



Job Discrimination, Earning Inequality and Policy Action: An Empirical Study with Indian Data

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This study aims to quantify discrimination in getting jobs and earnings associated with employment in the labour market in India and analyse how much of inequality in employment and wage is due to differences in gender, caste, and religion during the high growth regime under neoliberal reform. In measuring discrimination, we use ex-ante approach of inequality of opportunity in which there is equality of opportunity in employment and earning if all individuals face the same set of opportunities regardless of their circumstances. We define employment discrimination as the lack of access to good quality job because of differences in gender, caste and religion. This study observes that job discrimination is significantly high in wage employment than in self-employment both in the rural and urban economy. While in wage employment job discrimination declined, in self-employment it increased. Discrimination against women has been increasing with the opening of new type of jobs which are primarily temporary in nature. Wage discrimination is highly associated with employment discrimination.

JEL Codes: D31, D63, J62

Keywords: Inequality of opportunity, job discrimination, earning discrimination, India

1. Introduction

This study aims to quantify discrimination in getting jobs and earnings associated with employment in the labour market in India and analyse how much of inequality in employment and wage is due to differences in gender, caste, and religion during the high growth regime under neoliberal reform. Discrimination of any outcome like education, employment, or earning occurs because of the differences in castes, religion, gender and other non-economic factors on which the persons concerned are not responsible. The concept of discrimination is closely related to inequality of opportunity or unfair inequality proposed first by John Roemer (1998) in the economic literature and extended further by Fleurbaey (2008). Discrimination of different dimensions is a serious cause of concern from the point of view of social justice and

equity, and a large number of theoretical and empirical contributions on this issue have exploded in the last couple of decades. Governments usually provide opportunities in education, health, nutrition, security, and basic infrastructure for all people, but all cannot avail these opportunities equally. Measuring discrimination in such basic services and ultimately in employment and earning is, therefore, essential for policy perspectives.

We measure discrimination in employment opportunities and in earnings of three different groups of workers, namely casual wage workers, self-employed workers and regular salaried workers, by considering gender, castes and religion as probable factors responsible for it. In this study discrimination is considered as a situation where all individuals are not treated equally: equally endowed individuals have not the equal chance to get equitable jobs and equal earnings in the labour market. Discrimination is ethically objectionable because it appears due to difference in some factors beyond individual control.

Historically, the Indian society is segregated by different social groups in terms of castes, religions and ethnic identities with heterogeneous characters, and substantial economic disparities have been observed on the basis of caste, religion, and ethnicity (Das (2019, 2019a, 2013, 2012, 2012a), Deshpande (2001), Government of India (2006), Kijima (2006), Gaiha et al. (2007), Gang et al., (2007), Desai and Kulkarni (2008), Sengupta and Das (2014)). Thus, it is important to examine the role of these social variables in explaining employment and earning discrimination among the working age people in India.

2. Measuring discrimination

To calculate discrimination index for employment and earning in Indian labour market, we partition the whole sample taken from 61st round employment and unemployment survey (EUS) of 2004-05 and periodic labour force survey (PLFS) of 2018-19 and 2019-20 into non-overlapping sub-samples on the basis of circumstances (C).

In our study, C includes gender, castes and religion:

$$C = (\textit{gender}, \textit{castes}, \textit{religion})$$

In gender, there are two sub groups: male (*M*) and female (*F*):

$$\textit{Gender} = (M, F)$$

In the survey data, the households are categories into four social groups: Scheduled Tribes (ST), Scheduled Castes (SC), other backward castes (OBC) and others (we treat them as upper castes (UC)):

Castes = (ST, SC, OBC, UC)

We have categorised the sample households into four major religions Hindu (H), Muslim (M), Buddhist (B) and others (Others) taken from religious groups in the survey data:

Religion = $(H, M, B, Others)$

Thus, we have 32 sub-groups t_k ($k = 1, 2, \dots, 32$) based on C which are mutually exclusive:

$t_1 = (M, ST, H), t_2 = (M, SC, H), t_3 = (M, OBC, H)$ etc.

The outcome variable in each sub group varies because of the variation in endowment factors like education and skill. By following Checchi and Peragine (2010), we calculate mean income from the distribution in each characteristic group, t_k , to form a counterfactual distribution. Inequality calculated from this counterfactual distribution is a measure of discrimination.

In schedule 10.4 of the survey, activity status is classified into 13 groups consisting mainly different forms of self-employment, wage employment and other activities outside the labour market. Persons who are either employed or unemployed during the reference period together constitute the 'labour force' and persons who are neither 'working' nor 'seeking or available for work' for various reasons during the reference period are considered to be 'out of labour force'. The persons under the second category are students, those engaged in domestic duties, rentiers, pensioners, recipients of remittances, and so on.

In measuring discrimination, we use ex-ante approach of inequality of opportunity in which there is equality of opportunity in employment and earning if all individuals face the same set of opportunities regardless of their circumstances. Discrimination is measured by applying parametric method very similar to the methodology developed in Wendelspiess and Soloaga (2014). We use Shapley decomposition method to find out the relative contribution of gender, castes and religion to total discrimination in employment and earning. The decomposition analysis is important given the historical division of Indian society into different caste and religious groups, with some groups enjoying better opportunities than the others just because of their social inheritance.

To analyse labour market discrimination in India we have used two outcome variables: job quality and earning. While the first variable is constructed as binary (1 for good quality job and 0 for others), the second one is continuous variable. The model used in this study uses female dummy, the caste dummies for STs, SCs and OBCs, and religion dummies for Hindus, Muslims and Christians as explanatory variables to find out the differential effects of gender, caste and religion on wage and non-wage earnings. Although the estimation of wage discrimination is straightforward, estimation of employment discrimination is a challenging job because employment type is a qualitative variable. Inequality index or discrimination index of a qualitative variable does not follow directly the Pigou-Dalton transfer principle. For this reason, we have used logit link function which transforms the binary dependent variable into a continuous variable within the range $(-\infty, \infty)$ that could be used to check the validity of Pigou-Dalton transfer principle for robustness of the discrimination index estimated in this study.

Good quality jobs for wage workers are those which are regular paid, job contact for longer period in occupation with higher level of skill. For self-employed, good job quality is defined as jobs for longer period in high skilled occupation. The survey data used in this study provide employment status as self-employment and wage employment. We have taken own account worker and employer within self-employment category, and regular paid jobs and casual wage employment in wage employment category. Type of job contract is available in the form of no written job contract, and written job contract for different time periods. Employment with written job contract for more than 3 years is treated as job for longer period. Occupation type is recorded in terms of three-digit National Code for Occupation (NCO 1968 in employment and unemployment survey for 2004-05, and NCO 2004 in PLFS 2018-19 and 2019-20). We have classified high skilled jobs are those for which one digit code for NCO is less than 5. We define a binary variable with its value equal to 1 for good quality job and 0 for others both in wage employment and self-employment by combining these given characteristics of employment type.

In employment and unemployment survey data for 2004-05, wage and salary earnings are available for wage workers along with their daily work intensity based on current weekly status of employment. Earning information is not available for self-employed in this employment and unemployment survey data, and we cannot find out earning discrimination for them in 2004-05. But, in PLFS wage information along with daily intensity of work in terms of number of hours worked during a day are available only for casual wage workers. For regular paid workers

and self-employed, earnings are available on monthly basis. Thus, by using PLFS data it is possible to find out the intensity of earning discrimination among self-employed along with discrimination among wage workers.

3. Employment discrimination in Indian labour market

We define employment discrimination as the lack of access to good quality job because of differences in gender, caste and religion. Let, for example, two persons with similar endowments in terms of education and other productive factors, but belong to different circumstance group in terms of gender, caste and religion. Now if one person with superior circumstance has access to good job, while the other person with the same endowment but inferior circumstance has no access to good job, the employment discrimination appears.

In estimating discrimination index in wage employment and self-employment we use a binary variable, taking its value of 1 for workers in good quality jobs as defined above and 0 otherwise, as dependent variable and a set of dummies for gender, castes and religion as circumstances. For binary dependent variables, we first estimate a probit model of the outcome variable on the set of circumstances by applying a simple algorithm in Stata software. After estimating the probit regression, we compute the predicted values. For binary variables, the actual outcome is dichotomous, while the conditional outcome (probability) is continuous. Theil's T index of the predicted value provides a point estimate of discrimination index of employment.

The point estimates of discrimination index for different employment types in different locations in different time points are shown in Table 1. The bootstrap standard error shown in parentheses indicates the robustness of estimation. The estimated index suggests that job discrimination is significantly high in wage employment than in self-employment both in the rural and urban economy. About one fifth of employment gap in wage employment appeared because of discrimination in 2019-20. The extent of job discrimination because of circumstance factors among self-employed workers was 12 per cent in rural areas and even less in the urban areas during this period. Job discrimination increased among wage workers in rural areas during the period between 2004-05 and 2019-20.

Table 1 Job discrimination index by type of employment: All India

	Rural			Urban		
	2004-05	2018-19	2019-20	2004-05	2018-19	2019-20
Wage employment	0.15 (0.000)	0.20 (0.001)	0.21 (0.001)	0.22 (0.001)	0.20 (0.002)	0.20 (0.002)
Self-employment	0.15 (0.002)	0.12 (0.003)	0.12 (0.003)	0.14 (0.002)	0.08 (0.003)	0.08 (0.003)
All workers	0.14 (0.001)	0.11 (0.002)	0.10 (0.001)	0.14 (0.003)	0.06 (0.003)	0.08 (0.003)

Note: Figures in parentheses indicate bootstrap standard error

Source: Authors' estimate by using household level survey data from EUS and PLFS

Table 2 provides results for Shapley decomposition of the estimated discrimination index for each type of employment in the rural and urban labour market in India. This decomposition is useful to understand the importance of each circumstance variable in explaining total discrimination in employment. Gender discrimination among all workers is higher in rural areas than in urban areas. This part of discrimination increased between 2004-05 and 2018-19, but declined between 2018-19 and 2019-20. In self-employment, gender discrimination increased both in rural and urban sector during this period. But, in wage employment it declined sharply in rural areas, while it increased in urban location. Earlier, women were restricted to enter into some specific activities, particularly in public sector jobs where job discrimination is expected to be low. Later on, the economy has been growing largely through the expansion of the private sector under neo-liberal reform. Work activities have been diversified because of outsourcing and other activities by private enterprises to make more profit. Scope of discrimination, particularly against women, has been increasing with the opening of new type of jobs which are primarily temporary in nature. Women, in many cases, are forced to accept such jobs in the private sector at any condition for survival of their families. Perhaps because of this reason gender discrimination in employment increased and at a faster rate in urban areas during 2004-05 to 2018-19. However, gender discrimination declined in 2019-20, although marginally, perhaps because a notable part of women workers who were in casual employment lost their job due to pandemic driven economic lockdown during the last quarter of survey round in 2019-20.

Caste discrimination is more in urban than in rural areas both in wage employment and self-employment. Employment gap because of caste differences declined in urban areas both in

wage employment and self-employment, and in rural areas in self-employment. As the economy opened up for global competition, caste discrimination declined, but still remained as a dominant part of job discrimination in wage employment in 2019-20. As job types have been diversified primarily through the expansion of private sector, affirmative measures in the shape of job reservations for disadvantaged castes have lost relevance in protecting them. In the private sector, job reservation norms are not effective at all, and many people in the vulnerable social groups fail to get good quality job in the private sector because they were discriminated in getting quality education to acquire necessary skill. Skill biased technological progress mainly in the private sector increases caste based discrimination in getting good quality job. Religious discrimination increased excepting for self-employed in the rural and wage worker in the urban economy.

In self-employment, gender discrimination increased at a very high rate both in rural and urban sectors during this period. Self-employment covers a large range of heterogeneous activities particularly in own-account jobs and women are concentrated mostly in low skilled jobs in vending and other activities. Caste and religious discrimination in self-employment declined significantly during the period between 2004-05 and 2019-20.

Table 2 Components of employment discrimination (in percentage): All India

	Rural			Urban		
	2004-05	2018-19	2019-20	2004-05	2018-19	2019-20
Wage worker						
Gender	41.6	14.2	8.7	2.7	18.2	16.6
Caste	44.3	59.1	62.6	71.0	60.3	63.7
Religion	14.0	26.6	28.7	26.2	21.5	19.7
Self-employed worker						
Gender	49.5	67.91	68.7	27.4	54.3	50.7
Caste	40.3	28.14	26.8	67.6	31.1	33.8
Religion	10.1	3.89	4.6	4.9	14.6	15.6
All workers						
Gender	54.8	62.5	27.5	17.4	27.9	5.9
Caste	37.4	31.3	47.3	79.1	57.3	85.0
Religion	7.7	6.2	25.2	3.4	14.8	9.1

Source: As for Table 1

4. Earning discrimination

Discrimination index of earnings is estimated separately for casual workers, regular salaried workers and self-employed workers in three different time points (2004-05, 2018-19 and 2019-20) by applying the methodology developed in Ferreira and Gignoux (2014). This is basically regression based parametric method in which daily wages for casual workers and monthly earning for regular salaried and self-employed workers are used as dependent variable. The estimated wage obtained from this wage regression model explains the variation of wages because of gender difference, caste difference and religious difference among workers in different types of employment. As described in technical notes in appendix of this paper, the ratio of inequality index of estimated earnings to inequality index of actual earnings provides the relative measure of discrimination which are shown in Table 3. Theil's T index is used to calculate inequality index of the estimated as well as actual earnings available in the sample data. This regression based approach provides the lower-bound estimates of discrimination index. This is primarily because the part of inequality due to unobserved circumstances might be wrongly attributed to endowment factors and unforeseen factors instead of to discrimination.

In 2004-05, around 9 per cent of wage inequality among casual wage workers in rural areas was discrimination which is ethically offensive and is not due to workers' productivity related endowment factors or to unforeseen factors. Wage discrimination for them jumped up to nearly one-fifth of the total inequality in 2018-19 and 2019-20. In urban locations also wage discrimination for casual workers increased, but at a lower rate during 2004-05 to 2018-19, but it declined in 2019-20 as compared to its value in the previous year. In regular paid jobs, similar kind of change in earning discrimination is observed in rural areas, but it declined, although slowly, in urban locations during 2004-05 to 2019-20. Earning discrimination among self-employed workers was higher than wage workers both in rural and urban areas (Table 3). The bootstrap standard errors shown below the estimated index in parentheses are based on 100 replications and its very low value indicates the robustness of the estimates.

Table 3 Discrimination index of earnings

	2004-05		2018-19		2019-20	
	Rural	Urban	Rural	Urban	Rural	Urban
Casual workers	0.09 (0.005)	0.06 (0.007)	0.19 (0.005)	0.13 (0.010)	0.19 (0.006)	0.10 (0.010)
Regular salaried	0.10	0.11	0.14	0.09	0.11	0.08

	(0.007)	(0.006)	(0.005)	(0.003)	(0.005)	(0.004)
Self employed			0.20	0.26	0.20	0.21
			(0.005)	(0.007)	(0.004)	(0.007)

Note: Figures in parentheses indicate bootstrap standard error

Source: As for Table 1

To find out the relative contributions of gender, caste and religion to total discrimination in wage and non-wage earnings, the estimated discrimination index is decomposed by applying Shapley decomposition method and the values are shown in percentage form in Table 4. Earning discrimination in Indian labour is driven mainly by gender. Gender difference among casual workers accounted for 88 per cent of wage discrimination in rural and 95 per cent in urban areas in 2019-20. Gender discrimination of earning was similarly high among self-employed workers as well as regular paid workers during this period. It is observed that gender discrimination increased tremendously in earnings for all types of workers during 2004-05 to 2019-20 in every location in India.

In 2004-05, religious difference among casual workers accounted for more than one-third of total wage discrimination in rural and around one fifth in urban areas, while religious discrimination among regular paid workers was one fifth of earning discrimination both in rural and urban areas. Religious discrimination in earning declined dramatically among casual workers both in rural and urban areas, and among regular paid workers in rural areas during 2004-05 to 2019-20. However, earning discrimination because of religious difference among workers in regular paid jobs in urban areas declined very slowly during this period. Caste discrimination in pay among regular salaried workers was more than 50 per cent in rural and nearly 60 per cent in urban areas in 2004-05, but it declined gradually over these three time points. Caste discrimination in earning was comparatively less among self-employed workers in rural areas and casual workers in urban areas in 2019-20.

Table 4 Decomposition of discrimination index of earnings (in per cent)

	2004-05		2018-19			2019-20		
	Casual workers	Regular salaried	Casual workers	Regular salaried	Self employed	Casual workers	Regular salaried	Self employed
Rural								
Gender	55	27	90	76	91	88	75	93
Caste	10	52	3	20	6	6	20	4
Religion	35	21	7	4	3	6	5	3
Urban								
Gender	71	21	90	41	84	95	40	84

Caste	7	59	5	43	12	2	47	11
Religion	22	20	5	16	4	3	13	5

Note: Decomposition is done by using Shapley method

Source: As for Table 1

5. Conclusions

Discrimination of different dimensions is a serious cause of concern from the point of view of social justice and equity. This paper quantifies discrimination in employment and earning in the labour market and analyses how much of inequality in employment and earning is due to differences in gender, caste, and religion during the high growth regime under neoliberal reform. Discrimination in employment opportunities and in earnings is measured for three different groups of workers, namely casual wage workers, self-employed workers and regular salaried workers, by considering gender, castes and religion as probable factors responsible for it at the national level as well as in each state and union territory.

This study observes that job discrimination is significantly high in wage employment than in self-employment both in the rural and urban economy. While in wage employment job discrimination declined, in self-employment it increased in India. Gender discrimination was less significant at the beginning of this century, but it jumped up sharply in 2018-19. Discrimination against women has been increasing with the opening of new type of jobs which are primarily temporary in nature. Castes, on the other hand, accounted for roughly three fourth of total discrimination in wage employment in rural areas and 70 per cent in urban areas in 2004-05. It declined later on, but very slowly. The expansion of the private sector fails to protect the vulnerable social groups against job discrimination because they were discriminated in getting quality education to acquire necessary skill. In wage employment, while caste difference accounts for the major part of total discrimination, gender discrimination increased in most of the states. Gender discrimination is much higher in self-employment than in wage employment. While religious discrimination in wage employment increased in the rural economy, it declined in urban areas during 2004-05 to 2019-20.

Wage discrimination is highly associated with employment discrimination. Wage discrimination for casual wage workers jumped up significantly. While earning discrimination for workers in regular paid jobs in rural areas increased, it remained stable at in urban areas.

Earning discrimination among self-employed workers was higher than wage workers particularly in urban areas. Gender discrimination increased tremendously in earnings for all types of workers in every location in India. Earning discrimination among workers is much less in regular paid jobs than in casual workers and self-employed workers in every state as expected.

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Appendix

Technical notes on estimation

We assume that any outcome like employment and earning of a person depends on person's endowments like level of education, work experience, job training, skill and other productivity related factors (E), and on those factors which are beyond the individual's control like gender, castes and religion (C), and unobserved random factors (u):

$$y_i = g(C_i, E_i, u_i) \quad (1)$$

Thus, outcome differences occur because of the differences in E , C , and u . Outcome inequality between individuals with the same E but differences in C is not ethically justified. In this study, we define discrimination as that part of inequality which appears because of the differences in gender, castes and religion between individuals with the same levels of education, experience and other productive factors endowed by them.

In our study, C is exogenous variable in the sense that an individual has no control over them, but E is endogenous and depends partially on C :

$$E_i = E_i(C_i, \varepsilon_i) \quad (2)$$

For example, education level of a child partly depends on family background along with castes and ethnic factors.

Thus, equation (1) becomes

$$y_i = g(C_i, E_i(C_i, \varepsilon_i), u_i) \quad (3)$$

By following Wendelspiess and Soloaga (2014) we estimate the outcome generating function (3) by applying OLS.

The linear form of (1) and (2) are given respectively as

$$y_i = C_i' \beta + E_i' \gamma + u_i \quad (1')$$

$$E_i = C_i' \delta + \varepsilon_i \quad (2')$$

Therefore, the reduced form of (3) is

$$y_i = \underbrace{C_i' \beta}_{\text{direct effect}} + \underbrace{C_i' \gamma \delta}_{\text{indirect effect}} + \underbrace{\gamma \varepsilon_i}_{\text{effort effect}} + \underbrace{u_i}_{\text{residual}} \quad (3')$$

or,

$$y_i = C_i' \theta + v_i \quad (4)$$

where

$$\theta = \beta + \gamma \delta$$

and

$$v_i = \gamma \varepsilon_i + u_i$$

The explained variability of this regression model will capture both the direct effect of circumstances and the indirect effect that circumstances play, through their effect on effort.

The distribution of the predicted outcomes $\hat{y}_i = C_i' \hat{\theta}$ is the ex-ante counterfactual distribution of outcome variable y_i . A major weakness of this regression based approach is that it provides only lower-bound estimates of discrimination index (Ramos and Van de gaer 2012).

The inequality index of \tilde{y}_{EA} is the parametric measure of absolute discrimination index: $I(\hat{y}_i)$ All variation in the vector \tilde{y}_{EA} is exclusively due to circumstances. We calculate relative measure of discrimination by taking the ratio of this inequality measure to the inequality of actual outcome y :

$$D_r = \frac{I(\hat{y}_i)}{I(y)}$$

By following Ferreira and Gignoux (2014), to estimate employment discrimination we have used the reduced form of employment equation:

$$y_i^* = C_i' \theta + v_i \quad (5)$$

As job quality (y_i^*) is a latent variable which is not observed properly, we define a binary variable (y_i) on the basis of job conditions which are observed in the data:

$$y_i = \begin{cases} 1, & \text{for } y_i^* > 0 \\ 0, & \text{elsewhere} \end{cases}$$

If a person works in regular paid jobs with high occupational status for longer period, then job quality is defined to be good and $y_i^* > 0$. In the dataset used in this study, regular paid jobs are identified by principal activity status, high occupation status is defined by national classification of occupation (NCO) at one digit level, longer period of job is defined in terms of job contract for more than 3 years.

By following Barros, de Carvalho, and Franco (2007), in calculating discrimination index of job quality (y_i) which is binary by construction, we first estimate the binary response model by using probit link function for the whole sample of working age people, and the sub-samples of rural and urban locations, and also for each states and union territories. Then we calculate the dissimilarity index by using the conditional probability. The index obtained in this method follows the property of scale invariance.

Decomposition of discrimination index

The Shapley decomposition (Shorrocks 1982), based on the well-known concept of Shapley value in cooperative game theory, is used to find out the relative contribution of gender, caste and religion to discrimination. The idea of the Shapley value is to compute the value of a function considering all the possible combinations of circumstances. The sample used in this study is partitioned into 3 subgroups. Now, the discrimination index can be looked at as a function of the observed outcomes,

$$IOP = f(x_{11} \dots x_{N_1 1}, x_{12} \dots x_{N_2 2}, \dots, x_{13} \dots x_{N_3 3}) \quad (6)$$

x_{ij} is outcome of the i^{th} person ($i = 1, \dots, N_j$) in subgroup $j = 1, 2, 3$. N_j denotes number of persons in group j .

Additive decomposition is made by considering the impact of inequality within subgroups, inequality between subgroups, ranking and relative size in each subgroup (see Deutsch and Silber 2007, for detail). By using Shapley decomposition, we can derive the marginal impact of each circumstance measuring the difference in the value of the discrimination index corresponding to the observed situation and the reference one, where the outcome does not change with that circumstance.