

# Caste Discrimination in the Indian Urban Labour Market: Evidence from the National Sample Survey

*This paper uses National Sample Survey data to examine the wage gap between higher castes and the scheduled castes/tribes in the regular salaried urban labour market. The main conclusions we draw are (a) discrimination causes 15 per cent lower wages for SC/STs as compared to equally qualified others; (b) SC/ST workers are discriminated against both in the public and private sectors, but the discrimination effect is much larger in the private sector; (c) discrimination accounts for a large part of the gross earnings difference between the two social groups in the regular salaried urban labour market, with occupational discrimination – unequal access to jobs – being considerably more important than wage discrimination – unequal pay in the same job; and (d) the endowment difference is larger than the discrimination component.*

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Though the occupational placement of caste groups varies across India, a common feature is the sharp contrast in status and income between scheduled castes (SCs) and scheduled tribes (STs) on the one hand, and so-called forward castes on the other. Since independence, the government has sought to alleviate these inequalities by instituting affirmative action in political representation, in higher education and in government and public sector employment. These policies reserve seats in local and national legislatures for SC, ST and Other Backward Classes (OBCs) applicants, and mandate a certain quota of jobs in the government and public sector for them.

Despite these efforts, the educational level of the SCs continues to lag behind that of the general population, and the overwhelming majority of the SC/ST, OBC population is still found in less-skilled and lower-paying jobs. This paper examines inequalities in employment, occupation and earnings, between SC/ST, OBC and forward caste Indians, and then statistically decomposes those gaps into separate components, one explainable through differences in factors such as education, and the other representing discrimination in employment and wages.

Many commentators acknowledge the prevalence of caste inequality in rural India, but believe that caste discrimination is much less important in urban India. Others believe that caste discrimination occurs primarily in operative jobs, but not in salaried white-collar positions. This paper focuses upon inequality in the formal sector in urban India, and pays special attention to caste-related income and employment gaps among highly educated employees.

## I Sources of Data and Decomposition Methodology

Data for this study comes from the 38th (1983), 50th (1993-94), and 55th (1999-2000) rounds of the all-India household survey conducted by the National Sample Survey Organisation (NSSO).

Our study confines itself to urban regular- or salaried-sector workers aged between 15 and 65 years. The wage distribution was trimmed by 0.1 per cent at the top and bottom tails. Nominal wages were converted to 1993 prices using the consumer price index for wages of urban industrial workers (CPI – IW).

Scholars have, in the past, pointed out the lack of comparability of data across different rounds of NSS, especially in regard to caste identities of the working population. Until 1993-94 (round 50), the SCs and STs were treated as one group while the rest were treated together as “Others” or as “non-SC/ST”. Such a categorisation assumed that the work conditions, patterns of discrimination were similar among the Others, consisting of not only the forward castes but also the OBCs. For the purposes of analysis and explanation in this paper, we use the term “Others”, in two ways, reflecting the changing definitions in the NSS rounds. Until 1993-94, it is meant to consist of both forward castes and OBCs, while after 1999-2000, it refers to merely the forward castes. This is in view of the creation then of a separate category of OBCs in addition to SC/ST and Others.

Three different empirical approaches for studying caste discrimination can be found in prior research. The first of these includes caste as a predictor while predicting earnings from the characteristics of all workers (a single-equation technique). Unfortunately, this approach yields a biased result because it assumes that the wage structure is the same for both the non-scheduled castes (NSCs) and the SC/STs. It thus constrains the values of coefficients of explanatory variables, such as education and experience, to be the same for SC/ST and for NSCs [Gunderson 1989; Madheswaran 1996].<sup>1</sup> In this section, for the case of notation, we have used NSC for non-scheduled castes and SC for both scheduled castes and tribes.

The second approach employs a “decomposition technique” to partition the observed wage gap into two “endowment” and a “coefficient” components. The latter is derived as an unexplained residual and is termed the “discrimination coefficient”. This method was first developed by Blinder (1973) and Oaxaca

(1973), and later extended to incorporate selectivity bias [Reimer 1983, 1985] and to overcome the index number problem [Cotton 1988; Neumark 1988; Oaxaca and Ransom 1994].

The third “expanded approach” incorporates the occupational distribution into the earnings estimation, and was first proposed by Brown, Moon and Zoloth (1980). An advantage of using this expanded method is that both job discrimination (differential access to certain occupational positions) and wage discrimination (differential earnings within the same job) can be estimated simultaneously.

We have employed all the three methods mentioned above to estimate the extent of discrimination against lower caste workers in urban India. We have also attempted a refinement to the expanded decomposition approach by combining Oaxaca and Ransom (1994) and Brown, Moon and Zoloth (1980) to produce a more detailed decomposition analysis of occupational and wage discrimination. In the following sections, we will lay out the mathematical logic of this decomposition:

*The Blinder-Oaxaca decomposition method:* Decomposition enables the separation of the wage differential into one part that can be explained by differences in individual characteristics and another part that cannot be explained by differences in individual characteristics. The gross wage differential can be defined as:

$$G = \frac{Y_{nsc} - Y_{sc}}{Y_{sc}} = \frac{Y_{nsc}}{Y_{sc}} - 1 \quad \dots(1)$$

where  $Y_{nsc}$  and  $Y_{sc}$  represent the wages of higher or NSC individuals and wages of individuals belonging to the SC categories, respectively. In the absence of labour market discrimination, the NSC and SC wage differential would reflect pure productivity differences:

$$Q = \frac{Y_{nsc}^0}{Y_{sc}^0} - 1 \quad \dots(2)$$

where the superscript zero denotes the absence of market discrimination. The market discrimination coefficient (D) is then defined as the proportionate difference between G+1 and Q+1

$$D = \frac{(Y_{nsc}/Y_{sc}) - (Y_{nsc}^0/Y_{sc}^0)}{(Y_{nsc}^0/Y_{sc}^0)} \quad \dots(3)$$

Equations (1)-(3) imply the following logarithmic decomposition of the gross earnings differential:

$$\ln(G + 1) = \ln(D + 1) + \ln(Q + 1) \quad \dots(4)$$

This decomposition can be further applied within the framework of semi-logarithmic earnings equations [Mincer 1974] and estimated via Ordinary Least Squares (OLS) such that:

$$\ln \bar{Y}_{nsc} = \sum \hat{\beta}_{nsc} \bar{X}_{nsc} + \epsilon_{nsc} \text{ (non-SC wage equation)} \quad \dots(5)$$

$$\ln \bar{Y}_{sc} = \sum \hat{\beta}_{sc} \bar{X}_{sc} + \epsilon_{sc} \text{ (SC wage equation)} \quad \dots(6)$$

where  $\ln \bar{Y}$  denotes the geometric mean of earnings,  $\bar{X}$  the vector of mean values of the regressors,  $\hat{\beta}$  the vector of coefficients and  $\epsilon$  is the error term with zero mean and constant variance. Within this framework, the gross differential in the logarithmic term is given by

$$\ln(G+1) = \ln(\bar{Y}_{nsc}/\bar{Y}_{sc}) = \ln \bar{Y}_{nsc} - \ln \bar{Y}_{sc} = \sum \hat{\beta}_{nsc} \bar{X}_{nsc} - \sum \hat{\beta}_{sc} \bar{X}_{sc} \quad \dots(7)$$

The Oaxaca decomposition simply shows that equation (7) can be expanded. In other words, the difference in the coefficients of the two earnings functions is taken as a priori evidence of discrimination. If, for a given endowment, SC individuals are paid according to the NSC wage structure in the absence of discrimination, then the hypothetical SC earnings function can be given as:

$$\ln \bar{Y}_{sc} = \sum \hat{\beta}_{nsc} \bar{X}_{sc} \quad \dots(8)$$

Subtracting equation (8) from equation (7) we get

$$\ln \bar{Y}_{nsc} - \ln \bar{Y}_{sc} = \sum \hat{\beta}_{nsc} (\bar{X}_{nsc} - \bar{X}_{sc}) + \sum \bar{X}_{sc} (\hat{\beta}_{nsc} - \hat{\beta}_{sc}) \quad \dots(9)$$

Alternatively, the decomposition can also be done as

$$\ln \bar{Y}_{nsc} - \ln \bar{Y}_{sc} = \sum \hat{\beta}_{sc} (\bar{X}_{nsc} - \bar{X}_{sc}) + \sum \bar{X}_{nsc} (\hat{\beta}_{nsc} - \hat{\beta}_{sc}) \quad \dots(10)$$

In equations (9) and (10) above, the first term on the right hand side can be interpreted as education and other endowment differences. The second term in these equations has been regarded in the literature as the discrimination component. Studies use either of these alternative decomposition forms (equation 9 or 10) based on their assumptions about the wage structure that would prevail in the absence of discrimination. Some authors prefer to take the average of the estimates of the two equations [Greenhalgh 1980]. This particular issue is known as “the index number problem”.

*The Cotton, Neumark and Oaxaca/Ransom decomposition method:* To resolve the index number problem, Cotton (1988) and Neumark (1988) and Oaxaca and Ransom (1994) have proposed an alternative decomposition that extends the wage discrimination component further. They calculate non-discriminatory or competitive wage structures which can be used to estimate overpayment and underpayment. The true non-discriminatory wage would lie somewhere between the NSC and SC wage structure. The Cotton logarithmic wage differential is written as:

$$\ln \bar{Y}_{nsc} - \ln \bar{Y}_{sc} = \sum \beta^* (\bar{X}_{nsc} - \bar{X}_{sc}) + \sum \bar{X}_{nsc} (\hat{\beta}_{nsc} - \beta^*) + \sum \bar{X}_{sc} (\beta^* - \hat{\beta}_{sc}) \quad \dots(11)$$

where  $\beta^*$  is the reward structure that would have occurred in the absence of discrimination. The first term on the RHS of equation (11) above is skill differences between SC/ST and NSC, while the second term represents the overpayment relative to NSCs due to favouritism, and the third term the underpayment to SC due to discrimination. The decomposition specified in equation (11) above cannot be made operational without some assumptions about the salary structures for SC and NSC in the absence of discrimination. The theory of discrimination provides some guidance in the choice of the non-discriminatory wage structure. The assumption is operationalised by weighting the NSC and SC wage structures by respective proportions of NSC and SC in the labour force. Thus, the estimator  $\beta^*$  used above is defined as

$$\beta^* = P_{nsc} \hat{\beta}_{nsc} + P_{sc} \hat{\beta}_{sc} \quad \dots(12)$$

where  $P_{nsc}$  and  $P_{sc}$  are the sample proportions of NSC and SC/ST populations and  $\hat{\beta}_{nsc}$  and  $\hat{\beta}_{sc}$  the NSC and SC pay structures respectively.

Another versatile representation of a nondiscriminatory or pooled wage structure is proposed by Neumark (1988) and Oaxaca and Ransom (1994). It can be written as

$$\beta^* = \Omega \hat{\beta}_{NSC} + (I - \Omega) \hat{\beta}_{SC} \quad \dots(13)$$

where  $\Omega$  is a weighting matrix.  $I$  is the identity matrix. The weighting matrix is specified by

$$\Omega = (X' X)^{-1} (X'_{NSC} X_{NSC}) \quad \dots(14)$$

where  $X$  is the observation matrix for the pooled sample.  $X_{NSC}$  is the observation matrix for the NSC sample. The interpretation of  $\Omega$  as weighting matrix is readily seen by noting that:

$$X' X = X'_{NSC} X_{NSC} + X'_{SC} X_{SC} \quad \dots(15)$$

where  $X_{SC}$  is the observation matrix of the SC sample. Given  $\hat{\beta}_{NSC}$ ,  $\hat{\beta}_{SC}$  and equation (13), any assumption about  $\beta^*$  reduces to an assumption about  $\Omega$ .

*Expanded decomposition to estimate both wage and job discrimination:* Both the Oaxaca (1973) and Cotton (1988) and Neumark (1988) methods can be criticised on the grounds that they do not distinguish between wage discrimination and job discrimination. Brown et al (1980) incorporate a separate model of occupational attainment into their analysis of wage differentials. Banerjee and Knight (1985) used this decomposition by introducing a multinomial logit model which could estimate both wage and occupational discrimination for migrant labourers in India, where the latter is defined as “unequal pay for workers with same economic characteristics which results from their being employed in different jobs”. In the following section, we combine elements from Oaxaca and Ransom (1994) and Brown et al (1980) to form a more detailed decomposition analysis of occupational and wage discrimination. We believe that this represents a theoretical advance in terms of examining discrimination as the combined consequence of unequal access to certain jobs and unequal pay within jobs.

We have seen that equation (7) was used [following Oaxaca 1973] to estimate the gross logarithmic wage differential between caste groups. Our concern is with estimating occupational discrimination as well as wage discrimination. The proportion of NSC ( $P_{iNSC}$ ) and the proportion of SC's ( $P_{iSC}$ ) in each occupation  $i$  are included in the decomposition. Equation 7 is thus expanded to:

$$\ln(G + 1) = \sum [P_{iSC} \ln \bar{Y}_{iNSC} - P_{iSC} \ln \bar{Y}_{iSC}] \quad \dots(16)$$

Using the method in Brown et al (1980), Moll (1992, 1995), Banerjee and Knight (1985), this can be further decomposed as:

$$\ln(G + 1) = \sum_i \ln \bar{Y}_{iNSC} (P_{iNSC} - P_{iSC}) + \sum_i P_{iSC} (\ln \bar{Y}_{iNSC} - \ln \bar{Y}_{iSC}) \dots(17)$$

The first term on the right hand side of the equation represents the wage difference attributable to differences in the occupational distribution and the second term is attributable to the difference between wages within occupations. Each of these terms contains an explained and unexplained component. If we define  $\hat{P}_{iSC}$  as the proportion of SC workers that would be in occupation

$i$  if they had the same occupational attainment function as NSC, then decomposing equation (17) further yields:

$$\ln(G + 1) = \sum_i \ln \bar{Y}_{iNSC} (P_{iNSC} - \hat{P}_{iSC}) + \sum_i \ln \bar{Y}_{iNSC} (\hat{P}_{iSC} - P_{iSC}) + \sum_i P_{iSC} (\ln \bar{Y}_{iNSC} - \ln \bar{Y}_{iSC}) \quad \dots(18)$$

where the first term represents the part of the gross wage differential attributable to the difference between the observed NSC occupational distribution and the occupational distribution that SC workers would occupy if they had the NSC's occupational function; the second term is the component of the gross wage differential attributable to occupational differences not explained on the basis of personal characteristics, and may be termed job discrimination; and the third term represents the within-occupation wage differential. The proportions  $P_{iNSC}$  and  $\hat{P}_{iSC}$  are estimated using a multinomial logit model. First we estimate an occupational attainment function for NSC and then we use these estimates to predict the proportion of SC workers that would be in occupation ( $i$ ) if they had the same occupational attainment function as NSC. This predicted probability of SC occupation is used in the further decomposition.

The third term in equation 18 represents the within-occupation wage differential and is normally decomposed into a wage discrimination and a caste productivity term. However, instead of doing this, the term can be decomposed into an NSC overpayment term, an SC underpayment term, and a within-occupation wage differential explained by productivity characteristics of the two groups. In order to calculate these three terms, the “pooled” methodology of Oaxaca and Ransom (1994) is used. Equation 19 presents the within-occupation gross caste wage differential defined as:

$$\sum_i P_{iSC} \ln(G + 1) = \sum_i P_{iSC} [\ln \bar{Y}_{iNSC} - \ln \bar{Y}_{iSC}] \quad \dots(19)$$

The actual proportion of SC workers in each occupational group is dropped for simplicity until the final equation is derived. It will be noted that equation 19 is identical to equation 7 but for the occupation subscript. Following the methodology of Oaxaca and Ransom (1994), the within-occupation gross wage differential is decomposed into a productivity differential and an unexplained effect that may be attributed to within-occupation wage discrimination. The within-occupation logarithmic productivity differential is defined as  $\sum_i \ln(Q + 1)$ , where “ $Q$ ” is the gross unadjusted productivity differential. In order to calculate the logarithmic term, a non-discriminatory or “competitive” wage structure is required so that:

$$\sum_i \ln(Q + 1) = \ln \bar{Y}_{iNSC}^* - \ln \bar{Y}_{iSC}^* \quad \dots(20)$$

where  $\ln \bar{Y}_{ir}^*$  is the average non-discriminatory wage structure for caste “ $r$ ” in occupation  $i$ . In order to calculate the pooled wage structure, the NSC and SC logarithmic wage structures are estimated using an earnings function, with the assumption that:

$$\ln \bar{Y}_{ir} = \tilde{\beta}_{ir} (\bar{X}_{ir}) \quad \dots(21)$$

where  $\tilde{\beta}_r$  and  $\bar{X}_r$  are the vector of coefficients and average productivity characteristics of the different caste workers, estimated by OLS.<sup>2</sup> The calculation of the non-discriminatory wage structure depends on the weighting given to the NSC and SC wage structures. We have discussed in equations (13) and (14)

[Oaxaca and Ransom 1994] about the pooled wage structure. Given the pooled wage structure in equation (13), within-occupation logarithmic wage discrimination is calculated by subtracting equation 20 from equation 19 to give us,

$$\sum_i \ln(D+1) = (\ln \bar{Y}_{iNSC} - \ln \bar{Y}_{iNSC}^*) + (\ln \bar{Y}_{isc} - \ln \bar{Y}_{isc}^*) \quad \dots(22)$$

The gross wage differential is thus decomposed into a productivity and a discriminatory term, meaning that the final within-occupation gross logarithmic wage differential is equivalent to:

$$\sum_i P_{isc} (\ln(G+1)) = \sum_i P_{isc} [\ln \bar{Y}_{iNSC}^* - \ln \bar{Y}_{isc}^*] + \sum_i P_{isc} [\ln \bar{Y}_{iNSC} - \ln \bar{Y}_{isc}^*] + \sum_i P_{isc} [\ln \bar{Y}_{isc}^* - \ln \bar{Y}_{isc}] \quad \dots(23)$$

Substituting equation (23) for the third component in equation (18), yields the final decomposition of the gross-logarithmic wage differential,

$$\ln(G+1) = \sum_i \ln \bar{Y}_{iNSC} (P_{iNSC} - \hat{P}_{isc}) + \sum_i \ln \bar{Y}_{iNSC} (\hat{P}_{isc} - P_{isc}) + \sum_i P_{isc} [\ln \bar{Y}_{iNSC}^* - \ln \bar{Y}_{NSC}] + \sum_i P_{isc} [\ln \bar{Y}_{iNSC} - \ln \bar{Y}_{iNSC}^*] + \sum_i P_{isc} [\ln \bar{Y}_{isc}^* - \ln \bar{Y}_{isc}] \quad \dots(24)$$

Hence a multinomial logit non-discriminatory model can be calculated which can distinguish between within-occupation SC underpayment, within-occupation NSC overpayment, and occupational discrimination. Finally, to estimate this model, Equations (21) and (13) are substituted into equation (24) to give final extended decomposition as

$$\ln(G+1) = \sum_i \tilde{\beta}_{iNSC} (\bar{X}_{iNSC}) (P_{iNSC} - \hat{P}_{isc}) \quad (\text{Job Explained}) + \sum_i \tilde{\beta}_{iNSC} (\bar{X}_{iNSC}) (\hat{P}_{isc} - P_{isc}) \quad (\text{Job Discrimination}) + \sum_i P_{isc} [\tilde{\beta}_i^* (\bar{X}_{iNSC} - \bar{X}_{isc})] \quad (\text{Wage Explained}) + \sum_i P_{isc} [\bar{X}_{iNSC} (\tilde{\beta}_{iNSC} - \tilde{\beta}_i^*)] \quad (\text{Wage overpayment to NSC}) + \sum_i P_{isc} [\bar{X}_{isc} (\tilde{\beta}_i^* - \tilde{\beta}_{isc})] \quad (\text{Wage underpayment to SC}) \quad \dots(25)$$

The wage overpayment and underpayment together constitute wage discrimination.

## II Econometric Results

### Mincerian Earnings Function Results

To estimate the earnings differences attributed to discrimination, we estimated an augmented Mincerian earnings function separately for NSC (excluding OBC), SC/ST and OBC in the regular/salaried labour market. The logarithm of the daily wage rate was used as the dependent variable, while age, level of education, gender, marital status, sector, job tenure, union status, occupation and region were predictors. The results are generally consistent with human capital theory and a priori expectations. The earnings function results for the year 1999-2000 are given<sup>3</sup> in Table 1. The descriptive statistics and definition of the variables used in the OLS model is given in the Appendix.

First, we examined the returns to education for NSC (non-SC/ST, including OBC and Others as per the 1993-94 NSS classification) and SC/ST workers and the changes in these returns following the economic liberalisation of the 1990s. In common with other studies, the marginal wage effects of education are found to be significantly positive and monotonically increasing with education level. Duraisamy (2002) and Dutta (2004) are the only other national studies that compare returns to education in India over time. However, those studies calculated rates of return to education by gender and by sector. To the best of our knowledge, no previous study in India has estimated the rates of return to education by caste using a nationally representative sample. The average rate of return to each education level,  $\tau_j$ , can be estimated as follows:

$$\gamma_k = \frac{(\beta_k - \beta_{k-1})}{(S_j - S_{j-1})}$$

where  $j$  = primary, middle, secondary, higher secondary and graduate school,  $\beta_i$  is the coefficient in the wage regression models and  $S_j$  the years of schooling at education level  $j$ . The rate of return to primary education is estimated as follows:

$$\gamma_{\text{Primary}} = \frac{\beta_{\text{Prim}}}{S_{\text{Prim}}}$$

**Table 1: Earnings Function: OLS Results – Regular Workers – Urban India**

Variables	1999-2000					
	Other Caste		SC		OBC	
	Coeff	t-value	Coeff	t-value	Coeff	t-value
Age	0.04186	14.28	0.063607	10.86	0.050079	12.78
agesq	-0.00034	-9.24	-0.00062	-8.32	-0.00045	-9.23
Bprim	0.118523	4.46	0.125573	3.53	0.110725	3.74
Primary	0.155207	6.48	0.095845	3.09	0.177313	6.79
Middle	0.231942	11.06	0.225104	7.87	0.292325	12.14
Secondary	0.457122	22.85	0.388247	13.15	0.456787	19.28
High school	0.586235	27.78	0.564215	16.33	0.574385	21.6
Graduate	1.217369	46.13	1.030238	11.64	1.154985	26.52
Grad other	0.874313	44.76	0.723349	22.42	0.820725	32.55
Male	0.226024	19.79	0.266195	11.22	0.375886	22.44
Married	0.108977	8.64	0.03983	1.56	0.097785	5.54
Public	0.275494	27.34	0.309054	14.54	0.335282	21.25
Unionmem	0.216788	21.53	0.268418	12.19	0.335363	21.64
Permanent	0.278837	25.18	0.268317	11.55	0.178827	12.05
South	0.072278	6.1	0.171682	7.27	0.091458	6.18
West	0.066188	6.59	0.065884	3.11	0.090175	4.82
East	-0.04017	-2.93	0.006045	0.2	0.119431	4.17
_cons	2.667867	49.88	2.264271	22.18	2.31265	33.37
R-square	0.514		0.5287		0.5515	
Adj R <sup>2</sup>	0.5136		0.5267		0.5507	
F	1267.12		287.65		699.94	
N	20706		4380		9695	

Notes: Others = excluding OBC; 1 per cent level significance = 2.58; 5 per cent level significance = 1.96.

**Table 2: Average Private Rate of Return to Education by Caste (in per cent)**

Educational Level	1983		1993-94		1999-2000		
	NSC*	SC	NSC*	SC	Others	SC	OBC
Primary	4.21	4.48	3.26	1.39	3.10	1.92	3.55
Middle	5.05	6.43	3.54	3.19	2.56	4.31	3.83
Secondary	16.95	16.28	9.86	4.77	11.26	8.16	8.22
HSC	NA	NA	5.21	12.92	6.46	8.80	5.88
Graduate professional	9.61	7.47	9.67	7.23	12.62	9.32	11.61
Graduate general	8.08	5.98	7.87	4.65	9.60	5.30	8.21
Professional degree compared to general degree	12.66	10.44	12.37	11.10	17.15	15.34	16.71

Note: NSC \* includes OBCs and Others.

The omitted category for the education dummy variables is that of those workers who are illiterate or have less than 2 years of any type of formal education. The estimated rates of return to additional years of schooling are reported in Table 2.

Table 2 suggests that there is an incentive to acquire more education if the individual is in regular wage employment – the returns to acquiring education are all positive. Comparison of rates of return to education (RRE) through the three rounds reveal a few interesting features. First, SC/STs have a considerably lower RRE than the rest (i.e., NSC, Others and OBC) at nearly all levels of education, especially during the post-reforms period (1993-94 and 1999-2000). Second, among themselves as a group, there seems to be a limiting factor at work that restricts the SC/STs to achieving only a marginal rise in RRE until the secondary/HSC level of education. Additional education does any give better RRE at a lower level education. This pattern has not changed during the reform period. Indeed, between SC/ST and Others (whether as NSC or as OBC + Others), the SC/STs have shown that during every subsequent period they have to move to a much higher level of education in order to improve their RRE – even though actual per cent figures may be much less than the previous round. In contrast, not only the rest have more or less stable RRE at each level of education during the successive periods, the per cent figures too improve over the years. In short, the rate of returns in education for the SC/STs over the three periods indicate a decline at each level thus necessitating people in the group to struggle to reach higher levels of education to maintain their standards of living. If we look at the 1999-2000 results, the rate of return is usually higher for OBCs than for SC workers. These differential rates of return to education between castes suggest a substantial amount of labour market discrimination.

The premium to skill appears to be increasing over time due to liberalisation and this has led to increasing levels of wage inequality in urban India [Kijima 2006]. Several other studies have found evidence of increasing educational returns for the more educated during periods of rapid economic change. For instance, Foster and Rosenzweig (1996) found that during the green revolution in India, increasing educational returns were concentrated among the more educated. Kingdon (1998) finds in her review on the returns to education in India (mainly computed from specialised surveys in urban areas of a particular state or city) that the rate of return to education, as in Table 2, tends to rise with education level. Newell and Reilly (1999) also found in their study on transitional economies during the 1990s that the private rates of return to education rose after a period of labour market reforms. However, we find that there is a markedly lower rate of return to scheduled caste and OBC compared to other caste workers.

### Decomposition Results

As mentioned in our methodology section, we initially adopt a single equation method. We found that, compared to forward caste employees, SC/ST workers earned 5.0 per cent less in 1983, 8.4 per cent less in 1993-94, and 8.9 per cent less in 1999-2000. OBCs earned 10.9 per cent less than forward caste employees in 1999-2000. These coefficients are all statistically significant. A single equation approach assumes that the slope coefficients are the same for all social groups. In order to overcome this

limitation, we next estimated an earnings function separately for each social group over the period of time and subjected the earnings equation to decomposition, following the Blinder-Oaxaca approach. The results are reported in Table 3.

Table 3 indicates that the endowment component is larger than the discrimination component. Nevertheless, discrimination explains 13.45 per cent (in 1983), 30.4 per cent (in 1993-94) and 20.4 per cent (in 1999-2000) of the lower wages of SC workers as compared to NSC in the regular urban labour market. Discrimination causes 31.9 per cent of the lower wages for the OBCs as compared to Others in 1999-2000.

Two points are especially noteworthy. First, the large endowment difference in developing countries like India implies that pre-market discriminatory practices with respect to education, health and nutrition are more crucial in explaining wage differentials than labour market discrimination. The endowment difference has decreased over the period from 1983 to 1999-2000. This is consistent with evidence available about the impact of the reservation system in Indian education. Student enrolment,

**Table 3: Blinder-Oaxaca Decomposition Results**

Components of Decomposition	1983	1993-94	1999-2000	1999-2000 OBC vs Others
Amount attributable:	30.9	15.2	-9.7	-0.5
- due to endowments (E):	25.1	18.8	24.4	23.8
- due to coefficients (C):	5.8	-3.6	-34.1	-24.4
Shift coefficient (U):	-1.9	11.8	40.4	35.5
Raw differential (R): {E+C+U}:	29	26.9	30.6	35
Adjusted differential (D): {C+U}:	3.9	8.2	6.2	11.2
Endowments as per cent total (E/R):	86.55	69.6	79.0	68.1
Discrimination as per cent total (D/R):	13.45	30.4	21.4	31.9

*Notes:* (1) A positive number indicates advantage to forward caste; Negative numbers indicate advantage to SCs and STs.

(2) The results from decomposition are presented using Blinder's (1973) original formulation of E, C, U and D. The endowments (E) component of the decomposition is the sum of (the coefficient vector of the regressors of the high-wage group) times (the difference in group means between the high-wage and low-wage groups for the vector of regressors). The coefficients (C) component of the decomposition is the sum of the (group means of the low-wage group for the vector of regressors) times (the difference between the regression coefficients of the high-wage group and the low-wage group). The unexplained portion of the differential (U) is the difference in constants between the high-wage wage and the low-wage group. The portion of the differential due to discrimination is C + U. The raw (or total) differential is E + C + U. The unexplained component is the difference in the shift coefficients (or constants) between the two wage equations. Being inexplicable, this component can be attributed to discrimination. However, Blinder also argued that the explained component of the wage gap also contains a portion that is due to discrimination. To examine this Blinder decomposed the explained component into: (1) the differences in endowments between the two groups, "as evaluated by the high-wage group's wage equation"; and (2) "the difference between how the high-wage equation would value the characteristics of the low-wage group, and how the low-wage equation actually values them". Blinder called the first part the amount "attributable to the endowments" and the second part the amount "attributable to the coefficients", and he argued that the second part should also be viewed as reflecting discrimination: "[this] only exists because the market evaluates differently the identical bundle of traits if possessed by members of different demographic groups, [and] is a reflection of discrimination as much as the shift coefficient is." Conventionally, the high-wage group's wage structure is regarded as the "non-discriminatory norm", that is, the reference group. The average endowment differences are now weighted by the high-wage workers' estimated coefficients, and the coefficient differences are weighted by the mean characteristics of the low-wage workers. One can also do the reverse.

including that of students under the reservation system, has been increasing [Thorat 2005; Weisskopf 2004]. However, reservation quotas in employment and educational institutions are still fall short of their targets for some levels of education and for some categories of jobs.

Second, in the decomposition, wage discrimination appears to have increased soon after liberalisation (1993-94) but it has come down by 1999-2000. Nevertheless the raw wage differentials have increased over this period.

We also assessed the relative contribution of each independent variable to the observed wage gap. Table 4 shows which part of the wage gap can be attributed to differences in endowments and which part is due to differences in rewards (discrimination) in the earnings function.

If we look at the total difference column, the proxy for experience – the age variable – was favourable to NSCs in 1993-94, but the result was quite the reverse in 1999-2000. Note that the large contribution of age during 1999-2000 in favour of SC/ST is more than offset by the constant term, which is in favour of FC.

The next important variable is level of education. Secondary/Higher secondary and higher education both favour the FCs. Women are in a disadvantaged situation as the male variable is negative and in favour of SCs. The public sector and union membership variables are rather prominent in their effects on the earnings difference. There is a favourable treatment of SCs in the public sector – SCs gained an earnings advantage of 27.1 per cent in 1993-94 and 9.8 per cent in 1999-2000. The permanent job variable favours FCs. The regional effect on earnings difference is meagre but it favours FCs. Finally there is a large effect of the constant or intercept term that works in favour of the FCs; its contribution increases over time.

When we include occupational variables in our model, the discrimination coefficient is reduced to 24 per cent from 30 per cent in 1993-94, and to 15 per cent from 20 per cent in 1999-2000. This result implies that discrimination partially operates through occupational segregation, which we will study in greater detail in an ensuing section.

### Discrimination in the Public and Private Sectors: Decomposition Results

The reservation system that sets aside a certain proportion of jobs for SC/ST applicants operates only within the public sector of the Indian economy. One important issue, therefore, is to look at caste-based wage inequalities separately for the public and private sectors of the urban economy. We estimated separate earnings functions for the public and private sector for each social group, and then decomposed the earnings differentials between FCs (NSC and/or Others) and SC/ST for each sector. The results are reported in Table 5.

This decomposition in Table 5 reveals that SC/ST workers are discriminated against both in the public and private sector, but that the discrimination effect is much smaller in the public sector. Both in terms of endowment and discrimination, the SC/STs appear to have made no significant change over the two periods (1993-94 and 1999-2000), especially in the private sector. The public sector seems to have accommodated much more SC/ST that are poorly endowed in human capital (low skilled workers), while the private sector has remained more or less exacting in nature as before. Likewise, discrimination seems to be much

more resilient in the private than in the public sector, for the decline is relatively better in the public sector. The government policy of protective legislation seems to be partly effective. Over time the discrimination coefficient has decreased slightly in the public sector, whereas the discrimination coefficient has not changed significantly in the private sector. Discrimination still arises in the public sector in part because the reservation quota for lower caste applicants is close to full in the less-skilled class C and D jobs but is far from filled in the higher category A and B jobs, where higher castes predominate.

These findings have important implications for the public-private divide and for affirmative action in India. The evidence provided by these decompositions contradicts the argument that there is no discrimination in the private sector. Claims that discrimination does not occur in the Indian urban private sector are

**Table 4: Relative Contribution of Specific Variables to the Decomposition**

Variables	1993-94			1999-2000		
	Explained Difference	Unexplained Difference	Total Difference	Explained Difference	Unexplained Difference	Total Difference
Age	0.0	10.8	10.8	3.6	-126.5	-122.9
Less than secondary	-7.4	14.5	7.1	-8.8	2.6	-6.2
Sec/HSC	20.1	11.5	31.6	14.7	4.2	19.0
Higher education	63.6	5.9	69.5	70.3	6.5	76.8
Male	1.1	-46.5	-45.4	1.6	-10.8	-9.2
Married	-1.5	4.8	3.3	0.3	17.3	17.6
Public	-5.9	-21.2	-27.1	-4.9	-4.9	-9.8
Union	-4.5	-0.4	-4.8	-2.9	-8.2	-11.1
Permanent	1.9	10.4	12.3	4.9	2.3	7.2
Region	3.0	-3.3	-0.4	1.3	5.2	6.5
Constant	--	43.9	43.9	---	132.0	132.0
Subtotal	69.6	30.4	100.0	79.6	20.4	100.0

Notes: A positive number indicates advantage to FCs. A negative number indicates advantage to SCs.

**Table 5: Decomposition Results for the Public and Private Sectors**

Components	1993-94		1999-2000	
	Public	Private	Public	Private
Endowment difference	82.0	69.0	86.0	70.1
Discrimination	18.0	31.0	14.0	29.9

**Table 6: Cotton-Neumark-Oaxaca/Ransom Approach – Urban India – 1999-2000 (percentages)**

Components	Cotton/Neumark	Oaxaca/Ransom (Pooled Method)	Oaxaca-Blinder Using SC	Oaxaca-Blinder Using NSC
			Means as Weight	Means as Weight
Skill difference (end difference)	81.8 (0.010214)	85.0 (0.01010)	79.0 (0.01246)	88.1 (0.01038)
Unexplained difference (discrimination)	18.2 (0.010249)	15.0 (0.008235)	21.4 (0.01242)	11.9 (0.010611)
Overpayment to FC	5.2 (0.056734)	4.1 (0.032156)	–	–
Underpayment to SC	13.0 (0.043456)	11.2 (0.023123)	–	–

Notes: (1) Unexplained component = overpayment ± underpayment component. (2) Figures in parentheses indicate standard errors.

based neither on economic theory of discrimination nor on empirical facts.

### Cotton, Neumark and Oaxaca/Ransom Decomposition Results

We calculated decomposition results using the Cotton (1988), Neumark (1988), and Oaxaca and Ransom (1994) approach. These reveal that the wage difference due to skill is 81.8 per cent using Cotton's method and 85 per cent using a pooled method (Oaxaca/Ransom). This skill or productivity advantage is estimated as it would have been in the absence of discrimination. The NSC treatment advantage is 5.2 per cent in the Cotton method and 4.1 per cent in the pooled method. This is the difference in wages between what the FCs currently receive and what they would receive in the absence of discrimination. The treatment disadvantage component for SC/ST is about 13 per cent in the Cotton method and the corresponding figure is 11.2 per cent for the pooled method. This is the difference in the current SC/ST wage and the wage they would receive if there were no discrimination. If we look at Table 6 at the last two columns of the estimates using the Oaxaca method, as expected, the fourth column evaluated at SC/ST means,

somewhat underestimates the true value of the skill difference, whereas the fifth column evaluated at FC means, does the reverse.

This form of the decomposition procedure yields more accurate estimates of the wage differential but it also models the true state of differential treatment by estimating the "cost" to the group discriminated against as well as the "benefits" accruing to the favoured group.

We estimated standard errors for each of the three estimates to determine which of the three was least objectionable. The pooled method has the smallest standard error and should probably be preferred. When this method is used, the discrimination coefficient is somewhat smaller in magnitude (15 per cent), but there is still clear and substantial evidence of discrimination in the labour market against SCs and STs.

### Combining Wage and Job Discrimination: Expanded Decomposition Results

We analysed occupational attainment within the framework of a multinomial logit model. Using the occupation attainment results, a predicted distribution for SCs ( $\hat{P}^{SC}$ ), and for non-scheduled castes ( $\hat{P}^{NSC}$ ) was obtained. The earnings functions by occupation

Table 7: Expanded Decomposition Results – Urban India – 1999-2000

Occupation	Job Explained	Job Discrimination	Wage Explained	Wage Discrimination	Wage Overpayment to NSC	Wage Underpayment to SC/ST
Professional	-0.06206	0.706537	0.014075	0.00456	0.00512	0.016564
Administration	-0.00232	0.249214	0.015555	0.00321	0.00123	0.012567
Clerical	0.049441	0.169439	0.014127	0.01343	0.00033	0.00123
Sales	-0.07005	0.213229	0.002345	0.01527	0.00434	0.017725
Service	-0.11033	-0.66201	0.018874	0.01649	0.00225	0.001123
Production	0.25565	-0.56178	0.015537	0.01474	0.00177	0.003143
Total	0.060324	0.114629	0.080514	0.06771	0.01504	0.052352
(Per cent) to overall raw wage differentials	18.66	35.46	24.91	20.95	4.78	16.17
Overall wage differentials between FC and SC	0.323177					

### Appendix: Descriptive Statistics of Main Variables in the Earnings Function

Variables	Description of the Variables	1999-2000					
		FC		OBC		SC	
		Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
lwage	logarithm of daily wage (in rupees)	4.952815	0.846096	4.603097	0.866684	4.64658	0.826999
Age	Age in years	37.16764	11.00094	35.99369	11.41067	36.53055	11.18109
Agesq	Age square (in years)	1502.448	846.3519	1425.737	861.2629	1459.47	845.4274
Bprim	If the worker has completed below primary education=1; 0 otherwise	0.042584	0.201922	0.06867	0.252905	0.084835	0.278667
Prim	If the worker has completed Primary school=1; 0 otherwise	0.065295	0.247052	0.118916	0.323706	0.134506	0.341232
Middle	If the worker has completed Middle school=1; 0 otherwise	0.13343	0.340046	0.18798	0.390716	0.187033	0.389981
Secon	If the worker has completed secondary school=1; 0 otherwise	0.206962	0.405138	0.219212	0.413733	0.161758	0.368269
Hsc	If the worker has completed higher secondary school=1; 0 otherwise	0.136175	0.342983	0.115172	0.319246	0.094066	0.291953
Grad_Prof	If the worker has completed professional degree=1; 0 otherwise	0.045842	0.209147	0.023744	0.152258	0.00989	0.098967
Grad_Other	If the worker has completed General degree=1; 0 otherwise	0.312887	0.46368	0.162168	0.368623	0.114945	0.318991
Male	If the individual sex is male=1; 0 otherwise	0.835435	0.370796	0.837833	0.368623	0.810989	0.39156
Married	If the individual is married=1; 0 otherwise	0.767255	0.422591	0.72197	0.44805	0.756264	0.429383
Public	If the worker is working in public sector=1; 0 otherwise	0.384558	0.486502	0.309754	0.462415	0.436703	0.496032
Unionmem	If the workers is a member in union=1; 0 otherwise	0.429097	0.494959	0.381084	0.485677	0.464835	0.498817
Permanent	If the workers is having a permanent job=1; 0 otherwise	0.72267	0.447691	0.678325	0.467142	0.658901	0.474131
South	If the individual working in South=1; 0 otherwise	0.188207	0.390886	0.529458	0.499156	0.22	0.414292
West	If the individual working in West=1; 0 otherwise	0.341416	0.474196	0.166108	0.372196	0.285495	0.451699
East	If the individual working in East=1; 0 otherwise	0.127798	0.333873	0.051724	0.22148	0.101978	0.302653
Professional	If the individual's occupation is Professional=1; 0 otherwise	0.222832	0.416156	0.140394	0.347413	0.104615	0.306091
Admn	If the individual's occupation is administration =1; 0 otherwise	0.058175	0.234079	0.025025	0.156208	0.016703	0.128171
Clerical	If the individual's occupation is clerical=1; 0 otherwise	0.233444	0.423032	0.186995	0.389927	0.178681	0.383127
Service	If the individual's occupation is service=1; 0 otherwise	0.093359	0.290941	0.120985	0.326126	0.26022	0.438803
Farmers	If the individual's occupation is farmers, fisherman, etc=1; 0 otherwise	0.007633	0.087032	0.02069	0.14235	0.024396	0.154291
Prodn	If the individual's occupation is Production=1; 0 otherwise	0.278308	0.448176	0.394483	0.488763	0.343956	0.475079

Notes: The occupation is based on one digit national classification of occupation. Professional= professional, technical and related workers, Administration= administrative, executive and managerial workers, Clerical= clerical and related workers, Service= service workers, Farmers= framers, fishermen, hunters, loggers and related workers, Production= production-related workers, transport equipment operators and labourers.

are needed to complete the decomposition based on the full model. Table 7 reports a decomposition of the actual earnings difference into its skill difference, an overpayment to NSC and an underpayment to SC.

Of the gross wage difference, 24.9 per cent can be explained by education and experience, 18.6 per cent by occupational difference, 20.9 per cent by wage discrimination, and 35.4 per cent by occupational discrimination. Thus, discrimination accounts for a large part of the gross earnings difference, with job discrimination (inequality in access to certain occupations) being considerably more important than wage discrimination (unequal pay within a given occupation, given ones educational and skill level) in the regular salaried urban labour market. This result is contrary to an earlier study in India by Banerjee and Knight (1985). However, their study focused on migrant workers in Delhi, a small sample compared to our nationwide survey.

### III Concluding Observations

To estimate the earnings differences attributed to discrimination, we estimated an augmented Mincerian earnings function separately for NSCs (OBCs and Others) and SC/STs in the regular/salaried labour market. The estimated earnings function shows that the rates of return to education for SC/STs are considerably lower than for NSCs. Our decomposition analysis showed that a major share of the earnings differential between NSCs and SC/STs is due to differences in human capital endowments, but while about 15 per cent is due also to discrimination in the marketplace. Our analyses also revealed that occupational discrimination is more pronounced than wage discrimination. The major policy implications of our findings are discussed as follows.

The size of the education and other endowment differences between SC/STs and FCs indicate the need for continued government policies aimed at education and skill building for the SCs. The reservation system has clearly helped in this regard but additional policies should be considered including additional scholarship support and reduced tuition for poor students.

Our findings have shown that employment discrimination is substantial, especially in the private sector, and that discrimination occurs to a large extent in unequal access to jobs. An equal employment opportunity act would provide legal protection against discrimination in hiring, and a reservation system with a certain fixed share in certain categories of jobs would ensure the fair participation of marginalised groups in industrial/tertiary private sector employment. To bring transparency and to monitor the programme requires some administrative mechanism. An Equal Employment Enforcement Office, along the lines of those in the US and Northern Ireland would be desirable. [EW](#)

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### Notes

- 1 This approach allows only the intercept to vary by caste, but not the slope. In order to overcome this problem, we present earnings functions separately by caste.
- 2 See Mincer (1974) for a discussion of labour market earnings functions.
- 3 See Madheswaran (2007), for a comparative analysis of the data for the years 1983 and 1993-94.

### References

- Banerjee, B and J B Knight (1985): 'Caste Discrimination in the Indian Labour Market', *Journal of Development Economics*, 17: pp 277-307.
- Blinder, A S (1973): 'Wage Discrimination: Reduced Form and Structural Estimates', *Journal of Human Resources*, 8, pp 436-55.
- Brown, R S, M Moon and B S Zoloth (1980): 'Incorporating Occupational Attainment in Studies of Male/Female Earnings Differentials', *Journal of Human Resources*, 15, pp 3-28.
- Cotton, C J (1988): 'On the Decomposition of Wage Differentials', *Review of Economics and Statistics*, 70, pp 236-43.
- Duraisamy, P (2002): 'Changes in the Returns to Education in India, 1983-94: By Gender, Age-Cohort and Location', *Economics of Education Review*, 21(6), pp 609-22.
- Dutta, P V (2004): 'Structure of Wages in India', PRUS Working Paper No 25, University of Sussex, UK.
- Foster, A D and M R Rosenzweig (1996): 'Technical Change and Human-Capital Returns and Investments: Evidence from the Green Revolution', *American Economic Review*, 86(4), pp 931-53.
- Greenhalgh, C (1980): 'Male-Female Differentials in Great Britain: Is Marriage an Equal opportunity?' *Economic Journal*, 90, pp 751-75.
- Gundersen, M (1989): 'Male-Female Wage Differentials and Policy Responses', *Journal of Economic Literature*, 27, pp 46-117.
- Kijima, Yoko (2006): 'Why Did Wage Inequality Increase? Evidence from Urban India 1983-89', *Journal of Development Economics*, Vol 81, pp 91-117.
- Kingdon, G G (1998): 'Does the Labour Market Explain Lower Female Schooling in India?' *Journal of Development Studies*, 35(1), pp 39-65.
- Labour Bureau (various years): Indian Labour Statistics, Labour Bureau, Ministry of Labour, Government of India.
- Madheswaran, S (1996): 'Econometric Analyses of Labour Market for Scientists in India', unpublished PhD thesis, University of Madras.
- Mincer, J (1974): *Schooling, Experience and Earnings*, Columbia University Press, New York.
- Moll, P (1992): 'The Decline of Discrimination against Coloured People in South Africa, 1970-1980', *Journal of Development Economics*, 37, 289-307.
- (1995): 'Discrimination Is Declining in South Africa, but Inequality Is Not', mimeo, Chicago.
- National Sample Survey Organisation (2001): 'Employment and Unemployment Situation in India, NSS 55th Round, 1999-2000 – Part 1', Ministry of Statistics and Programme Implementation, Government of India, New Delhi.
- (2001): NSS Report No 469: 'Employment and Unemployment among Social Groups India', 1999-2000.
- (2001): NSS Report No 472: 'Differences in Level of Consumption among Socio-Economic Groups', 1999-2000.
- (2001): NSS Report No 473: 'Literacy and Levels of Education in India', 1999-2000.
- Neumark, D (1988): 'Employers Discriminatory Behaviour and the Estimation of Wage Discrimination', *Journal of Human Resources*, 23, pp 279-95.
- Newell, A and B Reilly (1999): 'Rates of Return to Educational Qualifications in the Transitional Economies', *Education Economics*, 7(1), pp 67-84.
- Oaxaca, R L (1973): 'Male-Female Wage Differentials in Urban Labour Market', *International Economic Review*, 14, pp 693-709.
- Oaxaca, R L and M R Ransom (1994): 'On Discrimination and the Decomposition of Wage Differentials', *Journal of Econometrics*, 61, pp 5-21.
- Reimer, C W (1983): 'Labour Market Discrimination against Hispanic and Black Men', *Review of Economics and Statistics*, 65, pp 570-79.
- (1985): 'A Comparative Analysis of the Wages of Hispanic, Blacks and Non-Hispanic Whites' in G J Borjas and M Tienda (eds), *Hispanics in the US Economy*, Academic Press, New York.
- Thorat, S K (2005): *Reservation Policy for Private Sector: Why and How*, Sugava Prakashan, Pune.
- Weisskopf, T E (2004): 'The Impact of Reservation on Admissions to Higher Education in India', *Economic and Political Weekly*, September 25.

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