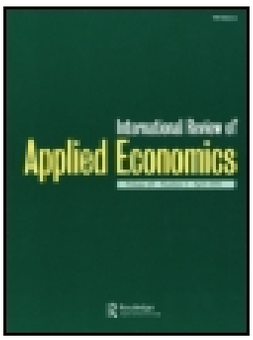

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Heterogeneity and participation in informal employment among non-cultivator workers in India

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ABSTRACT

Labour informality is one of the most serious challenges facing a developing economy like India with large-scale poverty and decent work deficits. This study has inspected possible heterogeneity within informal employment among the non-cultivator workers. Multinomial Logit was applied to find out the determinants of participation in different components of informal employment. Significant heterogeneity within the informal employment on poverty, age, gender, socio-religious communities, educational attainment and industrial classification was observed. There is coexistence of voluntary and involuntary informal employment. Given the diversity of employment, one-size-fits-all policy design may adversely affect sustainable and inclusive growth in India.

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1. Introduction

India has achieved remarkable growth in Gross Domestic Product after 2004. It has also witnessed rising inequality without interpersonal or inter-caste/class inclusiveness in growth (Subramanian and Jayaraj 2015). However, growth with equality is possible under the condition of decent work (Heymann and Earle 2010). In the domain of decent work – formal and informal – employment is the most critical ingredient. Better and quality employment opportunities for the current generation will provide level playing field for the future generations and can contribute to reduce rising inequality. But the traditional full-time jobs being replaced by non-standard employment pose serious challenges (Atkinson 2015).

Labour informality has become a relevant issue in the current development debate. Its importance is even more in a developing country like India with large-scale poverty line and inadequate public provisions for unemployment insurance. This makes unemployment an unviable alternative and individuals are forced to take up whatever opportunities that come their way. Hence, overall unemployment rate provides no informative picture of the labour market in the country, as a large section of such employment is likely to be of a bare subsistence nature. Unemployment is an unreliable yardstick to measure distress in the labour market (Fields 2011) because it is higher in developed countries than developing

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countries (ILO 2015). Hence, it is central to look at the quality of work of the employed which brings labour informality to the forefront.

Labour informality has a history going back to the 1970s. Keith Hart, a British ethnographer, is credited with coining the term 'Informal Sector'. About the same time, ILO launched several studies on this in Africa (Jütting, Parlevliet, and Xenogiani 2008). The early conceptualisation had highlighted the informal economy as a residual sector distinct from the formal economy (Lewis 1954; Harris and Todaro 1970). In the late 1980s, the structuralist school highlighted the close relation between the formal and the informal economy. Still others have underlined on the role of institutional bottlenecks in creating the incentives to work informally (Chen 2012). Informal economy and informal employment are different, though closely related. We have used the term informality to denote informal employment, and for sectors, we have used organised and unorganised.

Examining informal employment in India, researchers have dichotomised labour market into informal and formal divide. Implicitly they have assumed homogeneity within informal employment (Sastry 2004; Sengupta et al. 2007; Mehrotra et al. 2012, 2013). However, existing literature suggested two contested issues i.e. whether informal employment is voluntary or involuntary (Kucera and Roncolato 2008; Fields 2011) signalling possible heterogeneity within informal employment. Although there are diversified opinions on the drivers of informality, they can put into two broad groups – informality by choice and informality as exclusion (Perry et al. 2007). The former premise emphasises the voluntary nature of informality as workers engage in informal work to escape burdensome government taxes and regulations (Maloney 1999, 2004; Maloney and Bosch 2007). However, it may not be true for India (Fields 2005). The later premise stress without decent jobs and unemployment protection, workers are forced to take up jobs as informal employees (Chen et al. 2005). Some authors take a more nuanced view contending that both the forms of informality may persist in an economy in varying degrees depending on the level of the country's economic development (Fields 1990, 2005; De Mel, McKenzie, and Woodruff 2008; Perry et al. 2007; Gindling and Newhouse 2014; Kucera and Roncolato 2008), and especially for women (Maloney 2004).

While some contend the self-employed category to be the voluntary segment with informal wage workers mainly being considered necessity driven (Maloney 2004), others deliberate the possibility of even informal wage employment as in part voluntary (Watson 2013; Nunez and Livanos 2015). So, looking at informal employment from an aggregate point of view without considering its subcategories is not likely to give much information on the diversity within the informal employment. Therefore, we intend to study the trends and determinants of the various subcategories of informality with reference to the formally employed. This will shed more light on diversity within the informal employment. Most of the literature on this issue, to the best of our knowledge, deals with Latin America, Europe, and sub-Saharan countries. There is hardly any literature available on South Asian developing countries, and on India. The present study examines the heterogeneity within informality for the non-cultivator workforce in India linking it with different individual, household, regional, and industrial characteristics.[1] In addition, the study has examined the micro-determinants of participation in informal employment compared to formal employment. The study found high degree of heterogeneity within the informal employment.

The paper is divided into four sections. Section 2 has presented the data sources and the analytical framework. Section 3 has reported the results of the study including the descriptive statistics and multinomial logistic analysis. Section 4 has provided the conclusions and dwells on some policy suggestions.

2. Analytical framework and data sources

2.1. Identifying informal employment

The study has used unit-level data from the National Sample Survey Organisation (NSSO) Employment-Unemployment Survey (EUS) for four time periods 1999–2000, 2004–2005, 2009–2010 and 2011–2012. The sample size is representative at both national and sub-national (state) level.[2] The EUS for the four rounds contains information on the enterprise size and type, employment status and social security benefits to workers.[3] We have utilised these information to distinguish between organised and unorganised sector and employment.[4] The study has distinguished organised and unorganised sectors based on the number of workers in the enterprise, and type of enterprise; and to distinguish the formally and the informally employed, we consider social security benefits, work status, and organised and unorganised sectors distinction. We have used the NCEUS methodology modifying it suitably to classify workers into the formal and informal employment. Details are provided in Appendix 1.

Further, it provides individual and household-level information we have used for further analysis. We carry out our analysis excluding the cultivators as information on the availability of social security benefits and enterprise type or number of workers in the enterprise is not available for such workers. Internal heterogeneity within the informal employment is examined by dividing the informal employment into five distinct categories by 'usual status' of the workers, i.e. on the job-based criterion.[5] The categories are – informal own-account workers, informal employers, informal unpaid family workers, informal regular workers and informal casual workers.[6] The formal economy is taken as a single category.[7] Hence, we have six distinct categories including the formally employed. To study the trends of the different informal employment groups we evaluate simple descriptive statistics. We conduct multinomial logistic analysis to investigate the determinants of the components of informal employment.

2.2. Determinants of participation in informal employment

There are six mutually exclusive alternatives for an individual to get employment (formal labour, informal self-employed, informal employer, informal unpaid family worker, and informal casual and regular informal workers). Our model of employment choice is based on the rational agent theory which states that the rational individual would choose the employment which provides him the maximum discounted lifetime utilities from all the available choices (Boskin 1974; Johansson 2000). That is, the individual i chooses the employment j if, $U_{ij} > U_{it}$, where $t = 1, 2, 3, \ldots J$ indexes the fixed set of employment choices available to an individual with $t \neq j$ and U_{ij} represents the utility of the individual i from employment choice j. The utility attained from an employment choice depends on the expected lifetime earnings, autonomy and flexibility, risks, effort to be expended and the net prerequisites

anticipated in the employment choice (Rees and Shah 1986; Uusitalo 2001; Douglas and Shepherd 2002). It is, symbolically

$$U_{ij} = f\left(I_{ij}, A_{ij}, F_{ij}, R_{ij}, E_{ij}, P_{ij}\right) \tag{1}$$

where, I_{ij} is the expected lifetime income of individual 'i' from the 'j'th employment choice; similarly

A_{ij} is the autonomy or independence; F_{ij} is the flexibility; R_{ij} is the risks involved; E_{ij} is the effort required to be expended; and, P_{ij} is the net pre-requisites anticipated from the 'j'th employment by *i*th individual.

However, information on the above job characteristics are not available in our case and hence following Rees and Shah (1986), we make use of individual-level (characteristics) proxy variables to substitute for the above job characteristics. In effect our utility function takes the following specification,

$$U_{ij} = \alpha + \beta' X_{ij} + \varepsilon_{ij} \tag{2}$$

Hence, the utility associated with the employment choice *j* is the sum of a deterministic element $\beta' X_{ij}$ and a random component ε_{ij}, where X_{ij} captures the characteristics of the individuals.

Since our outcome variable, i.e. participation in employment is nominal natured, limited depended variable models are applied to model the employment choice (Schmidt and Strauss 1975; Mohapatra and Sahoo 2016). Therefore, multinomial categorical variable model was applied to examine the characteristics that determine participation. Following Cameron and Trivedi (2005), Maddala (1983), and Wooldridge (2010) the dependent variable is defined to take the value *j* if the *j*th alternative is taken, *j* = 1, 2, 3, 4, 5, and 6. We have defined alternative *j* is chosen as,

$$p_j = \Pr\left[y = j\right], j = 1, 2 \ldots 6$$

We have introduced six binary variables for each observation *y*,

$$y_j = \begin{cases} 1 \text{ if } y = j \\ 0 \text{ if } y \neq j \end{cases} \tag{3}$$

Thus y_j equals one if an alternative *j* is the observed outcome and the remaining y_k equal zero ($j \neq k$), so for each observation on *y* exactly one of $y_1, y_2, \ldots y_6$ will be non-zero.

For our regression model, we introduce a subscript 'i' for the *i*th individual and regressors x_i, where x_i is a 1 * *k* vector of explanatory variables. The probability that the individual *i* choose the *j*th alternative is given by,

$$p_{ij} = \Pr\left[y = j\right] = \frac{\exp\left(x_i' \beta_j\right)}{\sum_{l=1}^{6} \exp\left(x_i' \beta_j\right)}, j = 1, 2, \ldots, 6 \tag{4}$$

where β_j is a $k * 1$ vector of regression coefficients.

Because, $\sum_{j=1}^{6} p_{ij} = 1$, we impose the restriction that $\beta_1 = 0$. Applying the Maximum Likelihood method to obtain the regression coefficients, we have the following equation,

$$\frac{Pr[y_i = j]}{Pr[y_i = 1]} = \exp\left(x_i'\beta_j\right) \tag{5}$$

Hence, $\exp(\beta_{jr})$ gives us the change in the probability of choosing the category j compared to the alternative one when x_{ir} changes by one unit. This is the relative risk ratio or the odds ratio as in the binomial logit model. The coefficient interpretation is then identical to the binomial logit model.

However, the above model is likely to be suffering from the endogeneity problem due to the presence of reverse causality between the independent variable Monthly Per Capita Consumption Expenditure (MPCE) and employment choice. We attempt to solve the problem using the Control function approach (Terza, Basu, and Rathouz 2008; Wooldridge 2015).

Following Wooldridge (2015) and Terza, Basu, and Rathouz (2008), suppose the employment choice model is given as,

$$y_j = f\left(x_1'\beta_{1j} + x_2'\beta_{2j}\right) + u_j \tag{6}$$

where y_j is a variable depicting employment choice as in (3), $f(.)$ is the logistic function, u the error term, x_1' and x_2' are the exogenous and endogenous variables in our model, respectively, and β_{1j}, β_{2j} the respective coefficients. Given the endogenous variable in our model, $E(u|x_2') \neq 0$ and consistent estimates of the β's is not possible. Suppose we have an instrument z_2 for x_2 such that z_2 is strongly related to x_2 and unrelated with the error term u_j. Given such an instrument, we run a regression where we regress x_2 on x_1 and z_2 as follows,

$$x_2 = \alpha_1 x_1 + \alpha_2 z_2 + v \tag{7}$$

We obtain the predicted residuals from the model $\hat{v}$, which we include in the original employment choice model (6) along with the endogenous variable x_2, as follows,

$$y_j = f\left(x_1'\beta_{1j} + x_2'\beta_{2j} + v\beta_{3j}\right) + u_j \tag{8}$$

The above model provides us with consistent estimates of the β's. Further, $H_0{:}\beta_3 = 0$ provides a heteroscedastic-robust test of the exogeneity of x_2.

In our model, we use the age of the household head and the average years of education of all the working members of the household as well as their squared terms as instruments for our potential endogenous variable MPCE. Our argument is that both the age of the household as well as the education of the working members of the household are necessarily predetermined variables and hence are unlikely to be influenced by the choice of the employment of the individual.

The literature suggests several determinants of informality. Among them are age, years of education, technical education, household income, religion, social group, gender, marital status, sector and industry and state region (Henley, Arabsheibani, and Carneiro 2009; Angel-Urdinola and Tanabe 2012; Yu 2012; Lehmann and Zaiceva 2013). We have considered these variables to determine the determinants of on informality.

Workers' age reflects an amalgam of the on-the-job-skills, experience, social contacts, capacity for strenuous work as well as risk preference. Hence, the relation of informality with age might reveal the potential lifecycle dynamics of the workers as they move across jobs. Thus, while workers at a younger age may be associated with informal work or self-employment due to their risk-taking nature, ability to put in long work hours, older workers may prefer self-employment or formal work due to the presence of social, human and financial capital as well as the flexibility of self-employment jobs (Le 1999; Georgellis, Sessions, and Tsitsianis 2005; Simoes, Crespo, and Moreira 2015). Existing empirical literature shows the probability of informal wage employment to fall with rising age levels, whereas we find a positive relation between age and probability of formal wage employment (Polavieja 2006; Karabchuk 2012; Barański 2014; Lehmann 2015). With regard to the self-employed, existing literature points towards a positive and non-linear relation of age and self-employment (Simoes, Crespo, and Moreira 2015; Blanchflower, Oswald, and Stutzer 2001). However, other studies report a negative relation of age and self-employment (Bridges and Lawson 2009). Further, Lehmann (2015) distinguishing between informal and formal self-employment finds a positive relation of age and self-employment in the case of the former and an insignificant relation in the case of the later. Both age and its square were included as we have hypothesised a quadratic relation of age with informality. However, taking both age and its square creates the problem of multicollinearity. Hence, we deduct mean of age from age and take the demean age and its square which resolved the problem of multicollinearity.

Formal education and vocational education provides a critical signal to potential employers about workers' skill. Higher educated are supposed to be the first to be absorbed in the formal wage employment category, and lowest skilled workers, signalled by the level of education, will likely be engaged in informal unpaid family works or informal casual works. In contrast, the more educated are also likely to prefer self-employment due to their better managerial abilities and their ability to better identify self-employment opportunities (Le 1999; Georgellis, Sessions, and Tsitsianis 2005; Simoes, Crespo, and Moreira 2015). Estimates from existing empirical studies generally show a negative relation of educational attainment with the probability of informal wage employment whereas for the formal employed a positive relation is found (Dimova, Nordman, and Roubaud 2010; Karabchuk 2012; Barański 2014; Lehmann 2015). Regarding the self-employed, the literature till date finds contradictory results on the relation of education and self-employment (Simoes, Crespo, and Moreira 2015), with some studies finding a positive effect of education and self-employment (Lehmann 2015), while others reporting a negative relation of education and self-employment (Blanchflower, Oswald, and Stutzer 2001; Bridges and Lawson 2009; Dimova, Nordman, and Roubaud 2010). In order to bring out the effect of education we have taken the information on the education status of workers. Rather than taking dummies for different educational levels, a continuous variable depicting years of education of the workers[8] was included in the model. However, to capture the effect of technical education on informality, a dummy variable was introduced, which takes the value of one if an individual has technical education otherwise zero.

Many authors have considered informality and poverty as synonymous (Kar and Marjit 2009; Kathuria and Raj 2016). Though not entirely true, there is a significant overlap between them. Further, some argue that developing countries faces serious challenge of employment than unemployment, signifying the seriousness of poverty in employment in developing nations (Fields 2011; ILO 2015). However, others have contended that incomes are significantly higher for specific informal employment segments such as the self-employed (Maloney

2004). Higher incomes may also enable individuals to finance their self-employment activities and provide collateral for the same (Le 1999; Georgellis, Sessions, and Tsitsianis 2005; Simoes, Crespo, and Moreira 2015). Hence, looking at the poverty rates and mean household expenditures for workers across informal categories may give us some insight into the problem. Existing literature generally reports a positive relation of incomes with the probability of self-employment (Simoes, Crespo, and Moreira 2015). MPCE of the household was taken as a proxy for family income and to capture poverty. We have taken the natural logarithm of MPCE. We have also examined at the incidence of informality across various poverty groups.[9]

Perhaps in India poverty falls more on some marginalised groups such as Schedule Tribes (ST), SC and Muslims, though over the years, the incidence of poverty on them is declining (Panagariya and More 2014). Further, in India, social and religious stratification plays a decisive role in occupational distribution and labour market outcomes (Das 2006; Deshpande and Sharma 2016). Available studies also point towards the high propensity of SC/ST groups with regard to employment in informal wage employment or informal self-employment activities (Das 2006; Thorat and Sadana 2009; Iyer, Khanna, and Varshney 2013). Therefore, it is imperative to examine informality with reference to social and religious communities. The incidence of informality across caste and religion community throws light on whether it is restricted to some groups or not. However, examining it in absolute terms without considering their population share may reveal distorting results.[10] Two social stratification variables included in our model are: religion and caste. We have considered three broad religions communities – Hindu, Islam and 'Others' which includes all other religions. We have included separate dummies for all the religions except Hindus, which acts as the reference category. Similarly, separate dummies for the social groups were excluded taking 'Others' (usually known as general caste)' as the reference caste.

The composition of informality by gender and space dimension may also provide insight to rural–urban concentration of informality and gender discrimination. While the literature refers to the risk-averse nature of women as a reason for their likely lower self-employment rates, the higher flexibility offered by such employment may also provide an incentive for self-employed activities such as unpaid family labour (Simoes, Crespo, and Moreira 2015). Further, the existence of a relatively better physical, financial and social infrastructure and better economic opportunities in urban areas may provide better opportunities for starting a business self-employed or getting employment as a formal wage employee. Existing literature in regard to the impact of gender shows informal wage employment is inconclusive with the probability of informal wage employment higher for males in some studies (Lehmann 2015) and for females in others (Polavieja 2006; Dimova, Nordman, and Roubaud 2010). With respect to self-employment, on the other hand, majority of studies provide evidence of the propensity of self-employment being significantly higher for men (Blanchflower, Oswald, and Stutzer 2001; Dimova, Nordman, and Roubaud 2010; Lehmann 2015; Simoes, Crespo, and Moreira 2015). In contrast, Bridges and Lawson (2009) find the odds of self-employment are higher for women. Further, estimates for the impact of rural–urban location show the propensity of informal wage employment to be higher in cities in some studies (Karabchuk 2012) and lower for others (Lehmann 2015). Lehmann (2015), on the other hand, finds the propensity of informal self-employment to be higher in urban areas with no clear pattern for the formal self-employed. Separate dummies for gender (male/female) and location (rural/urban) are included in the model, taking females and urban as the reference categories respectively.

Being married as well as the presence of elderly and children in the household can lead to increased levels of risk aversion among individuals leading to a move away from self-employment. On the other hand, family responsibilities after marriage may also motivate an individual look for better income-earning opportunities (Simoes, Crespo, and Moreira 2015). Results from existing studies show the propensity of informal wage employment to be lower among the married relative to the formally wage employed (Lehmann 2015). Being married generally leads to a positive impact on the propensity of self-employment (Lehmann 2015; Simoes, Crespo, and Moreira 2015). To capture the effect of marital status, we have divided the workforce into two groups – never married and married where all married, divorced and widowed workers are clubbed together into a single category. We interpret our results against the base group of never married workers. Similarly, the impact of young children and elderly in the household on the occupational choice of members is captured through the dependency ratio. In order to generate the variable, we sum up the number of young children below age five and the number of non-working elderly aged 60 and above. We divide this number by the household size to arrive at the dependency ratio of the household.

In the development process both regarding value added and employment, the transition from agriculture to industry, and then to services is desirable, since later two sectors are perceived to be more productive. Wages in those sectors are higher and hence preferred sectors of employment. Earlier studies show that relative to the formal wage employed, probability of informal wage employment is higher in Agriculture & Fishing, Construction, Hotels & Restaurants, Public Services and Other Services (Polavieja 2006). We have included dummies for the industrial affiliation of the workers, which will capture job characteristics. The industrial association of the workers can be obtained from the National Industrial Classification code of the respective workers available in the EUS data. We have grouped workers into seven broad industries viz. 'Agriculture' (excluding cultivators); 'Mining, Electricity & Water Supply'; 'manufacturing'; 'Construction'; 'Trade, Hotels & Transportation'; and 'Finance, Insurance & Real Estate'. We create separate dummies for all the above industries except for 'Trade, Hotels & Transportation' which is the reference category.

Similarly, the propensity of different occupational groups towards the different employment groups may also differ. Generally, we would expect skilled occupational groups such as managers and professionals to be employed as formal workers and employers. Similarly, low-skilled occupations such as clerks, sales workers and peasants are more likely to be employed as informal own-account, regular and casual workers. This is also what we find in the literature (Le 1999; Polavieja 2006; Lehmann and Zaiceva 2013). We have divided the workers into four broad occupational groups based on their skill levels. Hence, correspondingly, we have three separate dummies for 'Highest skill workers', 'High skill workers' and 'Lowest skill workers' keeping 'Low skill workers' as the reference category.[11,12] Finally, state dummies have been included in the model to control for the effect of state-level characteristics and policies.[13] Uttar Pradesh is taken as the reference state.

3. Results and discussion

3.1. Trends and patterns of components of informality

One of the objectives of this study is to examine the incidence of informal employment heterogeneity, and its trends and patterns in India. Before going to the details, we have examined informality at the aggregate level in India. The incidence of informal employment

is high in India (Sengupta et al. 2007; Kannan 2009; Mehrotra et al. 2013). The percentage of informality in employment in total workforce (including cultivators) was about 93.8% in 2004–2005 but has declined placidly to 92.5% by 2011–2012. However, in absolute terms, there is a rise. Besides this, informal employment in the organised sector has been increasing implying informalisation of the organised sector (Mehrotra et al. 2013).

Labour informality among non-cultivator workers in India rose from around 84% in 1999–2000 to around 86% in 2004–2005 and has hovered around that range (Table 1). We observe a significant rise in unorganised sector employment from around 67% to about 75% from 1999–2000 to 2004–2005 before declining to around 68% in 2011–2012. There has been a drastic rise in informal employment within the organised sector. It suggests a trend of casualisation of jobs within the organised sector because many public and private sector firms are employing under non-standard employment contracts without social security benefits. This has adverse consequence on workers, as informal workers in the organised sector are the first one to be retrenched if any economic shock occurs.

Considering the proportion employed in the employment categories, we have found formal workers' share has declined marginally and has hovered around 14% in the last several years, when India has witnessed the highest economic growth, particularly in the non-agriculture sector. This is quite at variance with the Lewisian process, where, as an economic progresses workers move from informal employment to formal employment. Own-account workers constitute the biggest component of the labour force at around 35%, followed by informal casual workers. The concentration of unpaid workers and informal regular workers are between 10 and 18%. Informal employers constitute the smallest segment of the workforce (1%) (Figure 1).

A significant reduction in the proportion of the workforce among the unpaid family workers has been observed with a drastic increase in the proportion employed among casual and regular workers. Further, the fall in the informal self-employed was majorly absorbed in informal casual workers, which is mainly in the construction sector. This suggests that many informal self-employed were moving to construction sector as daily wage earners. It indicates that in India the informal self-employed are rationed out of the wage job market. Similar picture was reported in Sri Lanka by De Mel, McKenzie, and Woodruff (2008) and for Latin America by Tokman (2007) The self-employed are waiting for a right salaried job to shut down their business (Banerjee and Duflo 2007). The share of informal employers has remained almost stagnant.

Examining the incidence of informality across various age groups, we have observed that the concentration of unpaid family workers is high among children aged 15 or below compared to the other age groups. There is a decent concentration of child workers among informal regular and casual workers. However, the prevalence of child labour, particularly unpaid family workers has declined significantly in 2011–2012. This is probably due to the implementation of Righty to Education Act which calls for free and compulsory education for children below 14 years of age. Further, government provision of Mid-Day-Meals, free books, and free dress for children increases the reservation wages of children dropping from the labour force. In informal family workers, for age groups, 25 and above, we have recorded a rise in their share. This may be due to increase in unpaid family workers of women, as after marriage or school, given the social–economic–political constraints faced by females they prefer to work from home. This is substantiated by the large share of female workers within this group (Figure 2).

Table 1. Labour informality among non-cultivator workers in India.

	1999–2000			2004–2005			2009–2010			2011–2012		
	Organised	Unorganised	Total	Organised	Unorganised	Total	Organised	Unorganised	Total	Organised	Unorganised	Total
Formal	45.34	1.2	15.8	49.93	1.01	13.15	44.00	1.23	14.16	40.93	0.98	13.6
Informal	54.66	98.8	84.2	50.07	98.99	86.85	56.00	98.77	85.84	59.07	99.02	86.4
Total	33.07	66.93	100	24.82	75.18	100	30.25	69.75	100	31.58	68.42	100

Source: Authors' calculation based on NSSO data.

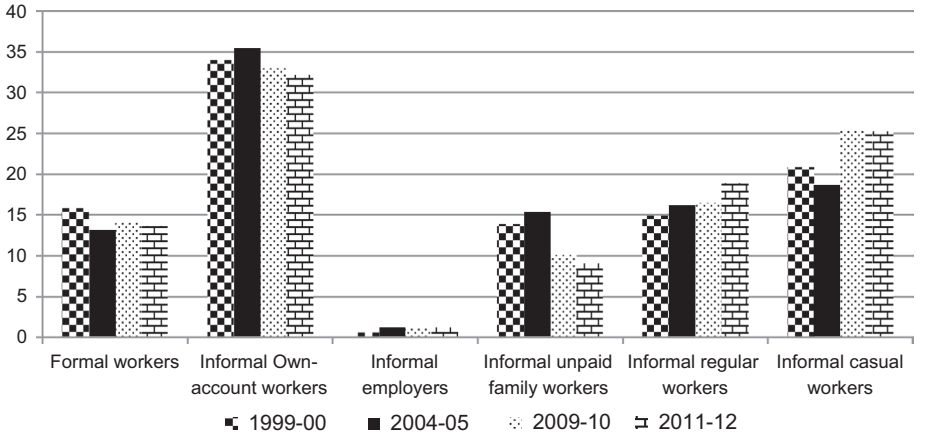

Figure 1. Informality rates among non-cultivator workers across employment categories. Source: Authors' calculations based on NSSO data.

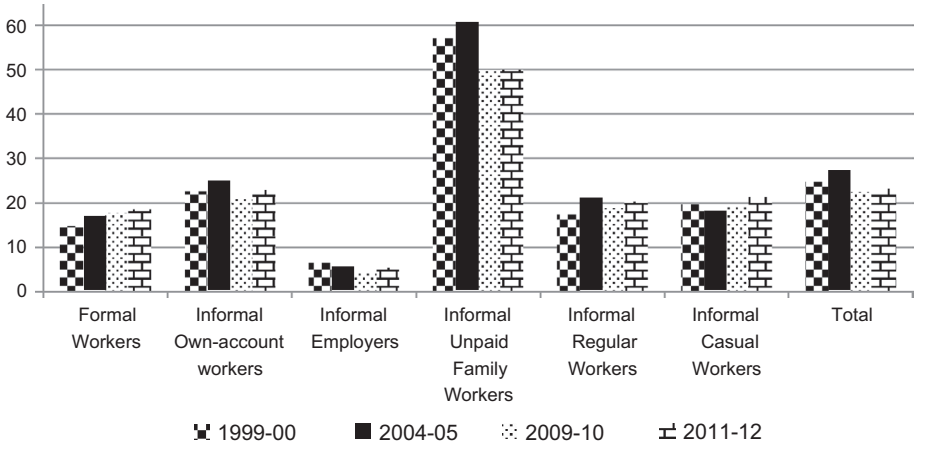

Figure 2. Percentage of female workers across employment groups. Source: Authors' calculations based on NSSO data.

Among the formal workers, young workers' share has been increasing, suggesting higher propensity of young workers to move from informal to formal employment, similar to the finding of Lehmann and Pignatti (2007) for Ukraine. However, it is puzzling to observe (contradictory to Lehmann and Pignatti 2007) declining share of workers aged between age 36 and 60, when they should look for a better and settled job in formal employment. This decline is commensurate to the effect of ascendancy in informal workers in own-account and casual works, in the particular age group. Looking at the poverty levels of different employment groups, we find that around half the workers were very poor in the informal categories. Comparing over time, there has been a significant reduction in poverty across all employment categories. Declining shares of very poor, poor and marginal workers within different segments of informal employment is desirable, and we observe this.

Table 2. Informality among non-cultivator workers across poverty categories (percentage).

Employment categories	Year	Poverty categories					MPCE	
		Very Poor	Poor	Marginal	Vulnerable	Middle Class & above	Mean	Std. error
Formal workers	1999–2000	10.83	16.23	15.78	32.53	24.63	1027	0.01
	2004–2005	7.04	12.77	13.90	31.34	34.95	1451	0.23
	2009–2010	5.85	9.77	11.83	32.30	40.25	2385	0.42
	2011–2012	3.72	6.99	10.03	32.28	46.99	3237	0.52
Informal own-account workers	1999–2000	34.68	25.73	15.95	17.11	6.54	597	0.003
	2004–2005	28.27	25.35	17.68	20.21	8.49	751	0.08
	2009–2010	22.63	22.88	18.27	24.63	11.60	1276	0.13
	2011–2012	15.26	20.46	19.04	28.96	16.27	1715	0.17
Informal employers	1999–2000	10.03	11.68	13.93	36.71	27.65	1170	0.05
	2004–2005	3.89	7.31	15.52	30.28	43.00	1754	0.98
	2009–2010	2.63	7.25	7.90	35.94	46.28	2788	1.65
	2011–2012	3.13	4	13.97	30.08	48.83	3245	1.43
Informal unpaid family workers	1999–2000	38.42	26.86	16.13	14.63	3.96	531	0.004
	2004–2005	30.09	26.68	18.57	18.38	6.29	681	0.10
	2009–2010	26.77	23.18	17.19	23.10	9.75	1178	0.21
	2011–2012	19.86	21.65	19.44	26.15	12.89	1551	0.28
Informal regular workers	1999–2000	28.87	24.3	17.32	21.73	7.78	699	0.006
	2004–2005	25.02	23.82	17.57	22.98	10.62	882	0.13
	2009–2010	19.35	20.53	17.61	28.21	14.30	1577	0.35
	2011–2012	11.71	17.87	17.61	33.38	19.43	1977	0.23
Informal casual workers	1999–2000	51.46	25.38	12.31	9.24	1.61	459	0.002
	2004–2005	43.32	28.83	14.72	11.18	1.96	555	0.05
	2009–2010	37.68	27.40	16.18	15.88	2.85	893	0.07
	2011–2012	26.71	27.3	19.53	20.8	5.66	1185	0.09
Total	1999–2000	33.9	24.01	15.38	18.38	8.33	646	0.002
	2004–2005	27.75	24.09	16.73	20.27	11.15	828	0.05
	2009–2010	23.76	21.66	16.51	24.04	14.03	1390	0.10
	2011–2012	16.17	19.77	17.64	27.95	18.46	1842	0.11

Note: Row total adds up to 100%.
Source: Authors' calculations based on NSSO data.

Further, we have witnessed that the decline in the share of 'Poor' and 'Very Poor' is comparatively much larger for the formal workers and 'informal employers' group compared to the Casual Workers (Table 2). This implies that over the years the burden of poverty has shifted more towards the disadvantaged groups such as the casual workers. Interestingly, poverty is considerably lower among informal employers compared to formal workers. The above picture indicates a heterogeneous informal employment with informal employers having incomes at par with the formal economy whereas the other components of the informal employment considerably poorer than the formal sector. This is also corroborated by the results for the mean household expenditure levels (Table 2). Apart from the heterogeneous nature of the informal employment, we further notice a significant variation in the household expenditure within specific employment groups. This is quite evident from Table 2 which shows that the variation in MPCE levels for some employment groups such informal employers is significantly higher compared to other groups such informal casual workers. Thus, informal employers, though on an average, fare comparatively better than the other employment groups, encompass significant diversity within itself.

Examining labour informality across religions, it was found that among formal workers, Hindus have a relatively higher representation, and Muslims have a significantly lower representation compared to their representation in the whole workforce. Further, within formal employment, Hindus' share is increasing, whereas their population share is declining, and

Table 3. Informality among non-cultivator workers across social castes and religions (percentages).

		Religions			Social groups			
Employment categories	Year	Hindu	Islam	Others	STs	SCs	OBCs	Others
Formal workers	1999–2000	85.68	6.55	7.77	6.25	14.14	25.64	53.98
	2004–2005	86	6.18	7.82	4.69	15.6	30.47	49.24
	2009–2010	86.35	5.78	7.88	5.49	15.29	33.12	46.11
	2011–2012	86.89	5.74	7.36	6.01	14.42	34.39	45.18
Informal own-account workers	1999–2000	77.49	16.58	5.94	4.27	16.94	38.57	40.22
	2004–2005	76.79	17	6.21	3.79	16.75	42.8	36.66
	2009–2010	78.16	16.54	5.3	3.47	16.97	44.44	35.11
	2011–2012	75.67	19.07	5.27	4.1	15.98	44.34	35.58
Informal employers	1999–2000	72.59	12.05	15.36	1.18	5.41	32.16	61.25
	2004–2005	75.05	12.53	12.43	0.49	5.26	31.05	63.21
	2009–2010	73.88	16.22	9.9	1.86	3.61	34.04	60.5
	2011–2012	71.03	18.37	10.6	1.61	4.99	36.7	56.7
Informal unpaid family workers	1999–2000	77.68	15.16	7.16	6.37	15.89	41.17	36.57
	2004–2005	77.73	15.67	6.6	4.32	14.95	48.56	32.17
	2009–2010	76.53	17.06	6.41	3.34	13.8	48.04	34.83
	2011–2012	75.16	18.91	5.92	4.33	14.34	49.07	32.27
Informal regular workers	1999–2000	80.29	13.21	6.5	3.79	15.03	34.9	46.29
	2004–2005	81.47	11.78	6.75	3.7	18.55	38.75	38.99
	2009–2010	80.32	12.81	6.86	3.98	18.36	38.16	39.5
	2011–2012	79.4	14.32	6.29	3.93	18.13	41.2	36.74
Informal casual workers	1999–2000	80.33	14.17	5.5	10.77	28.11	37.89	23.24
	2004–2005	81.31	13.05	5.65	10.3	29.85	40.08	19.78
	2009–2010	80.2	14.26	5.54	9.47	31.22	41.29	18.01
	2011–2012	80.33	14.86	4.81	10.25	30.11	43.41	16.22
Total	1999–2000	79.78	13.76	6.45	6.13	18.32	36.16	39.39
	2004–2005	79.73	13.74	6.54	5.15	18.92	40.77	35.16
	2009–2010	79.99	13.88	6.14	5.34	20.13	41.27	33.27
	2011–2012	78.97	15.28	5.75	5.87	19.45	42.5	32.19

Note: Row total adds up to 100%.
Source: Authors' calculations based on NSSO data.

for the Muslims the trend is reversed. Within informal regular and casual workers, both Hindu and Muslims have more or less equal share as their share in the total population. This suggests that, the rationed out workers from formal employment for Muslims have joined in the self-employment categories (i.e. informal own-account, informal employers, and unpaid family workers). Within self-employment categories, the sharpest rise for Muslims has happened for informal employers (Table 3). Earlier the increase in informal employers is concentrated among the relatively affluent section of the society (Table 2), it elucidates that not all Muslims rationed out from formal job are poor; in fact many are not. It appears at least for the majority of Muslims, rationing out of formal employment, informal employment is voluntary rather than through exclusion.

Examining informality across caste groups, we observed that compared to their overall representation in the workforce and total population, SCs have a larger representation in the casual worker category. Their representation is much lower among the other employment categories, especially the informal employer category. Similarly, among the Other Backward Caste (OBCs) we find a relatively higher representation among unpaid workers and a relatively lower representation among formal workers and informal employers. In sharp contrast, it was found that for the 'Others' category workers have a relatively higher representation of the formal workers and informal employers compared to the overall workforce (Table 3). Hence, a division of the employment categories was based on caste whereby the better employment categories are mostly held by the 'Others' group, whereas the other

marginalised social groups are mostly employed in the other inferior employment categories. So poverty falls more on these marginalised groups.

Considering the spatial composition of the employment categories, as expected, most of the formal workers and informal employers and regular workers are concentrated in the urban areas. Own-account workers, unpaid family workers and casual workers are concentrated mostly in rural areas. We have observed that share of informal casual workers has been increasing in the rural area. Remembering that the study is restricted to non-cultivator workers – the rising casualisation in rural areas may be due to implementation of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). MGNREGA provided guarantee of casual jobs to rural workers and given that wage rates are higher in MGNREGA than other types of works in rural setting, many women have worked there. This also partially explains the rising trend of female informal casual employment and the declining trend in rural and female informal unpaid family workers as women move out of home-based jobs to work in public works.

The gender compositions of the employment groups indicates that compared to their representation in the workforce, males are over-represented in formal employment and informal employer categories whereas women are mostly represented in the other employment categories. This is especially true for unpaid family workers (Figure 2). The above trends show that the precarious employment categories are restricted to women and the rural areas, whereas men and urban areas have a much higher representation in the better employment categories. This is not surprising, as females, and rural females in particular, have restricted access to formal education to gain skill.

The educational profile of the different employment groups show that education levels of formal workers are significantly superior to most of the other employment groups. A similar picture is evident from the technical education background of the workers. Informal employers have demonstrated quite a unique feature, as its share has increased over the years for the group having an educational level of 6 to 12 years, but for those having technical education, it had declined. This requires further investigation, may be at grass root level to examine the cause of this. Among the non-cultivator workers (where we need more vocation trained workforce) the share of workers having any vocational training is less than 5%. This poses a serious challenge for India to improve its manufacturing sector. We have observed a general improvement in the educational standards of the workers across all employment groups over the period (Figures 3 and 4).

Employment categories across various industries elucidate that that most of the formal employment is concentrated in the service segment, particularly in 'Commercial, Social, and Personal Services' and this is followed by 'Manufacturing' sector.

Components of self-employment and regular workers are mostly engaged in the 'Trade, hotels and transportation' sector followed by manufacturing. Within the self-employed, over 50% of informal employers are in 'Trade, Hotels and Transportation'. This may be due to growing tourism in India providing a tremendous opportunity for semi-skilled, relatively affluent individuals with some experience to start their own business in this sector. Unpaid family workers are mostly employed in the agriculture, manufacturing and 'Trade, Hotels and Transportation'. Finally, casual workers are predominantly employed in the 'Construction' sector and to some extent in the manufacturing and 'Trade, Hotels and Transportation' sector. Although there have been changes in the sectoral composition of employment, the overall pattern is similar over the period for most sectors, except for

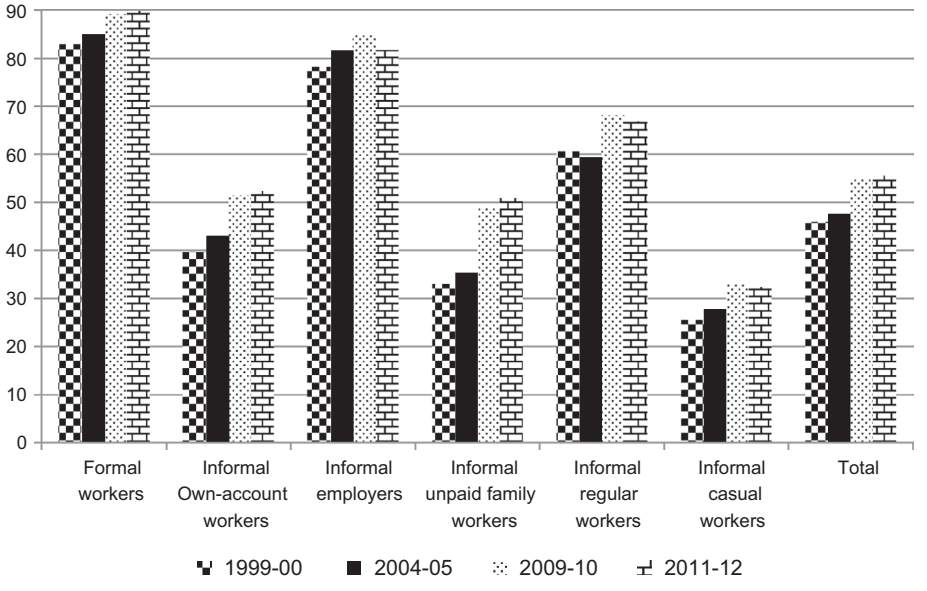

Figure 3. Percentage of workers with above primary schooling across employment groups. Source: Authors' calculations based on NSSO data.

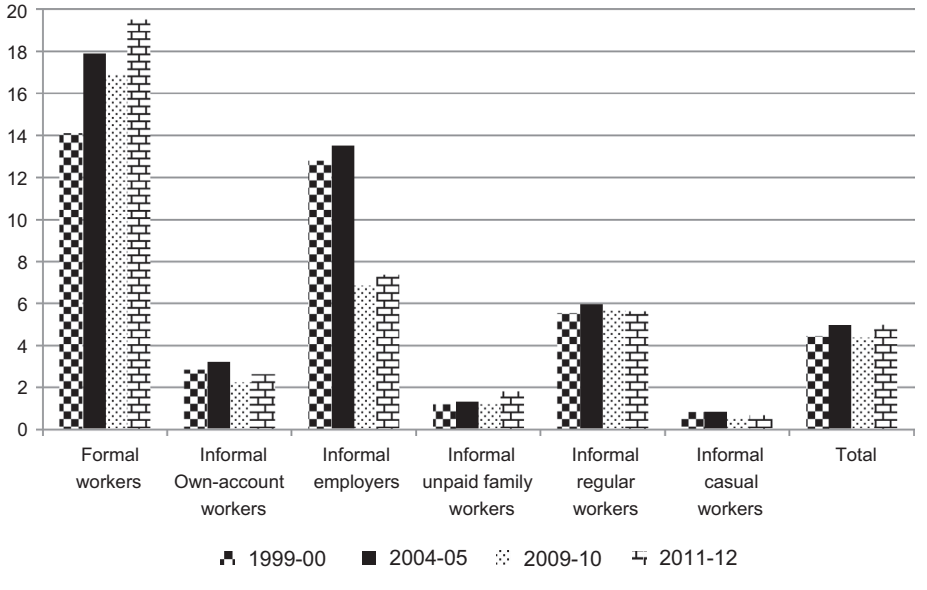

Figure 4. Percentage of workers with Technical Education across employment groups. Source: Authors' calculations based on NSSO data.

agriculture and construction. There is a sharp increase in the later and drop in the former. Though the movement of workers from agriculture to construction is desirable, given the condition of casual workers in the construction sector is dejected (PUDR 2009) – this movement must be taken with a pinch of salt.

Finally looking at the occupational classification of the workers, we find most of the own-account workers, unpaid family workers, informal regular and casual workers to be engaged in the lower skill jobs, whereas the formal employees as well as the informal employers are found to be disproportionately engaged in the higher skilled jobs, especially the highest skill occupations. Thus, there appears to be a very clear occupational segregation among the employment groups.

3.2. Micro-determinants of informality

It can be observed from the previous discussion that informal employment is heterogeneous and complex in India. So the natural question arises, who participates in the different components of informal employment compared to formal employment? The bivariate analysis of the categories of employment with several individual, household and industry classification in the previous sub-section is enlightening, but those characteristics cannot be interpreted as determinates of participation of informal employment unless we control for all other relevant factors.

Determinants of incidence of informality or self-employment have been examined by many researchers for African, European, Latin America, North America, Caribbean and other developing countries. However, studies on South Asia are limited. For instance Hazans (2011) and Williams and Windebank (2015) for European countries; Gindling and Newhouse (2014) for 74 developing countries; Bacchetta, Ernst, and Bustamante(2009) for developing countries; Bosch, Goni, and Maloney (2007) for Brazil, Feld and Schneider (2010) for OECD Countries; Loayza, Serven, and Sugawara(2009) for Latin America and the Caribbean; Chen and Doane (2008) for South Asia, and Dougherty and Escobar (2013) and Bosch and Maloney (2006) for Mexico etc. have looked at the characteristics of informality from an aggregate level. However, there are limited numbers of studies that have examined determinants of participation in informal employment at micro-level i.e. at the individual level. Notable among them are Lehmann (2015), and Lehmann and Zaiceva (2013) for Russian labour market, Bracha and Burke (2014) for United States, Radchenko (2014) for Egypt, Gasparini and Tornarolli (2009) for Latin America and the Caribbean, and Angel-Urdinola and Tanabe (2012) for Middle East and for Africa, by Dimova, Nordman, and Roubaud (2010).

Most of the above studies have dichotomised employment, hence did not examine the heterogeneity within informality. In the present study, the multinomial logistic model is applied to investigate the determinants of the different informal employment referring to the base outcome of formal employment. We present the results for the years 2004–2005 and 2011–2012 in Table 4. The results for 1999–2000 and 2009–2010 are reported in Appendix 2 Table A2. The base outcome for reference is formal employment. The models are significant overall with a Wald Chi-square significant at 1% level of significance. The Pseudo R^2 in both the periods is above 35% which is decent.

We firstly take a look at the coefficient of the first-stage predicted residuals which is found to be significant at 1% level of significance. Further, the F value for the test of joint significance of the instruments in the first stage regression is found to be very high at around 3.6×10^6 which is significant at 1% level of significance. The F value is much larger than the rule of thumb value of 10 proposed by Staiger and Stock (1997). Hence, we conclude that the instruments in our case are strong.

Table 4 elucidated that, controlling for other factors, both in 2004–2005 and 2011–2012, with additional years of education, the odds of working informally decreases for all categories of the informally employed, particularly for informal casual workers. This suggests that as an individual gains education they are less likely to be employed in informal casual work. This follows the earlier studies (Dimova, Nordman, and Roubaud 2010; Angel-Urdinola and Tanabe 2012; Lehmann and Zaiceva 2013; Radchenko 2014). Similarly, compared to formal employment, having no technical education significantly raises the odds of all the categories of informal employment except informal employers where the relationship is insignificant (Table 4). It is found that workers having technical education are over two times likely to get formal employment than in unpaid family worker, a finding similar to Dimova, Nordman, and Roubaud (2010) for West Africa.

Age, which is a proxy for experience, is exercising negative impact on the odds of different components of informality compared to the base outcome of formally employed, except for the informal employer. Compared to the formally employed every additional year of age lowers the odds of the different the informal employment groups. Similarly, the coefficient on the squared term of age is significant and greater than one indicating the probability of joining different informal employment groups decreases at increasing rate after a certain age. Comparable observation was made in previous literature for different developing countries (Dimova, Nordman, and Roubaud 2010; Angel-Urdinola and Tanabe 2012; Lehmann and Zaiceva 2013; Radchenko 2014). However, this relation is not statistically significant for the informal employers so we may conclude there is no significant difference between the formally employed and informal employers with respect to age. But the odd ratio is greater than one suggesting a preference of informal employer than formal job consistent with our bivariate analysis earlier and coherent with the finding of Lehmann and Zaiceva (2013) for the study of Russian labour market.

Post-estimation results of the relation of informality with age using STATA's 'margins' command reveals a varied response of the probability of different categories of informality to age. With casual and regular workers, the probability of informality shows a declining trend with an increase in age. However, we have observed a rising trend of informality regarding age for own-account workers and employers. Informal unpaid family workers depict a U-shaped pattern with the probability of informality falling steeply at lower ages before rising slowly again at around the age of 50 (Figure 5).

The observed patterns depict the different responses of informality towards age. Workers move into certain categories such as informal regular, casual and unpaid family workers at a relatively young age whereas for the other categories such as formal workers, informal own-account and employers the move is undertaken in the later ages. Hence, it may be possible that workers enter the workforce at a younger age through the casual, regular and unpaid worker categories and as they accumulate on-the-job-skills, experience and social capital they move on to the possibly better employment groups within the informal employment or the formal sector. It may also be possible that young members of households start as unpaid family workers, casual or regular workers and in later age groups with enough younger income earners within the household can better absorb the precariousness and risks of self-employment and move on to such jobs.

The coefficient of log of MPCE on the odds of different informal employed groups is less than one in both the periods. With unpaid family workers, as well casual workers every percentage increase in MPCE lowers the odds of that choice significantly by about 90–99%.

Table 4. Multinomial logistic regression results: odd ratios.

	Informal own-account worker		Informal employer		Informal unpaid family labour		Informal regular worker		Informal casual worker	
Independent variables	2004–2005	2011–2012	2004–2005	2011–2012	2004–2005	2011–2012	2004–2005	2011–2012	2004–2005	2011–2012
Individual and household level covariates										
Years of school	0.87*	0.87*	0.91*	0.93@	0.91*	0.96*	0.92*	0.90*	0.85*	0.85*
Age	0.96*	0.98*	0.99@	0.98	0.92*	0.94*	0.92*	0.94*	0.92*	0.95*
Age^2	1.01*	1.00*	1.01@	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*
Log of MPCE	0.17*	0.09*	0.37*	0.11*	0.03*	0.01*	0.16*	0.18*	0.02*	0.02*
Dummy Islam (Base: Hindu)	1.54*	1.71*	1.34#	1.89@	0.99	0.97	0.99	1.32@	0.94	1.18
Dummy Other religious community (Base: Hindu)	1.29*	1.43*	1.39@	1.83@	1.56*	2.07*	1.31@	1.49*	1.54@	1.89*
Dummy ST (Base: General)	0.39*	0.33*	0.08*	0.22@	0.18*	0.13*	0.44*	0.39*	0.51*	0.43*
Dummy SC (Base: General)	0.54*	0.58*	0.30*	0.25*	0.28*	0.26*	0.49*	0.61*	0.59*	0.62*
Dummy OBC (Base: General)	1.05	1.01	0.68*	0.66@	0.86#	0.72*	0.83@	0.86	0.93	1.01
Dummy of Technical: No Education = 1, else = 0	1.15	1.75*	1.10	2.34#	1.61*	1.40@	1.06	1.31@	1.10	1.06
Dummy Rural = 1, Urban = 0	1.18#	0.78#	0.81	0.52#	0.69*	0.30*	0.64*	0.53*	0.78@	0.65*
Dummy Marital Status: Married/divorcee/ widow/widower = 1, Unmarried = 0	1.03	1.55*	1.25	2.54@	0.48*	0.66@	0.65*	0.81@	0.59*	0.92
Dummy Gender: Male = 1, Female = 0	0.48*	0.67@	2.15*	3.03*	0.08*	0.16*	0.59*	0.86	0.72@	1.11
Dependency Ratio	0.82	0.53*	1.23	0.56	0.22*	0.07*	0.40*	0.48*	0.30*	0.18*
1st Stage Residuals	1.92*	4.28*	3.29*	9.34*	10.40*	66.16*	2.36*	2.78*	8.46*	11.5*
Skill level of the occupations (Base: Low Skill Jobs)										
Lowest Skill jobs	0.37*	0.47*	0.04*	0.15*	0.09*	0.26*	1.11	0.90	3.23*	3.00*
High Skill jobs	1.43*	1.09	0.76	1.39	0.72*	0.34*	0.77@	0.92	0.52*	0.68
Highest Skill jobs	5.83*	7.62*	18.04*	22.22*	8.89*	9.86*	1.01	0.79#	0.21*	0.19*

Industrial classification (Base: Trade Hotels & Transportation)										
Dummy Agriculture	2.24@	3.52*	1.24	5.00*	3.63*	6.03*	0.45#	0.38*	2.16@	6.21*
Dummy Manufacturing	0.20*	0.33*	0.21*	0.45*	0.20*	0.32*	0.38*	0.53*	0.69@	0.92
Dummy Construction	0.57*	0.46*	0.75	0.94	0.17*	0.14*	0.39*	0.44@	18.01*	18.22*
Dummy Finance, Insurance & Real Estate	0.26*	0.43*	0.16*	0.14*	0.17*	0.10*	0.54*	0.45*	0.34*	0.24@
Dummy Commercial, Social & Personal Services	0.04*	0.10*	0.03*	0.08*	0.03*	0.06*	0.27*	0.43*	0.09*	0.18*
Dummy Mining, Electricity & Water Supply	0.01*	0.02*	0.01*	0.01*	0.01*	0.06*	0.07*	0.16*	0.57@	0.52*
State Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	2004–2005							2011–2012		
No. of observations	137,072							116,186		
Wald χ^2 (p value)	0.00							0.00		
Pseudo R^2	0.3541							0.3806		

Note 1: Significance levels * 1%, @ 5%, # 10% are based on standard error clustered on state level.
Note 2: Estimated coefficients are calculated using sampling weights.
Source: Authors' calculations based on NSSO data.

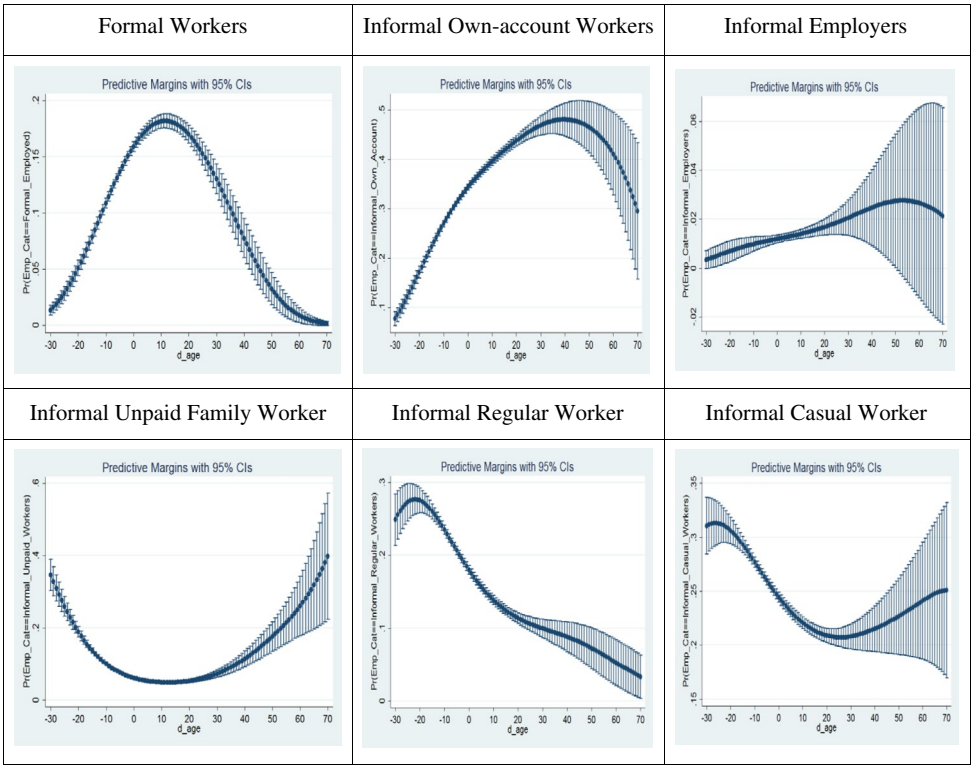

Figure 5. Probability of employment in various formal and informal categories against age (2011–2012).
Source : Authors' calculations based on NSSO data.
Note : The vertical axis denotes the probability of various forms of formal and informal employment whereas the horizontal axis depicts age in a continuous scale.

For regular informal workers and own-account workers that effect is moderated to about 80–90% but is high. This is further moderated in the case of informal employers where every percent increase in MPCE lowers the odds of that choice by about 63% in 2004–2005, which has risen to 89% by 2011–2012 compared to formal employment. The above results show that controlling for other factors, rising MPCE significantly lowers the odds of the different informal employment groups.

Socio-cultural and religious factors have been major factors for household decisions on economic activities. Looking at the odds of different informality by religious communities, we have observed that referring to the majority Hindus, being from minority religious communities like Islam and other religions significantly raises the odds of all the categories of informal employment. Workers from Islamic and other religious communities are more likely to be in informal employment that Hindus. However, contrary to the expectation, *ceteris-paribus*, among the social strata marginal social groups like SCs, and STs were more likely to be in formal employment than general caste (Others caste) referring to any of the informal employment categories. This may be the effect of the positive discrimination policies in reservation of public sector jobs in favour of the SCs and STs. However, it may also reflect that being SC or ST worker, on its own, may not imply discrimination regarding access to decent jobs but rather it is the endowments of the workers in education and

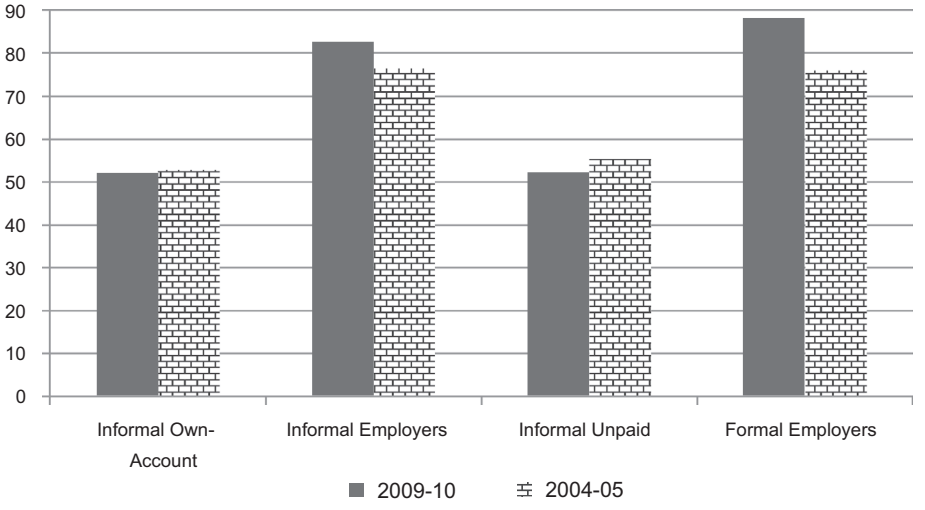

Figure 6. Percentage of the self-employed reporting their earnings as remunerative. Source: Authors' calculations based on NSSO data.

skills which compels them into involuntary informal jobs. With OBC, the likelihood of in the informal employer and informal unpaid family worker is significantly lower than the general caste (Table 4).

Looking at the effect of gender, with reference to the base outcome of formal employment, in informal employer categories, males are more likely to participate than females. Being female, on the other hand, significantly raises the odds of unpaid family labour and own-account work. Our findings differ from earlier findings where most found informality either falls more on women (Dimova, Nordman, and Roubaud 2010; Angel-Urdinola and Tanabe 2012; Radchenko 2014) or on men Lehmann and Zaiceva (Table 4). Regarding the rural-urban composition of informality, we find the odds of unpaid family work, informal regular and casual work is lower than one signifying the greater likelihood of these employment groups in urban areas.

Looking at the industrial composition of the different informal employment categories, we have observed that compared to the Trade, transport and communications sector the odds of informality are higher in the agricultural sector for all informal employment categories except for regular salaried. Hence, we conclude there is a high concentration of unpaid family workers, own-account workers, employers and casual workers in the agricultural sector. In the construction sector, the odds of being an informal casual worker are higher and those of other groups are lower compared to the reference category of formal employment. Further, the odds have risen for casual workers. Hence, we have witnessed a high and rapidly increasing casualisation of workers in the construction. For the Mining, electricity and water supply; Manufacturing sector; Finance, insurance and real estate sector; and the Commercial, Social & Personal Services sectors informality is significantly lower than the reference sector and seems to have risen over the period. Finally, the coefficients of the occupational groups show that the self-employed groups such as own-account workers, unpaid workers and informal employers are over-represented in the 'Highest Skill Jobs'

relative to the formally employed whereas the other employment groups especially the casual workers are engaged mostly in the 'Lowest Skill Jobs'.

The above discussion points to significant diversity within the informal employment. Informal Employers as an employment group behaves distinctly from the other informal groups, and their characteristics are similar to the formal workers. Hence, we further examined the issue by considering the opinion of the self-employed about their remuneration. Within the NSSO EUS survey, the self-employed were asked whether they find their employment remunerative. The result reported in Figure 6 has suggested the percentage of employed reporting positively to the question is considerably higher with the informal employer compared to the other two informal groups. The percentage is similar to the formal employers. This further corroborates our findings that the nature of informality for the informal employers is voluntary and it as a group subscribes more to the 'Informality as a choice hypothesis' but other informal employees are not.

4. Conclusion

Labour informality is a challenging issue facing the world economy today. The significant and growing literature on this issue highlights its significance to the current development debate. This study points out the considerable diversity within the informal employment. Multinomial logistic analysis conducted on the data reveals there is significant heterogeneity diversity among the informal categories with respect to age, poverty, educational attainment, gender and industrial affiliation. High complexity is involved regarding formal and informal employment. Therefore, single-instrument policy for all workers may not lead us anywhere. There is a need for specific policy measures for different employment groups to address the diverse nature of informality in the country. So the recent attempt in India to agglomerate the different labour laws (MoLE 2015; Secki 2015) needs careful attention.

The policy instruments that must be developed for tackling problems in the informal employment given the heterogeneous nature of the sector must be specific to the nature of informality. This includes a macroeconomic environment that supports the generation of quality employment generation rather than focussing only on growth per se. Further, legislation of specific policies to improve the conditions of the poor including the provision of basic security such as food security, provision of basic health and education are needed (Unni and Rani 2003). Particular policies are also required for specific sectors like the construction sector. Studies have also found that the adverse effects of globalisation on employment and working conditions are moderated to a large extent if the country has proper safety nets in place in minimum wage legislations and other labour standards (Bacchetta, Ernst, and Bustamante 2009). For informal employers, given the voluntary nature of their informality, this needs to be supplemented through the dismantling of red-tapeism and other bureaucratic regulations and improving access to infrastructural services. This is especially critical given their track record and potential in the overall growth and employment generation process in developing countries and East Asia in particular (Sinha 2003; Shi and Michelitsch 2013). The recent start-up India drive by government of India (GoI 2016) is a welcome step towards this, as it aims at reducing the regulatory burden on start-ups allowing them to focus on their core business and keep compliance cost low and creates employment opportunity. However, the drive should focus more on manufacturing sector than service sector. Such policies would however not be very effective for informal

casual and regular workers and some specific groups such as home-based workers as any productivity improvement in their case would be squeezed by intermediaries and global firms through lower prices of the informal products. Hence, in their case appropriate steps need to be to improve labour standards in an integrated way through global cooperation (Pollin and Heintz 2003).

Notes

1. The concept of heterogeneity here emphasises the diversity or variation within informal employment. This is in contrast to the homogeneity approach which considers informal employment as a single homogenous group without any dissimilarities or distinctions within it.
2. A stratified multi-stage design is adopted in NSSO EUS where the First Stage Units (FSUs) were the census villages in the rural sector and Urban Frame Survey (UFS) blocks in the urban sector. The ultimate stage units (USU) were households in both the sectors. In all, the number of households (individuals) surveyed in different rounds were- 120,578 (596,686) in 1999–2000; 124,680 (602,833) in 2004–2005; 100,957 (459,784) in 2009–2010 and 101,724 (456,999) in 2011–2012. The entire questionnaire for the NSSO EUS survey is available from their website: http://mail.mospi.gov.in/index.php/catalogue/143/download/1636 for the 68th Round, http://mail.mospi.gov.in/index.php/catalogue/18/download/119 for the 66th Round, http://mail.mospi.gov.in/index.php/catalogue/24/download/176 for the 61st Round, and http://mail.mospi.gov.in/index.php/catalogue/54/download/723 for the 55th Round.
3. NSSO EUS divided enterprises into different sub-types and size-classes as discussed in Appendix 1. Further, workers are grouped into five status codes- own-account self-employed, employer, unpaid family worker, regular salaried, casual wage labour- in public works &other types of works. Additionally, workers were enquired about access to social security benefits such as Provident Fund/Pension, gratuity, health care and maternity benefits etc.
4. The study uses the usual status criteria in determining the employment status. The usual status criteria combine the principal and subsidiary status criteria. NSSO EUS makes a distinction between principal and subsidiary status of a person. The principal status determines the employment status of a person based on the activity on which he has spent a relatively longer time during the last year. The subsidiary status on the other hand is based on the secondary activity (other than the principal activity) of the person performed for a shorter time period not less than 30 days. Under the usual status criterion, hence, workers are those performing any economic activity (work) under either principal or subsidiary status. Thus a person is considered as a worker if he is employed under subsidiary status even if he is not working under the principal status. For further details please refer to National Sample Survey Office (NSSO 2014).
5. The five distinct categories based on 'usual status' of the workforce are discussed as follows: Own-account workers are defined as self-employed persons who operated their enterprises on their own-account or with one or a few partners without hiring any labour. Employers on the other hand comprise self-employed persons working on own-account or with one or a few partners and hired labour for their enterprises. Unpaid family workers are self-employed persons who assisted the running of their household enterprise working full or part time without any regular salary or returns for the work performed. Regular workers on the other hand worked in others' farm or non-farm enterprises, receiving a salary or wages on a regular basis. Finally, casual workers, in contrast to regular employees, are casually engaged in others' farms or non-farm enterprises and received wages according to the terms of a daily or a periodic work contract.
6. Informal own-account workers and informal unpaid family workers comprise entirely of the own-account workers and unpaid family workers respectively since they do not have access to social security benefits. Informal employers consist of employers in the unorganised sector. Informal regular workers and informal casual workers comprise regular and casual workers

respectively without access to social security benefits. Refer to Appendix 1 and Endnote 3 for further details. Since our objective is to investigate the heterogeneity in the characteristics of the informal workers, the study divides the informal workforce on the basis of 'usual status' of the workers.

7. Formal employment comprises regular and casual workers with access to social security benefits as well as employers in the organised sector. Refer to Appendix 1 and Endnote 3 for further details. There are broadly two definitions of informality used in the literature. The first is based on the type and size of enterprise leading to organised vs. unorganised sector distinction. The second is based on the access to social security benefits as a criterion leading to the formal vs. informal employment distinction. We use the second of the two definition for our study.
8. To derive our variable, we consider the years of education completed by an individual. For example, a person having completed primary school would have five years of schooling whereas a person with graduate degree will have 15 years of education. For 'Below Primary' education, we take the expected years of education i.e. the average of four (Max) and zero (min) years of completed education by the person.
9. Our poverty estimates are based on the Rangarajan Committee methodology (Planning Commission 2014). To arrive at the poverty lines for the earlier years, we deflate the 2011–2012 poverty lines for rural and urban sector separately by the CPI for Rural Workers and CPI for Industrial Workers separately. Our poverty estimates are likely to be different from the Rangarajan estimates due to different data sets and methods employed. Following the methodology proposed by Sengupta, Kannan, and Raveendran (2008), households are classified into five mutually exclusive groups of Poverty Category: (1) Very Poor If MPCE $\leq$ 0.75 times poverty line (PL); (2) Poor If 0.75 < MPCE $\leq$ 1 PL; (3) Marginal If 1 PL < MPCE $\leq$ 1.25 PL; (4) Vulnerable If 1.25 PL < MPCE $\leq$ 2 PL; and (5) Middle Class and above If MPCE > 2 PL.
10. Of the total population of India in 2001, 80.5% were Hindus while Muslims account for 13.4% and other religious communities 6.1%. In 2011, the figures were: 79.8, 14.2, and 6% respectively. With respect SCs and STs, in 2001 their share was 16.2 and 8.2 percentages respectively; and in 2011 share increased to 16.6 and 8.6%. 2001 population share data were considered as the reference points for 1999–2000 and 2004–2005; and 2011 census data were for 2009–2010 and 2011–2012.
11. We have followed Ministry of Labour and Employment (MoLE) report in classifying workers according to skill levels for National Classification of Occupations 2004 (MoLE n.d.). According to the classification, Legislators, Senior Officials, Managers and Professionals are clubbed together into the Highest Skill jobs. Technicians are grouped into High Skill jobs. Clerks; Service & Sales workers; Skilled Agricultural & Fishery Workers; Craftsmen and Machine Operators are grouped into the Low Skill jobs. Finally, Elementary Unskilled jobs are grouped into Lowest Skill jobs.
12. We have used the concordance tables for NCO 1968 and NCO 2004 to generate the equivalent of NCO 2004 codes for 2004–2005 and classify their skill levels accordingly.
13. The 25 state regions considered in the study include Jammu & Kashmir; Himachal Pradesh; Punjab & Chandigarh; Uttaranchal; Haryana; Delhi; Rajasthan; Uttar Pradesh; Bihar; Tripura; Assam; West Bengal; Jharkhand; Orissa; Chhattisgarh; Madhya Pradesh; Gujarat; Maharashtra, Dadra, Daman & Diu; Andhra Pradesh; Karnataka; Goa; Lakshadweep, Andaman & Nicobar Islands; Kerala; Tamil Nadu & Pondicherry; and North-Eastern states excluding Assam & Tripura.

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Appendix 1

Table A1. Identifying informal employment.

Enterprise type	Number of workers in the enterprise					
	Missing	less than 6	6 & above but less than 10	10 & above but less than 20	20 & above	Not Know
Missing	****					
Proprietary male						
Proprietary female						
Partnership with members of same household						
Partnership with members of different household						
Public sector						
Public/private limited company						
Co-operative societies/trusts						
Employer's household						
Others						

Source: Bhalla (2009).

The division of workers into the organised and unorganised sectors is defined as follows-

(1) Cells shaded dark belongs to the unorganised sector.
(2) Cells shaded light belongs to the organised sector.
(3) Cells marked with **** belongs to the unorganised sector for all usual status except regular and casual workers in government works. Casual workers in public works belong to the organised sector. Similarly, regular workers belong to the unorganised sectors if they have social security benefits or information on the variable is missing. For the 55th Round, information on enterprise type and number of workers in the enterprise was missing even for the non-cultivation agricultural workers. Hence, in their case, following the NCEUS methodology, forestry workers (with NCO-1968 code 66) is organised and the rest of the non-cultivation workers within agriculture are unorganised.

The division of workers into the formal and informal employment is done on the basis of presence of social security benefits and unorganised sector status as follows-

(1) Own-account workers and unpaid family workers as categorised into informal employment.
(2) Casual workers in public works and other works, and regular workers, are categorised into the formal or informal employment based on the presence or absence of social security benefits.
(3) Employers are categorised into formal or informal employment based on whether they belong to the organised or unorganised sector.

Appendix 2

Table A2. Multinomial logistic regression results: Odd ratios.

	Informal own-account worker		Informal employer		Informal unpaid family labour		Informal regular worker		Informal casual worker	
Independent variables	1999–2000	2009–2010	1999–2000	2009–2010	1999–2000	2009–2010	1999–2000	2009–2010	1999–2000	2009–2010
Individual and household level covariates										
Years of school	0.85*	0.86*	0.94@	0.93@	0.92*	0.94*	0.91*	0.89*	0.85*	0.85*
Age	0.95*	0.98*	0.98#	1.01	0.90*	0.94*	0.91*	0.94*	0.91*	0.95*
Age^2	1.00*	1.00*	1.00*	1.00@	1.00*	1.00*	1.00*	1.00*	1.00*	1.00*
Log of MPCE	0.34*	0.16*	0.46	0.19*	0.03*	0.01*	0.19*	0.29*	0.04*	0.02*
Dummy Islam (Base: Hindu)	1.48#	1.58*	1.43@	1.91@	0.95	0.88	1.03	1.22	1.21	1.42*
Dummy Other religious community (Base: Hindu)	1.16*	1.31*	2.21*	1.61@	1.62*	1.54*	1.14@	1.33*	1.35*	1.68*
Dummy ST (Base: General)	0.47*	0.37*	0.19*	0.16*	0.25*	0.15*	0.41*	0.56*	0.58*	0.48*
Dummy SC (Base: General)	0.72@	0.68*	0.46@	0.27*	0.35*	0.25*	0.51*	0.64*	0.81	0.59*
Dummy OBC (Base: General)	1.26*	1.08	1.06	0.84	0.95	0.69*	0.83*	0.79*	1.09	0.80*
Dummy of Technical No Education = 1, else = 0	1.43*	1.64*	1.12	2.26*	1.51*	1.35@	1.17@	1.22#	1.71*	1.01
Dummy Rural = 1, Urban = 0	1.47*	1.17	1.11	0.88	0.82	0.56*	0.67*	0.69*	0.91	0.83#
Dummy Marital Status: Married/divorcee/widow/widower = 1, Unmarried = 0	0.96	1.34*	1.21	1.73@	0.43*	0.57*	0.54*	0.68*	0.50*	0.68*
Dummy Gender : Male = 1, Female = 0	0.56@	0.57*	1.59	2.08#	0.10*	0.10*	0.68*	0.76@	0.78	0.74@
Dependency Ratio	1.06	0.76	1.61	1.14	0.15*	0.11*	0.44*	0.80	0.23*	0.26*
1^{st} Stage Residuals	1.07	2.40*	2.24	6.23*	13.05*	34.56*	2.27*	1.55#	5.97*	10.36*
Skill level of the occupations (Base: Low Skill jobs)										
Lowest Skill Jobs	0.39*	0.62*	0.15*	0.18*	0.27*	0.36*	0.73*	0.86	2.90*	3.57*
High Skill Jobs	0.61*	1.49*	1.16	1.09	0.38@	0.49@	0.96	0.93	0.49*	0.43*
Highest Skill Jobs	4.75*	9.59*	9.42*	32.18*	6.03*	14.05*	1.01	0.84	0.36*	0.42*

Industrial classification (Base: Trade Hotels & Transportation)										
Dummy Agriculture	1.97@	3.56*	1.00	1.64	2.66*	5.55*	0.45@	0.51	4.32*	4.49*
Dummy Manufacturing	0.19*	0.24*	0.34*	0.39*	0.25*	0.20*	0.45*	0.40*	0.74@	0.69@
Dummy Construction	0.77	0.35*	0.91	0.81	0.25*	0.17*	0.72	0.37*	22.33*	12.71*
Dummy Finance, Insurance & Real Estate	0.26*	0.25*	0.15*	0.23*	0.22*	0.12*	0.62*	0.42*	0.34*	0.46*
Dummy Commercial, Social & Personal Services	0.05*	0.04*	0.02*	0.06*	0.06*	0.03*	0.29*	0.26*	0.12*	0.09*
Dummy Mining, Electricity & Water Supply	0.01*	0.01*	0.11*	0.09*	0.02*	0.03*	0.11*	0.10*	0.61	0.41*
State Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year				2004-05				2011-12		
No. of observations				137072				116186		
Wald χ^2 (p value)				0.00				0.00		
Pseudo R^2				0.3541				0.3806		

Note 1: Significance levels * 1%, @ 5 %, # 10% are based on standard error clustered on state level.
Note 2: Estimated coefficients are calculated using sampling weights.
Source : Authors' calculations based on NSSO data.