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Rupayan Pal

Indira Gandhi Institute of Development Research, Mumbai
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Estimating the Probability of Trade Union Membership in India: Impact of Communist Parties, Personal Attributes and Industrial Characteristics[1]

Rupayan Pal

Indira Gandhi Institute of Development Research (IGIDR)
General Arun Kumar Vaidya Marg
Goregaon (E), Mumbai- 400065, INDIA
Email (corresponding author): rupayan@igidr.ac.in

Abstract

The paper analyses the impact of the reach of communist parties, the degree of political activism, personal attributes of workers, and industrial characteristics on the individual decision to unionise for Indian non-agricultural regular workers using micro data from the 2004-05 Employment and Unemployment Survey, NSSO, linked to state-level factors. A notable result is that the reach of communist parties has considerable effect on unionisation probability. Moreover, it seems that mere existence of communist parties in a state also facilitates unionisation to some extent. State-level political activism and unemployment rate also influence the individual decision to be unionist. The paper concludes also that worker's gender, marital status, ethnic background, employment status, experience, occupation, sector of employment, establishment size, and type of industry remain important in the determination of union membership.

Key words: Communist Party, Decision, Probability, State, Trade Union

JEL Code(s): J51, P48, C25

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1. Introduction

This paper analyses the determinants of individual decision to unionise for non-agricultural regular workers in India. We are primarily interested in answering two questions: Do the reach of communist parties and the degree of state-level political activism affect individual decision to unionise? What are the characteristics of the individuals who join trade unions?

Both the microeconomic theory and the empirical literature on union membership decision have been enriched by many studies in recent years. It helps us to understand a range of important issues such as partial union coverage (Bulkley and Myles, 2001), role of social customs on formation of trade unions (Naylor, 1989; Booth, 1985), role of product market competition (Moreton, 1998), effect of globalization (Dreher and Gaston, 2007; Martin and Brady, 2007), impact of personal attributes and job characteristics on individual decision (Bryson and Gomez, 2005; Arulampalam and Booth, 2000; Green, 1990; Booth 1986 to name a few), etc.. However, existing empirical studies of individual union status have primarily focused on developed countries. Little is known about trade union memberships in developing countries like India. In addition, existing studies have not attempted to estimate the impact of political factors at sub-national level, which assess the context of unionisation, on individual decision to unionise, despite the fact that the interconnection between trade unions and political factors has long been recognised. In a society with more politically active population, workers are likely to be more inclined towards trade unions, compared to that in a less politically active society. Ideology of political parties also plays crucial role in facilitating unionisation. Traditionally, communist parties have encouraged class-consciousness in societies and in turn, facilitated collective organisations. High level of political activism and/or support base of communist parties might also lead to high social cost of abstaining from trade union. Therefore, it is important to consider the effects of political factors like the reach of communist parties and the degree of political activism while analysing the determinants of individual decision to unionise.

This paper aims to consider the role of the reach of communist parties, the degree of political activism, personal attributes of workers and industrial characteristics on union membership decision, using micro-data set provided by the 2004-05 Employment and Unemployment Survey (EUS), which is a nationally representative survey conducted by NSSO, India, and state-level data on political and institutional factors. Wide variations across states in India in terms of political activism, reach of communist parties, labour market situation, and also union density draws special attention to analyse the impact of communist parties and political activism at sub-national level, along with the impact of personal attributes of workers and industrial characteristics, on individual decision to unionise. The estimates suggest that a mixture of these factors determine an individual's propensity to unionise.

A notable result of this empirical work is that the reach of communist parties has significant effect on unionisation probability. The predicted probability of union membership of a 'basic worker'[2] increases by 10% (6%) in mining (manufacturing) industry, in an otherwise identical situation, if communist parties' support base increases from zero to a moderate or high level. Moreover, econometric analysis reveals that mere existence of communist parties might also influence individual decision to unionise to some extent. State-level political activism and unemployment rate also influence the individual decision significantly. Other than these factors, which assess the context of unionisation, worker's gender, ethnic background, employment status, experience, occupation, sector of employment, establishment size, and type of industry significantly affect the probability that a worker will be a trade union member. Out of three industrial characteristics that we consider, sector of employment has the largest impact on individual decision: the predicted probability of a 'basic worker' to join union increases by more than 42% if she moves from private sector to public sector, in an otherwise identical situation. Interestingly, high level of educational attainment, except technical degree and vocational training, does not seem to have adverse impact on individual's propensity towards unionisation.

We note that Martin and Brady (2007), which is a cross-country study on unionisation across 39 less developed countries including India, is closely related to this paper. While Martin and Brady (2007) has assessed the role of communist regimes by categorising countries according to the nature of political institution: communist legacy or not, it completely neglects

[2] See Section 5.1 for details.

variations across states within a country in terms of political and economic factors and fails to assess the role of political parties with different ideologies within a democracy. The present paper differs from Martin and Brady (2007) in several respects. First, it estimates the impact of the reach of communist parties and also of the degree of political activism at sub-national level, which is important particularly in Indian context since there is considerable variation across states in terms of the reach of communist parties and political activism. Second, it uses controls for variation across states in terms of labour market situation and standard of livings. Third, it estimates the impact of industrial characteristics, along with the impact of political factors and personal attributes, on individual's propensity to unionise.

The rest of the paper is organised as follows. We begin in Section 2 by providing a brief description of political scenario and unionisation in India. Section 3 describes the data sources and the variables used. Section 4 outlines the estimation methodology. The results of estimation are presented in Section 5. Section 6 offers some concluding remarks.

2. Political Scenario and Unionisation in India: 2004-05

India, world's largest liberal democracy with 28 states and seven union territories[3], has promoted a federal parliamentary multi-party representative democratic framework of politics. All 28 states, the union territory of Puducherry, and the national capital territory of Delhi have elected governments, where politics is dominated by several national parties, Bharatiya Janata Party (BJP), Bahujan Samaj Party (BSP), Communist Party of India (CPI), Communist Party of India–Marxist (CPM), Indian National Congress (INC) and Nationalist Congress Party (NCP), and various state-level political parties. Although political framework is same in all states, there is notable variation across states in terms of the functioning of state level political systems and political activism. In state legislative assembly elections held by 2004, the range of voter turnout in the electoral process remained very high (46.51%), with the maximum at 90.21% in Manipur. Bihar scored the second lowest (45.85%), followed by Jammu & Kashmir (43.7%).[4] Such variation in political activism across states in India is a persistent phenomenon.[5] As expected in such scenarios, support base of political parties with different ideologies also vary widely across states. For example, communist parties, which are widely known for grass-root level organisations, mobilisation of the working class,

[3] Out of seven union territories, Delhi is the national capital territory.
[4] Data source: Statistical Reports of General Election to the Legislative Assembly of various states, Election Commission of India, New Delhi.
[5] See (Besley and Burgess 2002), for variation in political activism across states in India during 1958-1992.

encouraging class-consciousness and facilitating trade unions, have very high support base in three states, namely Kerala, Tripura and West Bengal, but no support base at all in Arunachal Pradesh and Nagaland. Such variations in reach of communist parties, together with variation in political activism, across states likely to have significant consequences on industrial relations in general, and trade union memberships in particular.

According to the central legislation of India, the Trade Unions (Amended) Act 2001[6], which is administered by concerned state governments, a registered trade union in India needs to have at least 10% or 100 of the workers as its members, subject to a minimum of seven persons engaged or employed in the establishment or industry.[7] Outsiders, i.e., non-employees, can also be members of trade unions and serve as office-bearers.[8] There are multiple trade unions within establishment as well as large centralised unions. It is widely observed that political parties play crucial roles in formation of trade unions as well as in collective bargaining in India. Moreover, most of the trade union leaders, who are outsiders in many cases, are affiliated to political parties.

In India, collective bargaining agreements apply to all workers covered by a particular agreement irrespective of their individual union status, as in all 'open shop' contexts. Guidelines for conflict resolution in the process of collective bargaining are provided by the central legislation, the Industrial Dispute Act 1947. However, state governments have full authority to amend this act. Most of the state governments have used this opportunity to strengthen or weaken various provisions of this act time to time (see Besley and Burgess 2004), which were largely guided by political interests. As a result, there are wide variations in labour practices across states in India. The 'state-dominated' pluralism, along with ambiguous labour laws regarding many aspects of industrial relations, eventually led to a multiplicity of political party based trade unions in India (Bhattacherjee, 1999).

[6] It is the amended Trade Union Act 1926, and is in effect from January 2002.

[7] The rate of subscription by members of the trade union is also very low. 'Minimum rate of subscription by members of the trade union is fixed at one rupee per annum for rural workers, three rupees per annum for workers in other unorganized sectors and 12 rupees per annum in all other cases. For the promotion of civil and political interest of its members unions are authorized to set up separate political funds.' – Trade Unions (Amended) Act 2001.

[8] 'All office bearers of a registered trade union, except not more than one-third of the total number of office bearers or five, whichever is less, shall be persons actually engaged or employed in the establishment or industry with which the trade union is connected.' – Trade Unions (Amended) Act 2001.

Over all, in India, 34.13% of regular non-agricultural workers are trade union members. This percentage varies widely across states. In Mizoram it is as high as 91.28%, followed by 74.51% in Tripura. On the other hand, it is less than 25% in states like Uttar Pradesh (22.90%), Punjab (22.73%), Hariyana (22.60%) and Delhi (19.15%).[9]

3. Data and Variables

Data

Our analysis is based on data from various sources. Data on individual attributes and industrial characteristics come from the 61st round of the Employment and Unemployment Survey (EUS), carried out by the National Sample Survey Organisation (NSSO), Ministry of Statistics and Programme Implementation, Government of India, between July 2004 and June 2005. The purpose of this survey was to provide estimates of various characteristics pertaining to employment and unemployment in India. EUS, based on a stratified multi-stage design, is the only nationally representative survey in India that collects information on individual trade union membership. In this analysis, we use a sub-sample of workers: non-agricultural regular salaried/wage workers, based on usual principal activity status[10], in 27 states (Nagaland, Meghalaya, Manipur, Jammu & Kashmir, Rajasthan, Chhattisgarh, Jharkhand, Assam, Orissa, Madhya Pradesh, Uttar Pradesh, Bihar, Tamil Nadu, Karnataka, Andhra Pardesh, Tripura, Arunachal Pradesh, Sikkim, West Bengal, Mizoram, Goa, Haryana, Punjab, Maharastra, Himachal Pradesh, Kerala and Gujrat), union territory of Puducherry and the national capital territory of Delhi. That is, our sample covers all states and territories that have elected governments, except one state (Uttaranchal) for which required data on state-level variables are not available.[11]

To measure political activism and the reach of communist parties we use data from the Statistical Reports of General Election to the Legislative Assembly of various states, Election Commission of India, New Delhi, India. Unfortunately, data on individual's political affiliation is not available. Data on state-level unemployment rates comes from EUS. The

[9] Own calculations based on data from 2004-05 Employment and Unemployment Survey, NSSO, India.

[10] "The usual activity status relates to the activity status of a person during the reference period of 365 days preceding the date of survey. The activity status on which a person spent relatively longer time (i.e. major time criterion) during the 365 days preceding the date of survey is considered as the *usual principal activity status* of the person." (NSSO 2006)

[11] States and territories of our sample covers about 99% of India's population and employed workforce.

source of data on per capita Net State Domestic Product (NSDP) is the Central Statistical Organisation (CSO), Ministry of Statistics and Programme Implementation, Government of India, website as on 14-06-2008.

Dependent Variable

The dependent variable is an indicator variable taking value one if an individual is a trade union member, otherwise zero. We consider an individual to be a trade union member, if that individual responded positively to the question: "Are you a member of any union or association in your activity?"[12] Given the nature of this question, it seems to be logical to propose that unions represent collective organisations based on activities/trades of workers. Table 1 presents trade union membership in India during 2004-05. It is interesting to observe that union membership in states where communist parties have poor support base is much lower (by 11.48%) than that in states having moderate or high support base of communist parties. Descriptive statistics reveals that union membership in public sector is strikingly higher than that in private sector in India. It also indicates that union membership varies also across gender, occupation, establishment size, and industry.

[12] It was asked conditionally following a positive response to the question: "Is there any union or association in your activity?" Note that it concerns to union in 'activity/trade'; not in the 'work place' as in GHS or BHPS in Britain (Green 1990, Chrysanthou 2007). It seems to be reasonable to assume in the present context that individuals are likely to have freely exercised their preferences for their work activity. So, we choose to analyse individual union membership choice independently of whether or not there is a union in individual's activity. Our results remain valid, if we estimate an appropriate conditional probit model (bivariate probit model), as in Green (1990), see Appendix 1.

Table 1: Trade Union Membership in India, 2004-2005

	Union Membership (Percent)
Reach of communist parties	
Communist vote – Very Low or Low	32.81
Communist vote – Moderate or High	44.29
Gender	
Male	35.13
Female	30.07
Occupation	
Clerical and related worker	55.32
Administrator & manager	46.03
Professional and technical	52.37
Production and related worker	28.98
Other manual worker	25.70
Service worker	20.93
Sales worker	7.00
Establishment Size	
More than 20	55.63
Between 10 to 20	35.97
Less than 10	17.90
Sector	
Public sector	75.01
Private sector	15.48
Industry	
Mining	78.87
Services	37.17
Manufacturing	23.26
Overall	34.13

Explanatory Variables

The variables affecting the individual decision to unionise can be classified broadly into three categories, namely, state-level factors, personal attributes and industrial characteristics, as indicated in Table 2. Definitions of explanatory variables are detailed in Appendix 2. Table 3 presents the descriptive statistics of variables used in this analysis.

Table 2: Variables affecting the individual decision to unionise

State-level variables	**Individual-level variables**	
	Personal attributes	**Industrial characteristics**
Reach of communist parties Political activism Unemployment rate Per capita NSDP	Gender Marital status Social-group Religion Education Labour market experience Employment status Occupation	Establishment size Sector – public or private Type of industry

The individual-level data are linked to state-level measures of the reach of communist parties, political activism, labour market situation, and per capita net state domestic product (NSDP). We consider the percentage of votes polled in favour of communist parties' candidates in state legislative assembly elections held by 2004 as a measure of the reach of communist parties across states[13], and use that as an explanatory variable. Since communist parties are widely known for their grass-root level organisations and active role in mobilising the working class in India, mere existence of communist parties in a state might also create/influence socio-political environment in favour of unionisation, irrespective of whether they have strong hold in a state or not. Need less to say, degree of strength of communist parties likely to have differential impact on individuals' propensity to unionise. In order to delineate such effects clearly, we categorise states according to the percentage of votes polled in favour of communist parties and use *Communists' Vote – Very Low, Communists' Vote – Low,* and *Communists' Vote – Moderate or High* dummies in separate regression. See Appendix 2 for estimates of the reach of communist parties in various states in India. We use voter turnout as a measure of state-level political activism. It is expected that larger size of politically active population in a state will lead to higher union density. Another important factor is the labour market situation in a state, which is likely to have consequences on individual decision to unionise. Higher unemployment rate creates more uncertainty in job search and future earnings in case of layoff. Therefore, 'insiders' are likely to have higher propensity to unionise in sates with higher unemployment rate in order to protect their job. Hence, state-level unemployment rate control is included in the union membership model. In order to control for possible effects of standard of living in a state, we use dummy variables, *Per Capita NSDP – Medium* and *Per Capita NSDP – High*, in the analysis.

It is generally argued that females are less likely to unionise due to their discontinuous labour market participation. Descriptive statistics indicate that unionisation among female workers is less (by 5%) than their male counterpart in India (see Table 1). In fact, female participation in the labour market is also low in India: only about 20% of regular non-agricultural workers are female. Singles are also are expected to be less inclined to join union compared to married workers, due to their lower level of family commitments. In 'exit voice' scenario, individuals

[13] Clearly, this measure is more appropriate and reliable compared to possible alternative measures based on political parties' membership data.

with higher level of family commitments are likely to seek greater job security (Booth 1986). So, we include marital status variable in the analysis.

Table 3: Descriptive Statistics of Variables

Variables	Mean	Std. Dev.	Min	Max
Trade Union Membership	0.341	0.474	0	1
Communist Vote (%)	6.951	14.135	0	49.18
Communist Vote – Very Low	0.853	0.354	0	1
Communist Vote – Low	0.031	0.172	0	1
Communist Vote – Moderate or High	0.115	0.319	0	1
Voter Turnout (%)	66.225	7.732	43.70	90.21
Unemployment Rate (per thousand)	32.385	32.160	7.54	166.50
Per Capita NSDP – Medium	0.338	0.473	0	1
Per Capita NSDP – High	0.400	0.490	0	1
Male	0.802	0.398	0	1
Single	0.246	0.431	0	1
Reserved Category – Scheduled Castes and Tribes (SCST)	0.211	0.408	0	1
Reserved Category – Other Backward Class (OBC)	0.361	0.480	0	1
Minority	0.165	0.371	0	1
General Education – Middle	0.177	0.382	0	1
General Education – Secondary	0.152	0.359	0	1
General Education – Higher Secondary	0.162	0.368	0	1
General Education – Graduate	0.159	0.366	0	1
General Education – Post Graduate and above	0.061	0.240	0	1
Technical Education – Diploma	0.066	0.249	0	1
Technical Education – Graduate and above	0.047	0.211	0	1
Vocational Training	0.072	0.258	0	1
Work Experience	25.736	12.770	0	92
Full-Time Employment	0.988	0.110	0	1
Occupation – Professional and Technical	0.198	0.398	0	1
Occupation – Clerical	0.170	0.375	0	1
Occupation – Sales worker	0.093	0.291	0	1
Occupation – Service worker	0.152	0.359	0	1
Occupation – Production and related worker	0.353	0.478	0	1
Occupation – Other manual worker	0.004	0.066	0	1
Establishment Size (0, 1, 2 categorical)	0.866	0.925	0	2
Public Sector	0.313	0.464	0	1
Industry – Mining	0.012	0.111	0	1
Industry – Manufacturing	0.256	0.436	0	1
Number of observations	33092			

Individuals from socially disadvantageous communities or minority-religion groups are expected to have a higher propensity to unionise in order to get protection against unfair discrimination. In India, socially disadvantageous communities are identified based on castes. These are scheduled castes (SC), scheduled tribes (ST), and other backward class (OBC). Out

of these three groups, SC and ST are considered to be in more disadvantageous position compared to OBC. Government's affirmative policies to uplift socio-economic condition of SC and ST communities also differ from that of OBC. So, we use two dummy variables, *Scheduled Castes and Tribes (SCST)* and *Other Backward Class (OBC)*, in order to assess the impact of social-class. We also include *Minority- religion* variable in order to control for possible impact of being a member of minority-religion group.

The level as well as the nature of education attained by an individual may also affect individual's propensity towards unionisation. Educated workers may expect higher human capital premium through individual action compared to that in the unionised sector due to standardisation of wage rate via bargaining (Abowd and Farber, 1982). On the other hand, more educated workers may value collective action more due to their potential ability to influence union's action (Booth, 1986). The EUS contains detailed information on each individual's level of educational attainment as well as nature of education (general, technical, vocational), for which we use three sets of dummy variables.

In order to asses the impact of individual's labour market experience, we include the variable *Work Experience* and its square in the union membership model. Since there was no direct information on labour market experience in the EUS, we measure it by subtracting education leaving age from the present age of an individual. Though this measure might overestimate individuals' labour market experience due to possible discontinuity in the labour market participation (Booth, 1986), this is the only alternative one can possibly consider in the present context. Employment status might also affect an individual's propensity to unionise. It is argued that part-time workers are less inclined to unionise due to their less stable employment conditions and discontinuous participation in the labour force (Booth, 1986). We use *Full-Time Employment* dummy variable to assess the impact of employment status. We also use occupational dummies to control for impacts of occupational attributes. Based on National Occupational Classification (NCO) – 1968, we form six major occupational groups.

Finally, to estimate the impact of industrial characteristics on individual decision to unionise, we include the categorical variable *Establishment Size*, sector specific dummy variable *Public Sector*, and industry specific dummy variables *Mining* and *Manufacturing* in the trade union membership model. It is generally argued that establishment size positively affects union density (see Hirsch and Addison, 1986 for a review). However, the positive relation between

establishment size and union density might get reversed, if large establishments act strategically, e.g., setting higher wages, to avoid unionisation (Brown and Medoff, 1989). Booth (1986) argues that establishment size and type of industry affects union membership via their impact on organisation costs. Such organisation cost is expected to decline with establishment size, labour immobility, and government recognition. Descriptive statistics shows that union membership increase from 17.9% in establishments with less than 10 workers to 55.63% in establishments with more than 20 workers (see Table 1). Out of three groups of industries considered in this analysis, mining is found to be most heavily unionised industry, where more than 78% workers are member of trade union. Similar high rate of unionisation is also present in public sector establishments.

4. Estimation Methodology

The reduced form model depicting the individual decision to unionise or not can be written as follows.

$$Y_i^* = \alpha + X_i^{/}\beta + u_i, \quad i = 1, 2, \ldots, N \qquad (1)$$

$$Y_i = I(Y_i^* > 0)$$

$$F(u_i) = \frac{e^{u_i}}{1+e^{u_i}}$$

The net benefits of an individual *i* from joining trade union are captured by the latent variable Y_i^*, and the union membership status of an individual *i* is indicated by the dummy variable Y_i. $F(u_i)$ is the cumulative distribution function (CDF) of the error term u_i, which has logistic distribution. X_i is the vector of exogenous explanatory variables (state-level variables, personal attributes and industrial characteristics), α is the constant term, and β is the vector of unknown parameters to be estimated. Clearly, the probability of an individual *i* to join union is $p_i = E(Y=1 \mid X_i) = \frac{e^{\alpha+X_i^{/}\beta}}{1+e^{\alpha+X_i^{/}\beta}}$. We estimate this model, using different set of explanatory variables as shown in Table 4, by maximum likelihood method with robust standard errors, and compute marginal effects of explanatory variables, $\frac{\partial p_i}{\partial x_j} = \frac{e^{\alpha+X_i^{/}\beta}}{1+e^{\alpha+X_i^{/}\beta}}\beta_j$,

j = 1, 2, …, K for continuous variables, and discrete change for dummy variables from zero to one.[14]

We first estimate the above union membership model with *Communists' Vote(%)* as an explanatory variable to examine the impact of communist parties on individual decision to unionise. Next, we drop this level variable and include *Communists' Vote – Very Low, Communists' Vote – Low,* and *Communists' Vote – Moderate or High* dummies in order to examine whether mere existence of communist parties in a state also has any significant impact or not. It also helps us to tackle possible problem due to lopsided distribution of the level variable *Communists' Vote(%)*. Then, we include an additional control for state-level labour market situation, *Unemployment Rate,* and omit *Other Backward Class (OBC)* and *Minority-religion* because of their highly insignificant coefficients, in the final regression.[15] We find that the results obtained from alternative specifications of the model are very similar (see Table 4). Based on the results obtained from the final regression, as reported in the last two columns of Table 4, we calculate predicted probabilities of union membership for different categories of individuals under alternative scenario.

We do not include individual's wage in the union membership model, because in India collective bargaining agreements apply to all workers covered by a particular agreement irrespective of their individual union status, as in all 'open shop' contexts. Therefore, it seems that wage rate will not be an important variable in the present context, unlike as in 'closed shop' contexts. This is generally referred as 'free rider' problem in the literature associated with the trade union membership decision in 'open shop' contexts. Moreover, estimating a single equation model with wage rate as an explanatory variable might lead to the problem of endogeneity.[16] Nonetheless, we carry out a separate set of regression including individual's earnings as an explanatory variable as in Booth (1986), see Appendix 1. We find that our main results go through, if we consider such alternative specification of the model.

[14]As indicated by the methodology of the survey (EUS), we have used sampling weights to compute descriptive statistics and to estimate the model.

[15]High union density may contribute to unemployment rate, due to high bargained wage. However, that may lead to endogeneity problem, only if one attempts to estimate a model with union density as the dependent variable and unemployment rate as an explanatory variable. In the present context, the possibility of endogeneity problem is non existent; because an individual's decision to join union at the margin will not alter union's bargaining power and hence will not have any impact on variables like *Unemployment Rate*.

[16] Even if the relation between union status and wage rate is not simultaneous, the coefficient of wage rate may be biased because wage rate might capture effects of some omitted variables that are simultaneous (Booth 1986). Estimation of an appropriate simultaneous equation model (SEM) might solve such problem, which is beyond the scope of this paper.

It is often argued that to asses the impact of contexts, it is appropriate to estimate a hierarchical model (see Luke 2004 and Raudenbush and Bryk 2002 for details). In order to check robustness of our results, we also estimate a hierarchical generalised linear logit model, as in Martin and Brady (2007), a particular specification of the commonly known generalised linear latent and mixed models (GLLAMM). We also estimate a conditional probit model to check whether our results change, if we estimate individual's probability to join union conditional on union availability (as in Green, 1990). We report results of these two sets of estimates also in Appendix 1. These estimates confirm that our results are robust to alternative method of estimation.

5. Results

This section presents the estimates of the impact of state-level variables, personal attributes and industrial characteristics on individual's propensity to unionise. Estimates of marginal effects are shown in Table 4, together with p-values.

The econometric analysis shows that the reach of communist parties has positive and significant impact on individual's propensity to unionise. Marginal effect of *Communists' Vote (%)* is positive and significant. More interestingly, it also shows that existence of communist parties in a state positively affects the probability to unionise even if the support base of communist parties is low. Marginal effects of both *Communist Vote – Very Low* and *Communist Vote – Low* are also positive and significant. It indicates that mere existence of communist parties in a state also seems to be effective in facilitating trade unions to some extent. We also find that the unionisation probability increases with an increase in state-level political activism, marginal effect of the variable *Voter Turnout* is positive and significant. It demonstrates that the degree of political activism plays important role in influencing individual decision to unionise. These are notable findings of this paper.

We find that, other than political factors, labour market situation in a state also plays important role in shaping the context of unionisation. Table 4 shows that marginal effect of *Unemployment Rate* is positive and significant. It supports the hypothesis that higher unemployment rate leads to higher level of uncertainty of future earnings and that in turn makes an individual more inclined towards unionisation to protect his or her job.

Now consider the personal attributes of individuals. The estimated marginal effect of *Work Experience* variable is positive and significant, but its square term has negative effect. It implies that individual's propensity towards unionisation increases, at a decreasing rate, with his or her work experience. It seems that individuals at their old age appreciate the value of union more and hence are more inclined towards unionisation than relatively young individuals.[17] Similar effect is also present in case of individuals with more family commitments (marginal effect of the dummy *Single* is negative and significant). This result is in sharp contrast to the findings of Booth (1986) in case of Britain. Table 4 also shows that gender, captured by *Male* dummy, and employment status, captured by *Full-Time Employment* dummy, have significant impact on individual's decision to unionise. It supports the commonly held view that discontinuous participation in the labour force and less stable employment conditions induce an individual to be less inclined towards unionisation. Lower probability for females to join union might also be due to less number of females in activity or work place; only 20% of the regular non-agricultural workers are females in India. Social norms and customs might also discourage females from being union member. Ethnic background and occupation also influence individual's propensity to unionise. We find that marginal effect of the dummy *SCST* is positive and significant; but, *OBC* and *Minority-religion* dummies are not significant. Relatively more disadvantageous background of SCs and STs, compared to OBCs, in India seems to have propelled them to get more united in order to protect themselves from labour market discriminations. It also indicates that, in India, as far as trade union membership is concerned, the degree of backwardness of individual's social-group matters, not his or her religion. Further, we find that level of general education, which is non-technical, has positive and significant effect on individual decision to unionise. Technical diploma holders are also seems to appreciate the value of union more than individuals who do not have any technical education. Only technical degree and vocational training has negative, but insignificant, impact on individual's propensity to unionise. It implies that both the level and the type of education together influence individual decision to unionise. Note that in case of Britain education is found to have no impact on individual's propensity to unionise (Booth, 1986). Therefore, the argument that individual's with higher level of educational attainment are likely to value trade unions less seems to be inapt in case of India. Rather this finding provides some support to the argument that more

[17] We note that Gani (1996) also analyses effects of personal attributes on individual decision to unionise using data from India and finds similar result. However, that analysis is based on a very narrow data set collected from five selective firms and focus only on individual characteristics, no attempt has been made to assess the context of unionisation and impact of industrial characteristics.

educated individuals might appreciate the value of union more because of their potential ability to influence union's functioning.

Table 4: Logit Analysis of Trade Union Membership in India

Independent Variables	(1)		(2)		(3)	
	M. E.	**p values**	**M. E.**	**p values**	**M. E.**	**p values**
State–level factors						
Communists' Vote (%)	0.0020	0.000				
Communists' Vote, dummy (Ref: Nil)						
Very Low			0.0756	0.006	0.0873	**0.001**
Low			0.2773	0.000	0.2869	**0.000**
Moderate or High			0.1747	0.000	0.1026	**0.013**
Voter Turnout (%)	0.0023	0.012	0.0035	0.000	0.0032	**0.001**
Unemployment Rate (per thousand)					0.0011	**0.000**
Per Capita NSDP, dummy (Ref: Low)						
Medium	0.0132	0.354	0.0265	0.073	0.0437	**0.004**
High	0.0230	0.098	0.0360	0.014	0.0226	0.128
Personal attributes						
Male, dummy	0.0487	0.000	0.0497	0.000	0.0553	**0.000**
Single, dummy	-0.0688	0.000	-0.0694	0.000	-0.0722	**0.000**
Reserved Category, dummy (Ref: General)						
Scheduled Castes and Tribes (SCST)	0.0395	0.005	0.0374	0.008	0.0387	**0.002**
Other Backward Class (OBC)	0.0048	0.696	0.0003	0.983		
Minority-religion, dummy (Ref: Hindu)	0.0007	0.959	0.0005	0.972		
General Education, dummy (Ref: Below Middle)						
Middle	0.1081	0.000	0.1061	0.000	0.1032	**0.000**
Secondary	0.1102	0.000	0.1054	0.000	0.1008	**0.000**
Higher Secondary	0.1741	0.000	0.1733	0.000	0.1720	**0.000**
Graduate	0.2342	0.000	0.2310	0.000	0.2287	**0.000**
Post Graduate and Above	0.2287	0.000	0.2285	0.000	0.2241	**0.000**
Technical Education, dummy (Ref: Nil)						
Diploma	0.0850	0.001	0.0814	0.001	0.0730	**0.003**
Graduate and Above	-0.0015	0.954	-0.0035	0.891	-0.0057	0.824
Vocational Training, dummy	-0.0214	0.419	-0.0204	0.442	-0.0213	0.425
Work Experience (Yrs.)	0.0194	0.000	0.0193	0.000	0.0192	**0.000**
Square of Work Experience	-0.0002	0.000	-0.0002	0.000	-0.0002	**0.000**
Full-Time Employment, dummy	0.1648	0.000	0.1648	0.000	0.1623	**0.000**
Occupation, dummy(Ref :Administrator & Manager)						
Professional and Technical	0.1542	0.000	0.1575	0.000	0.1614	**0.000**
Clerical	0.1134	0.000	0.1193	0.002	0.1208	**0.002**
Sales worker	-0.0410	0.269	-0.0383	0.294	-0.0374	0.309
Service worker	-0.0620	0.056	-0.0582	0.068	-0.0569	**0.077**
Production and related worker	0.1094	0.003	0.1121	0.002	0.1129	**0.002**
Other manual worker	-0.0479	0.562	-0.0468	0.575	-0.0500	0.538
Industrial characteristics						
Establishment Size (0, 1, 2 categorical)	0.1134	0.000	0.1131	0.000	0.1137	**0.000**
Public Sector, dummy	0.4647	0.000	0.4664	0.000	0.4672	**0.000**
Industry, dummy (Ref: Service)						
Mining	0.2208	0.002	0.2155	0.000	0.2171	**0.002**
Manufacturing	0.0066	0.672	0.0092	0.560	0.0138	0.382
Number of observations	33090		33090		33092	
Log pseudo-likelihood	-13433.149		-13399.325		-13369.913	
Overall significance	$\chi^2(30)=3415.45$, Prob > χ^2 = 0.00		$\chi^2(32)=3466.91$, Prob > χ^2 = 0.00		$\chi^2(31)=3433.96$, Prob > χ^2 = 0.000	
Pseudo R-square	0.3676		0.3691		0.3706	

Finally, we also find that the occupation of an individual plays some role in his or her decision to unionise. Table 4 indicates that production and related workers, clerks, professionals and technicians are more probable, and service workers are less probable to join union compared to administrators and managers. Therefore, it seems that there is no clear distinction between 'blue collar' and 'white collar' workers in terms of their propensity to join activity-based unions in India.

Considering industrial characteristics, we find that the establishment size has positive and significant impact on individual's decision to unionise. It supports the view that the larger establishments offer greater scope for unionisation due to more peer pressure to unionise and/or possible higher market power leading to higher rents to be bargained over. In effect, this finding refutes the view that larger establishments avoid unionisation by setting strategically higher wages. We also find that the *Public Sector* dummy has very high and significant marginal effect. It supports commonly held view that public sector workers are more likely to unionise compared to private sector workers. Out of three broad types of industry, services, mining, and manufacturing, we find that, individuals are most likely to join union in mining industry.

5.1 Predicted Probabilities

To illustrate the size of the effects of some of the factors as discussed above, we present the predicted probabilities of union membership for an arbitrarily defined archetypical 'basic worker' in Table 5. This basic worker is a full-time general-category Hindu married female, with five years work-experience, employed in private sector as a production and related worker. She is a graduate of general stream and does not have any technical or vocational training. There are more than 20 workers in her workplace. She lives in a state in which per capita NSDP is at medium level, unemployment rate and electoral turnout are at national average level, and communist parties do not have any support base. Each row of Table 5 corresponds to the predicted probability that derives from altering one of the characteristics of basic worker. Predicted probabilities of a basic worker in manufacturing industry and mining industry are presented in separate columns.

Table 5: Predicted Probabilities (Percent) of Union Membership

	Manufacturing		Mining	
	Probability (%)	**Difference (Ref: Basic)**	**Probability (%)**	**Difference (Ref: Basic)**
Basic	11.68		24.21	
Communists' Vote (Moderate or High)	17.72	6.04	34.22	10.01
Male	15.11	3.43	30.06	5.86
SCST	13.83	2.15	27.94	3.73
Public Sector	54.48	42.80	74.29	50.09
20 Years Experience	27.79	16.11	48.16	23.96

With all other characteristics held constant, if we change the basic worker's state from, say, Arunachal Pradesh (no vote for communists) to West Bengal (high support base of communist parties), her predicted probability of being unionist increases from 11.68% to 17.72% (manufacturing industry) or from 24.21% to 34.22% (mining industry). Therefore, the reach of communist parties has sizeable predicted effect. Compared to it, the predicted effect of being male or belonging to scheduled castes or scheduled tribes category is quite small in both manufacturing and mining industries. More dramatic is the rise in individual's propensity to unionise deriving from being in public sector or being more experienced. If a basic worker's experience increases from 5 years to 15 years, with all other characteristics held constant, her probability of being unionist increases by 16.11% (manufacturing industry) or 23.96% (mining industry). If we change the basic worker's sector of employment from private to public, the probability to unionise increases by 42.80% (manufacturing industry) or 50.09% (mining industry) in an otherwise identical situation.

Table 6: Stage-by-Stage Changes in Predicted Probabilities (Percent)

	Manufacturing		Mining	
	Probability (%)	**Difference (Ref: Basic)**	**Probability (%)**	**Difference (Ref: Basic)**
Basic	11.68		24.21	
Communists' Vote (Moderate or High)	17.72	6.04	34.22	10.01
Communists' Vote (Moderate or High) / Public Sector	66.09	54.41	82.48	58.27
Communists' Vote (Moderate or High) / Public Sector / 20 Years Experience	85.01	73.33	93.19	68.99
Communists' Vote (Moderate or High) / Public Sector / 20 Years Experience / SCST	87.32	75.63	94.33	70.12
Communists' Vote (Moderate or High) / Public Sector / 20 Years Experience / SCST / Male	90.26	78.58	95.72	71.52

To illustrate further, the basic worker is now to be transformed incrementally into a worker who lives in a state in which communist parties have moderate or high support base, works in public sector, has 20 years of experience and belongs to scheduled castes or scheduled tribe category, and is male, all other characteristics held constant. This transformation alters the probability of being unionist, as shown in Table 6. Note that the completely transformed basic worker's probability to join union is more than 90%.

6. Concluding Remarks

This paper provides estimates of the impact of political factors, along with the impact of personal attributes and industrial characteristics, on individual decision to unionise in India using the representative survey data. Contribution of this paper is twofold. First, it quantifies the effects of the reach of communist parties and the degree of political activism at sub-national level on individual's decision to unionise. Second, it provides empirical evidence of individual's propensity towards unionisation in a developing country using a representative data set.

We find that the reach of communist parties has sizeable predicted effect on individual's propensity to unionise. Further, we find that it is not necessary to have large support base, mere existence of communist parties in a state also facilitates unionisation significantly. We also find that both political activism and unemployment rate have positive and significant impact on individual's propensity to be unionist.

Econometric analysis reveals that full-time male worker's probability to join union is higher than part-time and/or female workers. It indicates that increasing casualisation of workforce in India in the post-liberalisation period (Bhaumik, 2003) seems to have adverse impact on unionisation.[18] This paper documents that individuals from scheduled castes or scheduled tribe categories are more inclined to unions compared to general category individuals. However, minority religion and other backward castes were found to have no relationship to the unionisation probability. It indicates that the differential affirmative policy together with the degree of social backwardness might have contributed to some extent in shaping individual decision to unionise. Econometric analysis also indicates that individual's propensity to unionise increases considerably at the verge of his or her retirement, which

[18] Union membership has declined by 12% in India during 1987 to 2001. (Source: various issues of Indian Labour Statistics, Labour Bureau, Shimla.)

might have some implications to social security policies in India. We also find that, except technical degree and vocational training, individual's educational attainment positively affects his or her probability to be unionist. Occupation of individual and industrial characteristics also play important role in influencing individual decision to unionise. Very high impact of public sector on the probability of union membership seems to indicate that the nature of workplace environment plays very crucial role in facilitating trade unions.

It might be more appropriate to study individual decision to unionise in a dynamic context, since cross-section estimates may be biased due to unobservable individual specific effects. That will also help to understand the relation between changes in the pattern of trade union membership and changes in political factors and macroeconomic policies over time. Unfortunately, required data for such analysis in Indian context is not available. Nonetheless, this paper provides some new insights to understand the issue of trade union membership, particularly in the context of developing countries like India, and can possibly be considered as a base paper for future research that aims to analyse trade union membership at sub-national level.

Appendix 1: Robustness Analysis

Independent Variables	Conditional Probit		GLLAMM		Logit analysis including Earnings	
	Coeff.	p values	Coeff.	p values	Coeff.	p values
State–level factors						
Communists' Vote, dummy (Ref: Nil)						
Very Low	0.1955	0.029	0.5095	0.000	0.5945	0.000
Low	0.6340	0.000	1.1549	0.000	1.2653	0.000
Moderate or High	0.1949	0.051	0.6568	0.000	0.5606	0.004
Voter Turnout (%)	0.0089	0.001	0.0109	0.000	0.0195	0.000
Unemployment Rate (per thousand)	0.0036	0.000	0.0065	0.000	0.0059	0.000
Per Capita NSDP, dummy (Ref: Low)						
Medium	0.1240	0.003	0.2013	0.005	0.1834	0.021
High	0.0613	0.140	0.1053	0.067	0.0579	0.455
Personal attributes						
Earnings					0.0003	0.000
Male, dummy	0.2261	0.000	0.3024	0.000	0.1975	0.004
Single, dummy	-0.1586	0.000	-0.3935	0.000	-0.4115	0.000
Reserved Category, dummy (Ref: General)						
Scheduled Castes and Tribes (SCST)	0.0235	0.116	0.1960	0.002	0.2272	0.000
General Education, dummy (Ref: Below Middle)						
Middle	0.0313	0.259	0.4548	0.000	0.4280	0.000
Secondary	0.0877	0.000	0.4695	0.000	0.3694	0.000
Higher Secondary	0.0828	0.006	0.7795	0.000	0.6529	0.000
Graduate	0.1169	0.000	1.0557	0.000	0.7660	0.000
Post Graduate and Above	0.1066	0.005	1.1031	0.000	0.6365	0.000
Technical Education, dummy (Ref: Nil)						
Diploma	0.0146	0.632	0.2118	0.061	0.2335	0.044
Graduate and Above	-0.0051	0.889	-0.0238	0.878	-0.3571	0.023
Vocational Training, dummy	-0.0988	0.118	-0.1421	0.206	-0.0389	0.784
Work Experience (Yrs.)	0.0127	0.000	0.1010	0.000	0.0821	0.000
Square of Work Experience	-0.0002	0.003	-0.0011	0.000	-0.0009	0.000
Full-Time Employment, dummy	0.6353	0.000	1.1497	0.000	0.9606	0.004
Occupation, dummy(Ref :Administrator & Manager)						
Professional and Technical	0.3046	0.001	0.7425	0.000	1.2830	0.000
Clerical	0.1981	0.038	0.5823		1.1673	0.000
Sales worker	-0.2928	0.006	-0.1710	0.466	0.3542	0.170
Service worker	-0.3433	0.001	-0.2919	0.075	0.3285	0.179
Production and related worker	0.1102	0.254	0.6074	0.000	1.1770	0.000
Other manual worker	-0.3454	0.231	-0.0946	0.789	0.3808	0.449
Industrial characteristics						
Establishment Size (0, 1, 2 categorical)	0.3701	0.000	0.6051	0.000	0.5242	0.000
Public Sector, dummy	1.4490	0.000	2.2202	0.000	2.1166	0.000
Industry, dummy (Ref: Service)						
Mining	0.5077	0.001	0.8282	0.023	0.8317	0.005
Manufacturing	0.0028	0.950	0.0983	0.245	0.0688	0.397
Constant	-3.4230	0.000	-7.7609	0.000	-8.4252	0.000
	No. of obs. 33092		No. of Level 1 units 33092, No. of Level 2 units 29		No. of obs. 32120. Pseudo R-square = 0.3706	
	Log pseudolikelihood = -26805376		Log likelihood = -18146849		Log pseudo-likelihood = -12794.074	
Overall significance	Prob > chi2 = 0.000		Prob > chi2 = 0.000		Prob > chi2 = 0.000	

Notes: (1) In conditional probit model NSDP dummies, dummies for communists' vote, *Voter Turnout*, *Unemployment Rate*, *Full-Time Employment*, *Male*, occupation dummies, *Establishment Size*, *Public Sector*, and industry dummies have been used to estimate the union-existence equation. (2) In GLLAMM model, we consider personal attributes and industrial characteristics as level-1 variables, and state-level variables as level-2 variables. We consider that level-2 variables affect the individual decision to unionise directly, as in Martin and Brady (2007). (3) The variable *Earnings* is defined as the individual's wage or salary earnings per week. Estimation of logit model including the *Earnings* variable suffers from the endogeneity problem.

Appendix 2: The Data: Definitions and Sources

Variable	Definition
State-level factors	
Communists' Vote (%)	(Percentage of Communists' Votes)=100*(Number of votes polled in favour of candidates affiliated to communist parties in a State/UT in the state legislative election held by 2004)/(Total number of valid votes polled in that election) Based on agenda papers of parties and manifestoes released before the election, we have considered CPI, CPM, CPIML, FBL, RSP, RPI, RCPI, PDS, AIFB, KECB, and DRPP as communist/leftist political parties, and others as non-communist parties.
Communists' Vote (Ref: Nil) – *Very Low*	The variable *Communists' Vote – Very Low* takes value 1, if the percentage of communists' votes in a State/UT is greater than zero but less than 5; otherwise it takes value zero. In the following states communists' vote was less than 5%. Mizoram (0.03%), Meghalaya (0.06%), Sikkim (0.07%), Gujrat (0.2%), Delhi (0.24%), Goa (0.27%), Haryana 0.3%), Uttar Pradesh (0.56%), Karnataka (0.61%), Madhya Pradesh (0.67%), Himachal Pradesh (0.68%), Rajasthan (0.99%), Jammu & Kashmir (1.04%), Maharastra (1.49%), Chhattisgarh (1.51%), Orissa (1.8%), Punjab (2.55%), Assam (3.21%), Andhra Pardesh (3.56%), and Tamil Nadu (4.6%).
– *Low*	The variable *Communists' Vote – Low* takes value 1, if the percentage of communists' votes in a State/UT is greater than or equal to 5 but less than 10; otherwise it takes value zero. In the following states communists' vote was between 5% to 10%. Puducherry (5.09%), Bihar (5.21%), Manipur (8.36%), and Jharkhand (8.31%).
– *Moderate or High*	The variable *Communists' Vote – Moderate or High* takes value 1, if the percentage of communists' votes in a State/UT is greater than 10; otherwise it takes value zero. In fact, in none of the states communists' vote was greater than 10% but less than 40%. Communist parties got more that 40% in each of the three states, which belong to this category, Kerala (40.6%), West Bengal (48.7%), and Tripura (49.18%). In Arunachal Pradesh and Nagaland communists' vote was 0%, which constitutes the base category. Source: Statistical Reports of General Election to the Legislative Assembly of various States/Union Territories, Election Commission of India, New Delhi.
Voter Turnout (%)	Percentage of total votes polled in a State/UT in the legislative election held by 2004. Source: Statistical Reports of General Election to the Legislative Assembly of various States/Union Territories, Election Commission of India, New Delhi
Unemployment Rate (per thousand)	Number of individual unemployed per 1000 individuals in the labour force, according to usual principal activity status, in a State/UT. (Source: EUS)
Per Capita NSDP – *Medium*	The variable *Per Capita NSDP – Medium* takes value 1, if per capita NSDP at factor cost at constant prices (base: 1999-2000) in a State/UT is more than Rs. 18147 but less than or equal to Rs. 22835 (i.e., between 40 to 70 percentile); 0

	otherwise. In Tamil Nadu, Karnataka, Andhra Pardesh, Tripura, Arunachal Pradesh, Sikkim, West Bengal and Mizoram per capita NSDP was medium.
– *High*	The variable *Per Capita NSDP – High* takes value 1, if per capita NSDP in a State/UT is more than Rs. 22835 (i.e., above 70 percentile); 0 otherwise. Delhi, Goa, Puducherry, Haryana, Punjab, Maharastra, Himachal Pradesh, Kerala and Gujrat belong to the category of high per capita NSDP. Nagaland, Meghalaya, Manipur, Jammu & Kashmir, Rajasthan, Chhattisgarh, Jharkhand, Assam, Orissa, Madhya Pradesh, Uttar Pradesh and Bihar belong to the category of low (i.e., below 40 percentile) per capita NSDP. Source: Central Statistical Organisation (CSO), India, website as on 14-06-2008.
Individual attributes	
Male	It takes value 1, if the individual is male; otherwise zero. (Source: EUS)
Single	It takes value 1, if the individual is not married; otherwise zero. (Source: EUS)
Reserved Category – *Scheduled Castes and Tribes (SCST)* – *Other Backward Class (OBC)*	It takes value 1, if the individual belongs to Scheduled Caste or Scheduled Tribe category, otherwise zero. It takes value 1, if the individual belongs to Other Backward Class category; otherwise zero. (Source: EUS)
Minority-religion (ref: Hindu)	It takes value 1, if the individual's religion is not Hindu; otherwise zero. (Source: EUS)
General Education (Ref: Below Middle) – *Middle* – *Secondary* – *Higher Secondary* – *Graduate*	It takes value 1, if the individual's highest education (general stream) is of middle standard; otherwise zero. It takes value 1, if the individual's highest education (general stream) is of secondary standard; otherwise zero. It takes value 1, if the individual's highest education (general stream) is of higher secondary standard; otherwise zero. It takes value 1, if the individual's highest education (general stream) is of graduation standard; otherwise zero.
– *Post Graduate and above*	It takes value 1, if the individual is highest education (general stream) is of post-graduation standard or above; otherwise zero. (Source: EUS)
Technical Education (Ref: Nil) – *Diploma* – *Graduate and above*	It takes value 1, if the individual has a Diploma in technical education; otherwise zero. It takes value 1, if the individual has a Graduate or above degree in technical education; otherwise zero (Source: EUS)

Vocational Training	It takes value 1, if the individual has received vocational training; otherwise zero (Source: EUS)
Work Experience (Yrs.)	Individual's number of years in the labour market. It is calculated as (Actual age of the individual minus his or her education leaving age). (Source: EUS)
Full-Time Employment	It takes value 1, if the individual is a full-time employee; otherwise zero. (Source: EUS)
Occupation (Ref: Administrator & Manager)	Administrative, Executive & Managerial category (NCO-68 1-digit: 2) is the reference.
– *Professional and Technical*	It takes value 1, if the individual's occupation falls in the category of Professional, Technical and Related Workers (NCO-68 1-digit: 0 and 1); otherwise zero.
– *Clerical*	It takes value 1, if the individual's occupation falls in the category of Clerical and Related Workers (NCO-68 1-digit: 3); otherwise zero.
– *Sales worker*	It takes value 1, if the individual is a Sales Worker (NCO-68 1-digit: 4); otherwise zero.
– *Service worker*	It takes value 1, if the individual is a Service Worker (NCO-68 1-digit: 5); otherwise zero.
– *Production and related worker*	It takes value 1, if the individual's occupation falls in the category of Operators & Labourers (NCO-68 1-digit: 7, 8, and 9); otherwise zero.
– *Other manual worker*	It takes value 1, if the individual's occupation does not belong to any of the above categories (NCO-68 1-digit: 6); otherwise zero. (Source: EUS)
Industrial Characteristics	
Establishment Size (0, 1, 2 categorical)	*Establishment Size* is zero, if the number of workers in the establishment/enterprise is less than 10. *Establishment Size* is 1, if the number of workers in the establishment/enterprise is 10 and above but less than 20. *Establishment Size* is 2, if the number of workers in the establishment/enterprise is 20 and above. (Source: EUS)
Public Sector	It takes value 1, if the individual works in a public sector enterprise; otherwise zero. (Source: EUS)
Industry (Ref: Service)	Service industry (NIC-98 2-digit codes: 40 to 99) is the base category.
– *Mining*	It takes value 1, if the individual works in mining industry (NIC-98 2-digit codes: 10 to 14); otherwise zero.
– *Manufacturing*	It takes value 1, if the individual works in manufacturing industry (NIC-98 2-digit codes: 15 to 37); otherwise zero. (Source: EUS)

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