxied by age).

Model 4: Estimating the wage equation for construction workers employed in urban areas.

Model 5: Estimating the wage equation for male construction workers .

Model 6: Estimating the wage equation for female construction workers.

Table 2 Implications of Models 1-6

Model	SignificantCo-efficient(s)	Implications
Model 1		
Formal construction workers	Technical Education Work- experience	Technical education co-efficient is positive and significant for formal construction workers. The coefficient of 'work-experience' and 'squared work experience' are both positive for formal construction workers unlike in the other models (where 'squared work experience' is negative). It indicates that wages of formal construction workers in India rises with the accumulation of work-experience, at an increasing rate.
Model 2		
Informal construction workers	Work- experience	Only work-experience is significant for the informal construction workers.The model shows significant and positive co-efficient for 'work-experience' and significant negative co-efficient for 'squared work-experience'. It indicates that wages of the construction workers in India rises with the accumulation of work-experience, at a decreasing rate. These results are consistent with the Mincer's theory.
Model 3		
Rural construction workers	Formal Vocation Education Work- experience	Vocation training co-efficient is positive and significant. Also, work-experience is significant for the rural construction workers.
Model 4		
Urban construction workers	Technical education Work- experience	Technical education and work-experience is significant for the urban construction workers.
Model 5		
Male construction workers	Technical education Work- experience	Technical education is positive and significant for male construction workers. Also, work-experience is significant for the male construction workers.
Model 6		
Female construction workers	Work- experience	Only work-experience is significant for the female construction workers.

Empirical Results

Our results are presented in table 1. Detailed implications of our results are given in table 2.

The results of Table 2 can be summed up as follows:

'Work-experience' is the most significant factor influencing the wages of construction workers in India

- 'Work-experience' is the most significant factor influencing the wages of construction workers in India (significant for all the above models). It is the pre-dominant and pre-requisite factor influencing the wages of the construction workers in India. The results show significant positive co-efficient for 'work-experience' and significant negative co-efficient for 'squared work-experience' (except model 1). It indicates that wages of the construction workers in India rises with the accumulation of work experience, at a decreasing rate. Construction is one of the few industries where people can work their way to the top from the bottom level with increase in work-experience (Fisher, 2007).
- The variable 'general education' is insignificant for all the six tested models. This implies that the years of schooling (general education) does not have any significant impact on the wages of construction workers in India, unlike other industries in the economy (where increase in general education leads to increase in the worker's wages). This empirical result supports the theoretical argument of Anwar (2004) that while recruiting construction workers, the employers (contractors and subcontractors) usually ask workers for their past work-experience rather than educational qualifications.
- 'Technical education' variable is positive and significant for the wages of formal construction workers. Needless to mention that, high skill-based construction work (usually performed in the formal construction sector) requires workers with good technical education background. Furthermore, wages of the informal construction workers are distinctly based on 'work-experience' (p-value 0.0003) only. Informal construction workers are mainly illiterate or they are less educated migrant workers who find work in construction industry as a last resort (with no skill-based education).

For the wages of rural construction workers, formal vocation education plays a significant role in addition to work-experience; whereas for wages of the urban construction workers, work-experience and technical education are significant.

- For the wages of rural construction workers, formal vocation education plays a significant role in addition to work-experience; whereas for wages of the urban construction workers, work-experience and technical education are significant. One of the reasons for such results might be that, in rural areas, construction industry is considered a potential sector as a source of income, unlike in urban areas where most of the workers are highly literate and consider this industry only for the illiterate and migrant workers (ILO, 2000). Workers in rural areas consciously take up vocation education as a substitute for technical education (as vocation education does not require secondary-level schooling). It helps them to improve their existing earnings in the industry. In urban areas, workers enter in the construction industry only with the two extreme views: (1) of either earning high returns (with sound technical education background) or (2) as industry of 'last resort' to get work (for illiterate and unskilled workers).

- Gender wage-discrimination exists at a large scale in the construction industry of India (Jhabvala&Kanbur, 2002; Devi & Kiran, 2013). Women in India are usually involved only in the unskilled construction work (Barnabas et.al, 2009). Therefore, the skill-based variables (technical education) is only significant for wages of the male construction workers and not for the female construction workers, who are often involved in the unskilled type of construction work. Majority of workers in the construction sector have a view that women lack skills to perform certain tasks in the construction sector. Such mindset has led to discrimination of women in this sector and is preventing them from being trained and employed as masons in construction sector (Lingam, 1998)

Conclusions

'Work-experience' is the most significant factor that influences the wages of the construction workers in India.

It can be concluded that, 'work-experience' is the most significant factor that influences the wages of the construction workers in India. Extending the Mincerian wage equation (1974) (by adding technical education and formal vocation education to the original equation) has been justified by the above panel regression results. Depending on the nature of work, location and gender, other variables like 'technical education' and 'formal vocation education' also play an important role in influencing the wages of the construction workers in India. The variable 'general education' is insignificant for all the six tested models, which implies that the years of schooling (general education) does not have any significant impact on the wages of construction workers in India, unlike in the other industries in the economy (where increase in general education leads to increase in the worker's wages). Additionally, results also suggest that, technical education is significant for the formal construction workers; and the skill-based variables are significant only for the wages of male construction workers and not for their female counterparts.

Policy-Implications

For formalizing the construction work-force and improving their wage-rates, more attention has to be given to the accessibility of technical education and formal skill-based (vocation) training for the construction workers in India. Secondly, considering the importance of 'work experience' for construction workers in improving their wages, 'experience certificates' (as issued in the formal sector) would prove beneficial for them in further improving their earnings.

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