

DOES CASTE MATTER FOR WAGES IN THE INDIAN LABOR MARKET?

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Abstract

This paper explores whether pay gaps on the basis of caste are still evident in the Indian labor market using data from the most recent round of the nationally representative National Sample Survey. Caste in India is the primary source of stratification. The hypothesis is that the hierarchical nature of the caste system and the strong association of ritual purity with different occupations translate into poorer labor market outcomes, including occupational segregation and wage discrimination. Separate wage equations, corrected for selection bias, are estimated for different social groups (scheduled castes, other backward castes and general castes) in regular and casual wage employment. Conventional index number techniques are used to decompose the caste pay gap into 'endowment' and 'treatment' components. The empirical evidence in this paper suggests that caste is still a determining factor in how individuals are remunerated in the wage labor market. Amongst regular workers the extent of the wage gap is substantial at about 0.37 log points, of which between a third is attributable to unequal treatment of scheduled caste workers relative to general caste workers, depending on whether selection into regular wage employment is taken into account. The wage gap among casual workers, as expected, is very low and almost entirely accounted for by differences in characteristics.

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Does caste matter for wages in the Indian labor market: Caste pay gaps in India

Despite highly impressive growth rates and low levels of *income* inequality India's exclusionary social structures continue to place obstacles for several groups in access to key opportunities. Of these the most abiding structure is the caste system, believed to be responsible for major inequalities in access - in as diverse areas as education, health, technology, and jobs. There are also continuing instances of "atrocities"¹ against Scheduled Castes (SCs) and Scheduled Tribes (STs)² and women in spite of frequent public outcry and political resistance. The role of caste in the labor market is of particular salience since caste is founded on an occupational division of labor, with Brahmins engaged in intellectual and priestly pursuits, Kshatriyas in martial pursuits, Vaishyas in trading and Shudras in stigmatized manual occupations. An elaborate ideology of purity and pollution of occupations provides the rationale for the existence of this division of occupations.

Caste in India therefore is the primary source of stratification and responsible for a host of outcomes even after controlling for other factors. Thus, poverty rates, educational endowments, "entrepreneurial wherewithal" are all lower among SCs and STs. In addition, their access to land - the primary marker of status, in addition to being a key asset - is also low. Finally, individuals from certain castes are routinely subjected to indignities and social censure despite rising rates of urbanization and development, which we would expect would have wiped out such discrimination. The reason why caste is so important for labor markets is that it has at once a ritual and an occupational logic. Thus, strict rules of dining and marriage, based on ritual purity and pollution, governed the relations between castes, and an equally strict division of labor meant that historically certain castes or sub-castes only undertook certain occupations.

Social status was also commensurate with economic and political power. Although this has changed dramatically over the past millennium, caste still remains at the crux of social stratification with consequences for other outcomes in India. Recent evidence on low mobility in the Indian labor market finds significant effects of caste based occupations (Munshi & Rosenzweig, 2005). Though there is strong body of sociological and anthropological literature on caste in India, economic theoretical models incorporating caste in the labor market are few (see for example, Akerlof 1984; Platteau 1995; Scoville 1996; and Thorat and Deshpande 1999). However, there is now a modest but rapidly growing empirical literature on the economic implications of the caste system relating to caste inequalities in educational attainment (Borooah and Iyer 2005; Hoff and Pandey 2006), in earnings (Banerjee and Knight 1985; Lakshmanasamy and Madheswaran 1995; Unni 2001; Das 2005), living standards (Saagar and Pan 1994; Gang et al 2002), and social and economic mobility (Rao 1992; Chandra 1997; Munshi and Rosenzweig 2006)³. However, almost all these studies, other than Unni (2001) and Gang et al. (2002), focus on specific regions or communities. In addition, a set of empirical papers providing evidence of significant discrimination in the urban formal labor market have recently been published (see Jodhka and Newman 2007 and Thorat and Attewell 2007 for discrimination in hiring practices; see Deshpande and Newman 2007 and Madheswaran and Attewell 2007 for discrimination in earnings).

¹ Term drawn from a law to protect traditionally excluded castes against caste-based crimes and indignities.

² These terms, "Scheduled Caste" and "Scheduled Tribe", are derived from a government schedule for positive discrimination for these groups. In recent years, the more politically correct terms Dalits (self-described Shudras translating into "the oppressed people") and Adivasis are increasingly being used.

³ See Deshpande (2001) for a survey of some of these studies.

Affirmative action. Since the roots of discrimination against SC/STs lay in the traditional caste-based stratification system, the Constitution of independent India facilitated reservation of seats in public employment and educational institutions, broadly proportionate to their representation in the population. Thus, Scheduled Castes have a 15 percent and Scheduled Tribes a 7.5 percent reservation in all public educational institutions and government or quasi-government jobs (which form the major part of all regular salaried jobs). In addition, in 1991, these quotas were extended to Other Backward Castes (OBCs) as well.⁴ There is also a relaxation of age bars and exemption of application fees for these groups. Some states have set up special cells to provide information and coaching services to SC and ST candidates, to enable them to succeed in the competitive examinations crucial to obtaining government jobs. More recently, in a move that was viewed controversially by the private sector, the Prime Minister encouraged the private sector to recruit more SC and ST candidates.

It is generally accepted that these quotas have been successful in helping historically marginalized groups find a space in the public arena. However, there are also concerns that elites within these groups have monopolized the gains in employment. The historically most disadvantaged castes (within SCs) still continue to be among the poorest and the most excluded from lucrative and high status employment (Thorat and Deshpande, 1999). Traditional caste patterns are often seen replicated in the entry of SCs into the public sector workforce. Thus, the fact that over 65 percent of sweepers in central government ministries are SCs (Das 2005) indicates that SCs are more likely to undertake “ritually unclean” and manual work. Also, several government establishments are unable to fill the jobs reserved for SCs and STs, often on grounds of lack of suitable candidates. This is a politically volatile subject and unions of SCs and STs within government establishments have on their part sought to further the interests of their constituencies and lobby for filling these vacancies. There is some anecdotal evidence of SC/ST groups acting as rent-seekers and monopolizing certain categories of government jobs that are seen as traditional occupations for these groups. Kishwar (2001) reports that when hawkers in Delhi were provided a space of their own, municipal sweepers came to extract bribes because they were being deprived of sweeping.

To summarize, there are three ways in which caste affects labor markets and in which the Indian situation is distinct from other countries:

- Caste as an occupationally ordered system –so certain castes are historically typed into certain occupations and evidence from micro-studies indicates that at the low ends, there is social sanction against moving out of those occupations. Combined with the fact that lower castes also have disproportionately low educational endowments, the opportunities for them to rise out of manual occupations are further limited.
- One of the most significant labor market policies in India is that of caste based reservations in jobs that until recently have been the most highly coveted – regular salaried work in the public sector. Preferential treatment for SC/STs in other areas (such as age relaxation, waiver of application fees etc.), as well as quotas for SC/STs in public employment works has also had a bearing on labor markets.

⁴ OBCs are not strictly comparable to SCs and STs and in terms of their access to assets and endowments, they fare better than SCs and STs, sometimes comprising the dominant castes at the village or even state level.

- High poverty rates among SC/STs and lower restrictions on mobility and public appearance have meant that women among SC/STs have had higher labor force participation rates than other women.

In short, the hierarchical nature of the caste system and the strong association of ritual purity with different occupations translate into impermeable and permanent barriers to equitable access to opportunities. This, in turn, translates into poorer labor market outcomes. Therefore, important to this analysis is the question – with Constitutional acceptance of the exclusion of SCs – self-described Dalits translating into “the oppressed people” – and a range of policies and programs in place to bring them on par with non-SCs, have pay-gaps on the basis of caste shrunk or disappeared? Or is caste still a determining factor in how individuals are remunerated in the wage labor market? This paper addresses this question using data from the most recent round of the nationally representative National Sample Survey. In doing so, this paper adds to the surprisingly thin body of empirical literature on the correlation between caste and labor market outcomes.

A. Discrimination and the labor market

Theories of discrimination explaining different labor market outcomes have been developed mostly in the context of gender and race (see for example Arrow 1973, Becker 1957, 1971). The notion of discrimination in the labor market encompasses “restrictions (formal and informal) on the entry of subordinate groups to the market and/or through selective inclusion with unequal treatment. Labor market discrimination can transpire in the domain of hiring, or in wages, or through working conditions, and opportunities for upward mobility” (Thorat and Newman 2007, pp. 4122). One distinguishing feature of caste-based discrimination is that, unlike race or gender, it is not necessarily practiced by one dominant group over a well-defined subordinate group. Caste is less easy to identify than either race or gender and the SC group is quite heterogeneous. More importantly, all groups are aware of and to some extent perpetuate the caste hierarchy – for instance, even within all scheduled castes, some sub-castes would be more dominant than others while sub-castes like *chamars* are unambiguously at the bottom of the social hierarchy.

One strand of the literature on the economics of discrimination predicts discrimination at the hiring stage that then translates into lower earnings (Arrow 1973). For instance, in the presence of imperfect information, employers may be unable to accurately assess the quality of other-caste workers. As a result, employers may offer higher wages and higher positions to same-caste workers (see also Phelps 1972). Thus, in the presence of incomplete information, employers may screen candidates on the basis of perceived differences in productivity. As a result, SC workers must have lower reservation wages in order to compete with otherwise observationally identical groups. There is some evidence of discrimination in hiring practices in the urban formal labor market in India. For instance, Thorat and Attewell (2007) find, in a field experiment, that low caste and Muslim applicants find it harder to pass through hiring screens set up by employers. Similarly, Jodhka and Newman (2007) find, through interviewing human resource managers on the hiring practices of their firms, that caste-based stereotypes do color the hiring process so that very low caste and very high caste candidates are disadvantaged. It is possible that such caste-based stereotyping with respect to productive characteristics are unconscious, in which case discrimination may not be overtly evident in hiring practices. Instead, it may be manifest in the interaction between employer and job applicant (e.g., detailed enquiries about “family background”) which may result in a SC worker withdrawing from the job queue.

It should be noted that only screening based on subjective criteria such as stereotypes of caste identities would be classified as discrimination; that based on correctly perceived differences in productivity would not be so classified. However, there is a possibility that employer perceptions of caste-based differences in productivity are proved correct only because they are self-fulfilling. For instance, low levels of on-the-job training, poorer work conditions, lack of responsibilities and perceived promotional opportunities, and/or lower wages for SC workers may result in lower productivity among these workers (Banerjee and Knight 1985).⁵ There is some experimental evidence of a significant negative impact of announcing caste identities on test scores of SC children who otherwise performed at par with their peers (Hoff and Pandey 2006).

A second strand of this literature deals with segmented markets. For instance, Becker (1957) predicts the segregation of workers into sub-economies as a result of discrimination in perfectly competitive product and labor markets. Within these sub-economies, however, workers with identical characteristics receive equal wages (as the model assumes constant returns to scale). However, wage differentials between observationally similar workers could arise if product and/or labor markets are imperfect so that rents are shared with workers in the form of higher wages or efficiency wages are paid to workers resulting in wage premia across industries, occupations and firms. Thus, the caste system segregates workers into occupations so that SC workers are crowded into low-paid occupations/jobs as described in the previous section. In particular, this has implications for matching workers to traditional occupations based on caste identities or at least an allocation of SC workers to jobs that do not threaten the caste hierarchy within the organization (Banerjee and Knight 1985). This is further exacerbated by informal referral systems that often mediate access to jobs (see for example Iversen and Raghavendra 2006, Munshi and Rosenzweig 2005). As a result, mean earnings for SC workers are likely to be lower than that of upper caste groups.

In addition, employers and firms may practice a ‘taste for discrimination’ based on different market valuations of group-specific characteristics (Arrow 1973, Becker 1971). As a result, wage differentials would arise in the presence of such discriminatory practices on the part of employers and similar workers doing the same job would be paid differently depending on their social group. In addition, if good jobs are in short supply and rationed, in the presence of discrimination, employer preference will be for upper caste workers. Again, SC workers would be streamed into low-wage firms/jobs while upper caste groups capture high-wage firms/jobs.

The sociological literature on segmented labor markets tends to focus on the importance of social relationships in driving labor market segmentation. Dual market theories for which Doeringer and Piore (1971) became most famous, talk of primary and secondary markets – the first being highly coveted with better wages and the second comprising workers who are discriminated against and who get lower pay and worse conditions of work. Thus, while economic theories see differences in labor market outcomes between different groups as arising from the marginal commitment to the labor market that such groups might have – for instance, women’s lower commitment compared to men’s – sociological theories attempt to get to the social dynamics that lead to primary and secondary markets.

At the core of labor market segmentation are social groups and institutions. The processes governing allocation and pricing within internal labor markets are social,

⁵ Historic discrimination may also result in lower expectations and aspirations – both with respect to the nature of occupations and earnings (Banerjee and Knight 1985). Given the growing swell of the Dalit rights movement and the recent rise of caste-based groups in the political arena, this explanation is less likely to hold true.

opposed either to competitive processes or to instrumental calculations. The marginal labor force commitment of the groups which creates the potential for a viable secondary sector of a dual market is social. The structures which distinguish professional and managerial workers from other members of the labor force and provide their distinctive education and training are also social. - Piore, 1983:252

Applying some of these theories to caste and the Indian labor market, we find that there is some evidence of SC workers earning significantly less than non-SC workers in the formal urban labor market, even after controlling for observable worker characteristics (Madheshwaran and Attewell 2007). Differences in access to occupations are likely to be an important cause driving differences in earnings by caste, particularly since even within broad occupational categories, SC workers are likely to be employed at the least-skilled, least-paid, manual and casual jobs. At the same time, however, there is some evidence that the earnings differentials between otherwise similarly qualified workers exists even among highly qualified professional graduates from elite universities, possibly due to weaker connections in the formal labor market (Deshpande and Newman 2007). This suggests that both occupation (job) and wage discrimination have a role to play. This paper investigates the second issue by estimating the size of the wage differential between SC and non-SC workers and the extent to which this can be attributed to unequal treatment of SC workers.

B. Methodology and data

Methodology

This paper presents estimates of the mean caste wage gap in the Indian labor market and the extent to which this differential can be explained by differences in endowments of workers from different caste groups. Our estimates exclude STs for conceptual and empirical reasons. Conceptually and according to the rules of caste stratification, STs do not belong within the caste hierarchy and as such the occupational logic of caste does not strictly apply. Empirically, ST households and workers possess distinct features from SC households and workers. The large majority of ST households own at least subsistence land and so, when they cannot get benefits from job quotas, either due to lack of education or due to lack of access to information about vacancies, or due to the fact that these vacancies remain unfilled, they have subsistence agriculture to fall back on. As a last resort, they end up as casual laborers.⁶ While the wages of ST casual workers are the lowest among all social groups, those of ST regular workers are at par with or higher than even OBC workers. However, this unexpectedly high wage is driven primarily by ST workers in administrative jobs, where these workers earn almost at par with general caste workers. Given the predominantly agrarian focus of ST households, our explanation for this is that such a small proportion of STs are actually in wage employment that it is the elite (or so-called “creamy layer”) amongst them that the wage data capture. These are STs who have over successive generations availed of the benefit of reservations and have now achieved success in their respective areas. So as not to confound the analysis between these distinct groups of workers, we chose to focus on SC workers in this paper.

The mean caste wage gap. Following the standard labor economics literature, wage regression models are estimated using augmented Mincerian earnings equations controlling for human capital and various other characteristics. In the approach adopted for this study, separate wage

⁶ This is very different from the situation of SC households that have very little access to land and are over-represented in casual wage employment and under-represented in self-employment.

determination processes are specified for workers from different social groups – SC, OBC and general castes – engaged in wage employment.

$$w_{si} = \mathbf{X}'_{si} \mathbf{b}_s + m_{si} \quad (1)$$

$$w_{gi} = \mathbf{X}'_{gi} \mathbf{b}_g + m_{gi} \quad (2)$$

The subscripts s and g denote the social groups, where s stands for scheduled caste (SC) or other backward caste (OBC) and g stands for general caste (GC). w_{ji} and \mathbf{X}_{ji} represent respectively the log hourly wage and the $k \times 1$ vector of observable characteristics for individual i who belongs to social group j , where $j = s$ (SC, OBC), g (GC). \mathbf{b}_j vectors are $(k \times 1)$ vectors of unknown wage equation parameters; m_{ji} is $(n \times 1)$ vector of random error terms.

The conventional Oaxaca (1973) methodology is used to decompose the average caste wage gap between each of the social groups (SC and OBC) relative to the general caste category using the OLS estimation of social group-specific wage equations:

$$\bar{w}_g - \bar{w}_s = (\bar{X}_g - \bar{X}_s)' \hat{\mathbf{b}}_g + \bar{X}_s' (\hat{\mathbf{b}}_g - \hat{\mathbf{b}}_s) \quad (3)$$

Here, the ‘bars’ denote mean values for the social group-specific wage determining characteristics and the ‘circumflexes’ denote OLS estimates. The overall average differential in wages between each pair of social group can be decomposed into a part attributable to differences in characteristics (as evaluated at the general caste worker returns), a part attributable to differences in the estimated relationship between each of the social groups (SC and OBC) relative to the general caste category (i.e., the social group differences in returns) evaluated at the mean set of SC or OBC characteristics.⁷ The first component is generally referred to as the ‘endowment’ or ‘explained’ effect and the second as the ‘treatment’ or ‘unexplained’ (or residual) effect. The ‘treatment’ component is taken to provide an average estimate of the caste wage gap adjusted for characteristics and is sometimes taken to partly reflect the effect of post-entry ‘discrimination’ in the labor market. However, part of the ‘endowment’ component could also capture unequal caste treatment in terms of pre-entry to the labor market, e.g., with respect to lower educational attainment of SC workers relative to GC workers. The computation of sampling variances for the ‘endowment’ and ‘treatment’ components is relatively straightforward given their linearity in terms of the coefficient estimates:

$$\text{Variance of endowment effect: } Var_{treatment} = (\bar{X}_g - \bar{X}_s)' V(\hat{\mathbf{b}}_g) (\bar{X}_g - \bar{X}_s) \quad (4)$$

$$\text{Variance of treatment effect: } Var_{endowment} = \bar{X}_s' (V(\hat{\mathbf{b}}_g) + V(\hat{\mathbf{b}}_s)) \bar{X}_s \quad (5)$$

Selection correction. The problem of selectivity bias, as mediated through either participation or selection into wage employment, may be an issue. There is some evidence of non-random selection into wage employment in India (see Duraisamy, 2002; Kingdon and Unni 2001; Dutta

⁷ The use of the ‘index number’ approach is subject to the conventional ‘index number’ problem. It is clear that expression (3) could be re-computed using the set of ST, SC or OBC coefficients and the ‘treatment’ effect is derived using the ‘basket’ of average GC characteristics. The interpretation of all three terms remains the same but their numerical values may differ. Alternative procedures that are insensitive to this problem have been developed (see Cotton 1988 and Neumark 1988). However, given the emphasis in our study, these procedures are not pursued here.

2006).⁸ The issue of wage equation selection bias is addressed here using the generalized framework popularized by Bourguignon et al (2004). Selection is modeled as a polychotomous outcome between three employment categories – non-wage earners (including non-participants in the labor market, self-employed and unemployed individuals), regular wage workers and casual wage workers. As this study focuses on the bias as mediated through observed wages, it is sufficient and computationally more convenient to separate employment status into non-wage earners and two different types of wage earners. The separation of workers based on the nature of employment is based on the notion of a dual economy; there is some evidence that the formal-informal dichotomy is better characterized by these employment categories in India (Unni 2001; Dutta 2006).

The mean regression models are then estimated as follows:

$$w_{si} = \mathbf{X}'_{si} \mathbf{b}_s + \mathbf{g}_s \hat{\mathbf{I}}_{si} + \mathbf{m}_{si} \quad (1')$$

$$w_{gi} = \mathbf{X}'_{gi} \mathbf{b}_g + \mathbf{g}_g \hat{\mathbf{I}}_{gi} + \mathbf{m}_{gi} \quad (2')$$

Where \mathbf{g}_j are the unknown selection parameters (one for each social group) and $\hat{\mathbf{I}}_{ji}$ is the estimated standard selection variable for the j social group computed using a variant of the Dubin-McFadden (1984) selection correction method using estimates from social-group specific multinomial logit models (see Bourguignon et al 2004).⁹

The identification of the selection effects is crucial. In the context of the current application this requires a set of variables that influence employment status but not the wage. In this paper, the identification of the selection effect is explored using household structure variables typically used in the literature (i.e., number of children, the number of persons older than 65 years in the household, household size and land owned).

The mean caste wage gap can then be decomposed as follows:

$$\bar{w}_g - \bar{w}_s = [\bar{\mathbf{X}}_g - \bar{\mathbf{X}}_s]' \hat{\mathbf{b}}_g + \bar{\mathbf{X}}_s' [\hat{\mathbf{b}}_g - \hat{\mathbf{b}}_s] + [\hat{\mathbf{q}}_g \bar{\mathbf{I}}_g - \hat{\mathbf{q}}_s \bar{\mathbf{I}}_s] \quad (3')$$

In this case, the overall average differential in wages between each pair of social groups can be decomposed into the ‘endowment’ and ‘treatment’ effects exactly as before (equation (3)) but with an additional part that is attributable to social group differences in selection.¹⁰

It should also be noted that there are reservations about the use of selection correction methods even in mean regression models (e.g., Manski 1989 argues that the Heckman procedure lacks robustness and is sensitive to identification, see also Puhani 2000). Given the additional complications associated with the estimation of regression models with selection correction and,

⁸ The bulk of the adult labor force in India is self-employed. These self-employed individuals cannot be included in our regression models due to lack of data on their earnings. If the selection of individuals into wage employment is systematic, ignoring the non-random nature of the sample would introduce a selection bias in the wage regression model's estimates.

⁹ Monte Carlo simulations suggest that this method is preferred to other methods (such as those suggested by Lee and Dahl) to correct for selection bias in such models with polychotomous outcomes (Bourguignon et al 2004).

¹⁰ The selection effects could be netted out of the overall caste wage gap resulting in a caste wage offer gap (see Reimers 1983 for an application in the context of the gender wage gap).

in particular, the difficulties of finding appropriate identifying variables, we present results both with and without selection correction.

Data description

This paper uses the most recent large-scale employment survey conducted by the National Sample Survey Organisation (NSSO) during July 2004–June 2005 (also referred to as the 61st NSS round). This survey provides comprehensive national coverage and has a wealth of information on numerous socio-economic issues at the household and individual level. The sample used in this paper covers both rural and urban areas and is restricted to working age men and women aged between 20 and 65. The sample of individual workers was divided into three mutually exclusive categories based on the household social group: (i) scheduled caste, (ii) other backward castes, and (iii) other castes.¹¹ We exclude ST workers from the analysis as explained in the previous section. Within each of these groups, wage regression models and caste wage gaps are estimated separately for the (i) informal sector and (ii) formal sector, after controlling for selection bias. In this paper, informality is defined with respect to the nature of the job contract so that, in the waged labor market, casual workers constitute the informal sector and regular workers the formal sector.¹² Given the job reservation policy in government or quasi-government jobs, it would have been informative to compare wage gaps between regular workers in the public and private sector. However, the data does not permit a neat division of workers into these two categories, particularly in the case of workers employed in public or private limited companies in the factory sector (see also Glinskaya and Lokshin 2005 for details). For the purposes of correcting for selection, the base sample within each of the social groups was divided into three mutually exclusive categories using current weekly status: (i) formal sector workers (i.e., regular wage earners), (ii) informal sector workers (i.e., casual wage earners) and (iii) non-wage earners, i.e., non-participants in the labor market, self-employed and unemployed individuals.

For those in wage employment, nominal weekly wages include payments in cash and kind.¹³ It is important to take into account variation in weekly wages arising due to variation in hours worked, especially for casual workers. However, the employment surveys do not have data on the hours worked, instead there is information on the intensity of work for each day of the week preceding the survey. This variable takes on one of three values – no work, part-time (if worked between one and four hours during the day) or full-time (if worked more than four hours during the day). The number of hours worked each day is coded zero if no work, four hours if part-time work and eight hours in full-time work reported for that day. This is then aggregated for all seven days to obtain a measure of hours worked in the week. The hourly wage is constructed by dividing the weekly wage by the number of hours worked per week. While a reported hourly wage variable would have been ideal this is the best data available to us and we believe that the possible measurement error introduced by using this constructed variable is less serious than would ensue if we ignored the variation in hours worked altogether, especially for casual workers.

¹¹ In the absence of information on individual caste affiliation, we assume that all household members belong to the same social group. Given the evidence on barriers to inter-caste marriages, this is a defensible assumption.

¹² See also Unni 2001 and Dutta 2006.

¹³ Some observations had to be dropped from the sample as there were missing observations on wages, hours worked and industry affiliation. It is assumed that the excluded observations are random as the mean observable characteristics of the workers excluded do not differ significantly from those retained in the sample though this does not take possible differences in unobservables into account. In this paper, we do not trim the wage distribution following Bollinger and Chandra (2005) who highlight the potential dangers associated with both procedures and emphasize their potential for exacerbating coefficient bias.

In the wage regression models, due to data limitations, age is used as a crude proxy for labor force experience. Marital status is a dummy variable coded one if currently married and zero if never married, widowed, divorced or separated. There is information on the highest level of schooling completed (but not on the number of years of schooling) so dummy variables corresponding to the following education variables were constructed: literate (but have less than two years of formal or informal schooling), primary school, middle school, secondary school and graduate and above. The reference category is individuals who are illiterate. Dummy variables for religious affiliation were constructed from household data; the omitted category is Hindu households. Seasonality effects are captured by dummy variables for the quarter in which the households were interviewed. These quarterly dummies were also interacted with the dummy variable for the rural sector. Dummy variables for industry affiliation were constructed based on the individual's current weekly industrial classification by aggregating to the one-digit National Industrial Classification code (NIC 1998). Similarly, dummy variables for occupational attachment were constructed by aggregating the current weekly occupation classification into one-digit National Classification of Occupation (NCO 1968).

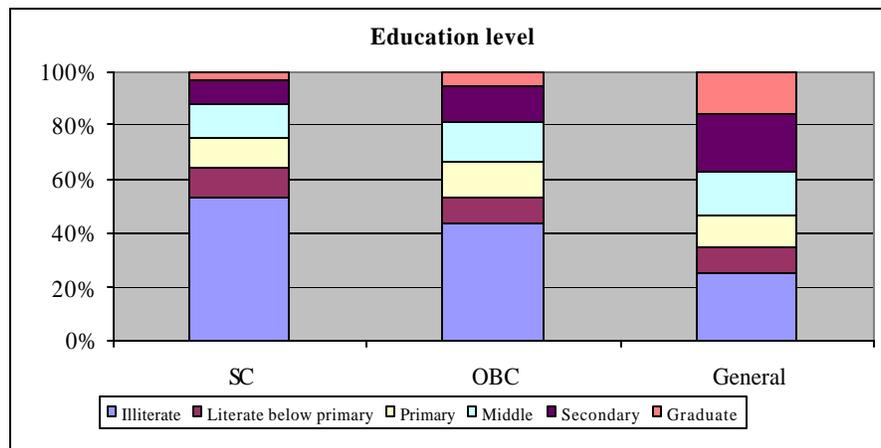
C. Caste and the labor market

This section explores the implications of caste for the labor market empirically through the descriptive results. In the process, this section provides the key arguments for the multivariate analysis reported in the next section. As discussed earlier, the hierarchical nature of the caste system and the strong association of ritual purity with different occupations translate into barriers to equitable access to opportunities.

Low endowments. Caste-based stratification translates into low endowments of human capital and material resources for individuals and households belonging to castes at the bottom end of the social hierarchy. For instance, the literacy rate for SC individuals is 46 percent compared to 75 percent among general caste individuals (see Figure 1).¹⁴ The differences at lower levels of education – below primary and primary – are less pronounced across social groups, but start to diverge widely by middle school. Only 4 percent of SC individuals are graduates compared to 16 percent general caste individuals. There are also concerns about the quality of schooling (either through access to lower quality schools or discrimination within schools) and hence on the learning outcomes of children received by children from different castes (see for example Hoff and Pandey 2006 for an experimental study on the effect of caste on learning achievement).

¹⁴ This difference is starker than that obtained from the 2001 Census, where nationally, literacy rates among SC households is 55 percent compared to 65 percent for the entire population.

Figure 1: Educational attainment by social group, 2004/05



Source: NSSO 61st round Schedule 10. See Data section for details.

Note: All figures in this paper relate to prime-age adults (aged 20 to 65 years).

SC households have historically been landless and therefore their ownership of a key asset is severely limited. For instance, rural SC households own about 0.35 acres of land on average, compared to 0.88 acres among OBC households and 1.01 acres among general caste households. In rural areas, 84 per cent of cultivating SC households are marginal farmers compared to only 62 per cent of general caste households (see Table 2). Similarly, at the top end of the land distribution, only 5 per cent of SC households are medium or large farmers. The corresponding figures for OBC and general caste households are 12 and 16 per cent respectively. Another recent analysis finds that land ownership has an impact not only to allocation of individuals to farm-based self-employment, but also to non-farm self-employment (Das, 2007). Land ownership, aside from being the primary asset in rural areas, is also a key marker of social status.

Table 1: Size of land holding in rural areas, by social group, 2004/05

| | SC | OBC | General | Total |
|----------------------------|-----|-----|---------|-------|
| Marginal farmers | 84 | 69 | 62 | 68 |
| Small farmers | 11 | 19 | 22 | 19 |
| Medium and large farmers | 5 | 12 | 16 | 12 |
| All cultivating households | 100 | 100 | 100 | 100 |

While it is possible that urban areas offer greater opportunities for escaping caste-based identities and occupations compared to rural areas, there is some anecdotal evidence to suggest that caste-based networks continue to exist and function even in cities. For instance, Iversen and Raghavendra (2006) find that SC workers in South Indian eating places in Mumbai and Bangalore still find it necessary to hide their identity in order to minimize workplace conflicts and also in order to compete for jobs. Similarly, Munshi and Rosenzweig (2005) find evidence of reliance on informal referrals, often through caste networks, in mediating access to unskilled jobs in Mumbai, which in turn even influences educational choice. At the same time, it is possible that, labor market referral networks that enables access to jobs in urban centers are more inclusive (often including others from different *jatis* but from the same village) (see Munshi 2003).

Employment status. The hierarchical nature of the caste system combined with low endowments of human and physical capital implies that a far larger proportion of SC individuals have no option but to engage in casual labor – a quarter of SC individuals compared to 8 percent of general caste individuals (see Table 2). In common with other recent studies, we use the type of

work contract as the indicator of informality of an individual's employment. Thus, both casual wage workers and the self-employed can be categorized as subsets of the informal labor market. They are highly heterogeneous categories and include multiple economic activities but for the most part mean low earnings, unstable employment contracts and little or no social security benefits. Regular wage employment, on the other hand, is the formal labor market, with higher pay and better conditions of work.¹⁵ Though these high wages reflect at least in part the returns to the higher skill endowments of these workers, redundancy (especially in the public sector) suggests the presence of rents. Regular workers are also covered by labor market regulations that confer some measure of employment security and social security benefits.

Table 2: Employment status by social group, 2004/05

| | SC | OBC | General | Total |
|--------------------|----|-----|---------|-------|
| Self-employment | 28 | 41 | 37 | 38 |
| Regular employment | 9 | 9 | 14 | 10 |
| Casual labor | 29 | 16 | 8 | 17 |
| Unemployment | 3 | 3 | 3 | 3 |
| Not in labor force | 30 | 32 | 38 | 33 |

Source: NSSO 61st round Schedule 10. See Data section for details.

A recent analysis also using the same data shows that educated SC men have an advantage in the low-end formal public sector jobs – ones that require primary education. But a system of rationing seems to deter their entry into higher level jobs. Perhaps once reserved quotas are filled up (especially for Group A, B and C government jobs) SC candidates have no other avenue such as self-employment open to them. Thus, job quotas create a system of rationing of regular salaried (public sector) jobs for SC men, capping their access to regular jobs, since they cannot penetrate the non-reserved public sector jobs. A corollary of this is also the generation of an entrenched elite among SC men, who benefit from reservations across generations (Das, 2007).

“Glass walls” and glass ceilings. In the Indian context, apart from their concentration in casual employment, the Indian labor market is also occupationally segregated. Lower castes are restricted to menial, low paying and often socially stigmatized occupations while upper caste groups are concentrated in preferred occupations. This horizontal segregation would result in workers from different social groups being streamed into different trades, occupations and jobs and socially constrained from moving out. Thus, we propose the notion of “glass walls”, where occupationally “bonded” castes face barriers to leaving their traditional occupations. Small studies point to the possibility of small SC entrepreneurs especially in rural areas being prevented from moving out of caste based occupations into self-employed ventures through social pressure and ostracism (see for instance, Venkteswarlu, 1990, cited in Thorat, 2007) and in other ways being denied fair opportunities to participate in more lucrative trades. Iversen and Raghavendra (2007) also find similar patterns in small eating places in South India where workers are typed into their traditional caste occupations. While we are unable to test for these phenomena in this paper, the significant role of selection into wage employment among workers from different castes in our subsequent econometric analysis, suggests some role for such “job discrimination”.¹⁶

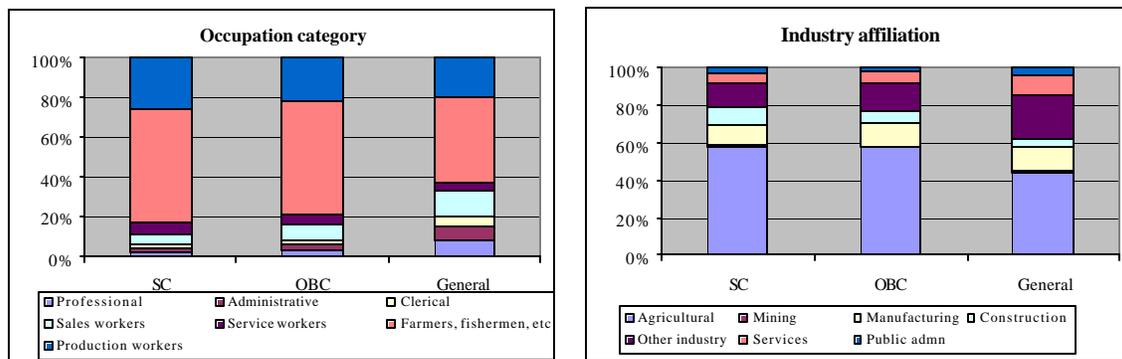
¹⁵ There is some evidence that self-employment and regular employment are often comparable in terms of returns, though casual workers are unambiguously at the bottom of the scale (Glinskaya and Jalan 2006). However, the self-employed are a very heterogeneous group and include white-collar professionals as well as petty traders. For instance, in 2004/05, only about 53 percent of the self-employed perceived their work as adequately remunerative.

¹⁶ Examining this issue of occupational segregation or glass walls is something we propose to do in a companion paper.

Glass ceilings were originally referred to in the context of gender differentials in earnings (see, for example, Albrecht et al 2003). Many labor markets are hierarchical and rationing of “good” jobs, which pay more than necessary to attract labor, can exacerbate caste wage gaps. A glass ceiling is essentially an invisible barrier to advancement within the hierarchy of the labor market, or more narrowly, within an organization. This restriction is not immediately apparent and is usually based, not on objective productive characteristics but on some form of discrimination such as gender, race or, in this case, caste affiliation. The existence of a glass ceiling implies that the gap between earnings of SC workers and that of upper caste workers would be higher at the top end of the earnings distribution rather than at the bottom or middle, conditional on worker characteristics. Thus, glass ceilings manifest as wide differentials at the upper end of the conditional distribution (i.e., after taking productive characteristics into account) but less disparity at the low and middle portions of the conditional distribution.

Therefore, in the Indian context we argue that both glass ceilings and glass walls are likely to be in evidence, indicating respectively a vertical segregation (within the same employment type, workers from different social groups may be represented differently in the hierarchy of positions) and horizontal segregation (workers restricted to their occupations). In both cases, the movement of SC workers upward through occupational categories and social hierarchies may be hampered by institutional barriers and social attitudes. Looking at the distribution of occupational and industry affiliation in labor force by social group (see Figure 2), it is apparent that SC individuals (wage- and self-employed) are concentrated in agricultural and allied industries and construction industries and in mostly blue-collar jobs. For instance, only 2 percent of SC prime-age working individuals are in professional or technical occupations compared to 8 percent of general caste households. These occupations generally tend to be the highest paid within organizations.

Figure 2: Occupational attachment and industry affiliation by social group, 2004/05



Source: NSSO 61st round Schedule 10. See Data section for details. Note: All figures in this paper relate to prime-age adults (aged 20 to 65 years). Occupational attachment is aggregated at the one-digit National Classification of Occupations (1968) level.

These differentials in broad occupational categories persist even among wage workers suggesting horizontal segregation by caste status (see Table 3). However, the differentials are less pronounced amongst wage workers, possibly partly as a result of the long-standing reservations policy in the public sector.

Table 3: Occupational distribution among wage workers, by social group (2004/05)

| | Regular workers | | | Casual workers | | |
|-------------------------|-----------------|-----|---------|----------------|-----|---------|
| | SC | OBC | General | SC | OBC | General |
| Professional/technical | 12 | 17 | 25 | 0 | 0 | 0 |
| Administrative | 1 | 2 | 6 | 0 | 0 | 0 |
| Clerical | 15 | 17 | 21 | 0 | 0 | 1 |
| Sales workers | 4 | 8 | 9 | 0 | 1 | 1 |
| Service workers | 26 | 13 | 10 | 2 | 2 | 3 |
| Farmers, fishermen, etc | 6 | 5 | 2 | 69 | 65 | 58 |
| Production workers | 36 | 37 | 28 | 28 | 32 | 37 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

Das (2005) points out that traditional caste patterns are often seen replicated in the entry of SCs into the public sector workforce. Thus, while SCs were represented proportionately to their population overall in each employment level within the public sector, they were vastly over-represented in the least skilled occupational categories at the lowest employment level. In 2002, over 65 percent of sweepers in central government ministries were SCs indicating that SCs are more likely to undertake “ritually unclean” and manual work. However, SC groups may also exercise monopoly over entry into these jobs.

Earnings gap. To the extent that preferred and generally better-paid occupations or positions are rationed, we would expect differential earnings between otherwise similar workers from different social groups. There is some evidence that the caste or tribal affiliation of an individual determines the wage received in India (Banerjee and Knight 1985; Das 2005; Dutta 2006; Unni 2001; Lakshmanasamy and Madheswaran 1995). As expected, SC and OBC individuals, on average, earn less than general caste workers in all occupational categories, with this raw unadjusted earnings gap higher in predominantly white-collar occupations (e.g., professional, administrative and clerical work) (see Table 4).

Table 4: Average weekly wage (Rs.) among wage workers by social group (2004/05)

| | Regular workers | | | Casual workers | | |
|--------------------------|-----------------|------|---------|----------------|-----|---------|
| | SC | OBC | General | SC | OBC | General |
| Professional/technical | 1536 | 1551 | 2096 | .. | .. | .. |
| Administrative | 2422 | 2719 | 4223 | .. | .. | .. |
| Clerical | 1330 | 1419 | 1679 | .. | .. | .. |
| Sales workers | 510 | 544 | 898 | 470 | 453 | 402 |
| Service workers | 677 | 664 | 911 | 294 | 367 | 388 |
| Farmers, fishermen, etc. | 493 | 478 | 603 | 233 | 232 | 242 |
| Production workers | 791 | 821 | 978 | 384 | 417 | 413 |
| Overall | 920 | 1028 | 1558 | 278 | 295 | 314 |

Note: Average weekly wages include wages received in cash and kind over the week preceding the survey. Wages for casual workers in the first three occupational categories not reported as less than 100 observations in these categories.

Thus, the raw wage gap between SC and GC regular workers is about 0.37 log points, while that between OBC and GC regular workers is about 0.33 log points (see Table 5). At the same time, wage gap between casual workers belonging to different social groups are much lower – that between SC and GC workers is about 0.10 log points while that between OBC and GC workers is about 0.05 log points. However, these are unadjusted wage gaps and at least some part of this difference in average earnings could be explained to some extent by structural differences in

characteristics such as age, education and other worker characteristics. In the next section, using standard decomposition analysis, this paper examines to what extent these differences in wages can be explained by individual worker characteristics and what portion could be the result of differential returns to these characteristics.

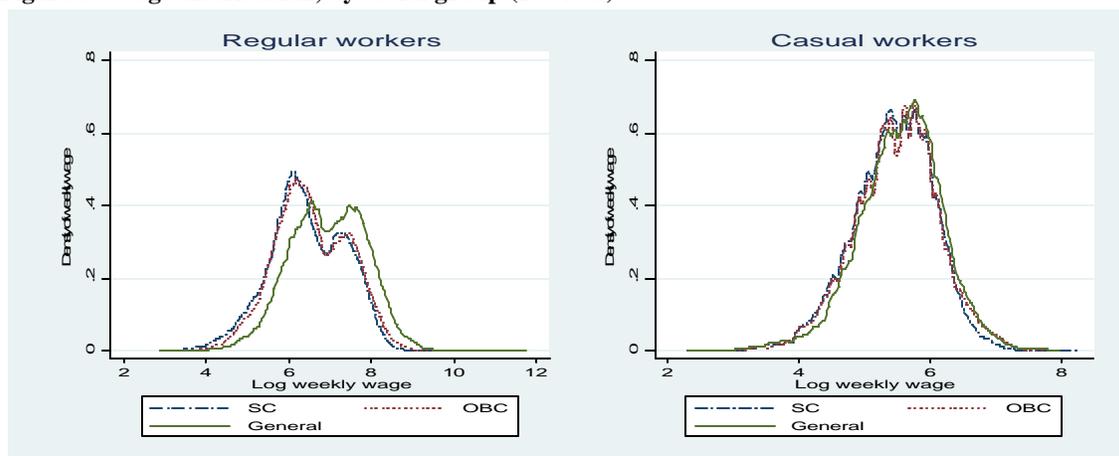
Table 5: Unadjusted wage gap

| | Regular workers | | | Casual workers | | |
|-------------------------|-----------------|----------|--------|----------------|----------|--------|
| | SC | OBC | GC | SC | OBC | GC |
| Mean hourly wages (log) | 2.71 | 2.76 | 3.08 | 2.00 | 2.05 | 2.10 |
| | (0.81) | (0.80) | (0.81) | (0.44) | (0.49) | (0.47) |
| Unadjusted wage gap | 0.374 | 0.328 | .. | 0.096 | 0.050 | .. |
| | (0.0002) | (0.0001) | .. | (0.0001) | (0.0001) | .. |

Notes: Figures in parentheses refer to standard deviation.

Earnings distribution. Similarly, vertical occupational segregation has implications for the entire wage distribution of workers from different social groups. If we assume that the most prestigious and best paid jobs are rationed and that the rationing process is not equitable across social groups, SC workers would have a lower probability of getting high-paying jobs. As a result, the job distribution for SC workers may be similar to general caste workers across average jobs but with a very small proportion represented in the high-paying jobs. In other words, the wage distribution of SC workers may be similar to that of general caste workers at the bottom and middle quantiles but lower at the top quantiles. The kernel density plots in Figure 3 largely bear out this expectation, particularly for regular workers where the distribution is further shifted out to the right for general caste workers than for the other groups (SC and OBC). Given that casual workers are in large part a homogenous pool of low-skilled workers, the kernel density plots do not reflect significant differences between workers from different social groups.

Figure 3: Wage distribution, by social group (2004/05)



These findings are summarized in Table 6. Thus, wage distribution for casual workers, on the other hand, approximates the normal distribution with very little divergence between the mean and median wage. Amongst regular workers, we find that measures of inequality that give greater weight to the middle portion of the distribution (e.g., the Gini coefficient and Theil index) are not substantially different across social groups. However, inequality measures that give proportionately more weight to dispersion in the upper tail of the distribution (such as the half squared coefficient of variation) suggest substantially higher inequality among general caste workers than among the other groups.

Table 6: Wage distribution among wage workers by social group (2004/05)

| | Regular workers | | | Casual workers | | |
|-----------------------------|-----------------|-------|---------|----------------|-------|---------|
| | SC | OBC | General | SC | OBC | General |
| Mean weekly wage | 920 | 1028 | 1558 | 278 | 295 | 314 |
| | (858) | (994) | (1957) | (176) | (204) | (218) |
| Median weekly wage | 583 | 650 | 1050 | 240 | 250 | 280 |
| Population share (%) | 18 | 36 | 45 | 38 | 44 | 19 |
| Wage share (%) | 14 | 30 | 57 | 36 | 44 | 20 |
| Gini coefficient | 0.46 | 0.47 | 0.46 | 0.32 | 0.34 | 0.33 |
| Theil index | 0.35 | 0.37 | 0.38 | 0.17 | 0.20 | 0.19 |
| Half squared coeff. of var. | 0.44 | 0.47 | 0.79 | 0.20 | 0.24 | 0.24 |

Notes: Figures in parentheses refer to standard deviation.

D. Multivariate results

This section presents the empirical results from the wage regression models and from the estimates of the caste wage gap based on the methodology described above. We have four clear results:

1. The wage differentials in casual work between SC and GC (or indeed between OBC and GC) are small, and can be almost entirely attributed to differences in characteristics.
2. On the other hand, the extent of the wage gap is substantial in regular salaried jobs. This differential stands at about 0.37 log points between SC and GC regular workers and at about 0.33 log points between OBC and GC regular workers.
3. Controlling for selectivity the “treatment effect” is high in magnitude – 59% of the wage offer gap between SC and GC regular workers is accounted for by differences in returns to characteristics rather than endowments. The corresponding figure between OBC and GC regular workers is 56%.
4. Selection matters for regular workers. The significant selection effect for SC and OBC regular workers suggests that SC and OBC regular wage employment is more selective in terms of unobservable worker characteristics compared to GC regular wage employment.

Wage regression models. We estimate separate augmented Mincerian wage regression models for regular and casual workers from different social groups – SC, OBC and general castes (i.e., $2 \times 3 = 6$ regression models). The explanatory variables include worker characteristics such as age, literacy and the highest level of education completed, marital status, religion, occupational attachment and industry affiliation as well as controls for rural/urban settlement type, state of residence, and seasonality effects. For brevity, the wage equations are not reported here.¹⁷ The estimated models have fairly high explanatory power for all four social groups – accounting for about half the variation in log wages. The estimated effects are correctly signed and of plausible magnitude, and the majority are significant at the 1% level or better.

Thus, men earn significantly higher wages than women with the male advantage being particularly high among those engaged in regular wage employment (see Das 2005; Reilly and Dutta 2005 for estimates of the gender wage gap in India). The age-earnings profiles display the predicted inverted U-shaped relationship between age and wages (Murphy and Welch 1990). Marriage has the expected positive effect. Being Muslim significantly reduces the wage received

¹⁷ Definitions of variables, summary statistics and full empirical results are available from the authors.

by general caste regular workers and SC casual workers but is an advantage for OBC casual workers.¹⁸

Consistent with previous empirical research (Duraismy 2002; Dutta 2006), returns to education are positive and rising in education level among regular workers (see Table 7). Amongst regular workers, returns to literacy and education are highest for SC workers, followed by OBC workers, implying that SC regular workers are rewarded the most for acquiring education (especially at lower levels of schooling). In other words, education has an equalizing effect. It appears that this result may be driven by rural regular workers. For example, Unni (2001) finds that returns to education are highest among SC salaried male workers in rural areas, relative to other castes. In contrast, Madheswaran and Attewell (2007) find that, among urban regular workers, the returns to completing middle and higher secondary school education are higher among SC/ST workers, while returns to other educational levels are lower.

However, it should be noted that these estimates do not control for innate ability, schooling quality and family background. The latter in particular could influence greatly both the quality of schooling and the ability to find jobs through networks. For instance, in a study of urban Uttar Pradesh, Kingdon (1998) finds that ignoring family background (such as parental education) overstated the returns to schooling by about two percentage points. This was particularly important at the graduate and higher levels as individuals who acquire higher education generally belong to privileged backgrounds so that some part of their return to education arises from their backgrounds. This is likely to be a critical form of intergenerational transmission of education among workers from different castes.

Table 7: Wage regression models – Education

| | Regular workers | | | Casual workers | | |
|--------------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|----------------------|
| | SC | OBC | General | SC | OBC | General |
| Completed primary school | 0.1446*** (0.0261) | 0.1301*** (0.0156) | 0.0864*** (0.0160) | -0.0063 (0.0076) | 0.0130** (0.0064) | 0.0185** (0.0079) |
| Completed middle school | 0.2418*** (0.0340) | 0.2129*** (0.0196) | 0.1498*** (0.0204) | -0.0234** (0.0092) | 0.0088 (0.0092) | 0.0223* (0.0119) |
| Completed secondary sch. | 0.4037*** (0.0477) | 0.3736*** (0.0270) | 0.3074*** (0.0244) | -0.0544*** (0.0147) | -0.0025 (0.0150) | 0.0354* (0.0206) |
| Graduate | 0.6617*** (0.0636) | 0.6122*** (0.0357) | 0.5885*** (0.0318) | -0.0940** (0.0380) | -0.0535** (0.0259) | 0.0436 (0.0380) |
| Observations | 5463 | 12065 | 15280 | 10313 | 13126 | 5961 |

Note: Hourly wages are in logarithmic terms. Standard error in parentheses. ***, **, * represent significance at the 1%, 5% and 10% level of significance respectively. Illiterate workers are the omitted reference educational category.

In contrast, and reinforcing the notion of casual workers being largely a homogenous pool of low-skilled workers, SC and OBC casual workers face at best flat returns to post-primary education. Indeed, the returns to completing post-primary school are negative, especially for SC workers, especially when we control for potential selection bias. This indicates that either there is a low demand for skill or that the acquired skills are not useful in the casual labor market, especially once individual characteristics besides human capital variables are taken into account. It could be argued that the acquisition of certain education levels might reduce productivity if education

¹⁸ Although originally a Hindu tradition, castes have emerged in other religions in India, largely as a result of religious conversions by low caste Hindus in an attempt to escape their caste identities.

causes a worker to find casual work demeaning and to not apply as much effort as less educated workers. However, this also reflects the low proportion of educated individuals in casual wage employment. This is supported by the multinomial model, where education at any level has a negative effect on the probability of being in casual wage employment.¹⁹ The exception is marginally rising returns to education for general caste casual workers. It is possible that these workers benefit from better and more extensive social networks that give them access to better types of jobs and wages.

Occupational dummy variables are jointly significant and support the expected positive relationship between skills and wages particularly for regular workers (e.g., administrative and professional workers earn significantly more than agricultural workers) (see Table 8). However, standard t-tests reveal no significant difference in the returns to occupation across social groups for regular workers. The size and significance of the occupational attainment variables suggest that these are likely to be an important cause of the wage differentials between SC and non-SC workers.

Table 8: Wage regression models – Occupation

| | Regular workers | | | Casual workers | | |
|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|
| | SC | OBC | General | SC | OBC | General |
| Professional/technical | 0.2016*** (0.0461) | 0.2575*** (0.0339) | 0.2156*** (0.0356) | 0.0726 (0.0567) | 0.0745 (0.0881) | 0.1923*** (0.0628) |
| Administrative | 0.3601*** (0.0643) | 0.3961*** (0.0414) | 0.4886*** (0.0392) | 0.1504* (0.0894) | -0.0212 (0.0831) | -0.0063 (0.0751) |
| Clerical | 0.0411 (0.0413) | 0.1355*** (0.0321) | 0.0956*** (0.0341) | 0.051 (0.0422) | -0.0354 (0.0439) | 0.0051 (0.0446) |
| Sales workers | -0.0435 (0.0444) | 0.0145 (0.0344) | 0.0092 (0.0383) | 0.0709 (0.0438) | -0.1129*** (0.0261) | 0.0052 (0.0485) |
| Service workers | -0.0224 (0.0438) | 0.0535 (0.0333) | 0.0491 (0.0355) | 0.0496* (0.0255) | -0.0349 (0.0255) | 0.058 (0.0416) |
| Production workers | 0.0279 (0.0418) | 0.1017*** (0.0319) | 0.0166 (0.0341) | 0.0701*** (0.0178) | -0.0305 (0.0208) | 0.0287 (0.0372) |
| Observations | 5463 | 12065 | 15280 | 10313 | 13126 | 5961 |

Note: Hourly wages are in logarithmic terms. Standard error in parentheses. ***, **, * represent significance at the 1%, 5% and 10% level of significance respectively. Farmers and agricultural workers are the omitted reference occupational category.

Residing in rural areas significantly reduces the wage received. Seasonal effects (interacted with settlement type) are jointly significant while the state dummy variables are almost all significant at the 1% level or better. State and industry dummy variables are almost all significant at the one per cent level or better indicating the presence of inter-regional and inter-industry wage differentials. Location variables are more relevant for casual workers as these are predominantly agricultural laborers and the agricultural wage differs significantly from state to state.

Average caste wage gap. We estimate the caste wage gap using the methodology described in the previous section. The caste wage gap is decomposed into endowment and treatment effects (evaluated at the general caste worker returns and the mean set of SC or OBC characteristics). The first component reflects the extent of wage differentials that arise due to differences in worker characteristics; the second is often taken to be a measure of the extent of discrimination in

¹⁹ Introducing controls for selection bias reduces the rates of return to all levels of education significantly.

the labor market, though it could also reflect the effect of unobserved characteristics such as ability, family background, etc. Table 9 presents the results of the decomposition of the average caste wage gap amongst regular and casual workers, based on the assumption of a GC wage structure in the absence of unequal wage treatment across caste.

Table 9: Decomposing the average caste wage gap (SC, OBC vs. GC workers)

| | Without selection | | | | With selection | | | | |
|-------------------------|-------------------|---------|---------|----------|----------------|---------|---------|----------|---------|
| | Total | Endo | Treat | % Treat. | Wage offer | Endo | Treat | Sel. | % Treat |
| Regular workers: | | | | | | | | | |
| SC vs. GC | 0.37 | 0.25*** | 0.13*** | 35 | 0.61*** | 0.25*** | 0.36*** | -0.24*** | 59 |
| | (0.0002) | (0.007) | (0.011) | | (0.12) | (0.01) | (0.12) | (0.06) | |
| OBC vs. GC | 0.33 | 0.20*** | 0.13*** | 40 | 0.45*** | 0.20*** | 0.25*** | -0.13** | 56 |
| | (0.0001) | (0.008) | (0.011) | | (0.07) | (0.01) | (0.06) | (0.06) | |
| Casual workers: | | | | | | | | | |
| SC vs. GC | 0.10 | 0.10*** | -0.006 | .. | 0.17*** | 0.10*** | 0.07 | -0.08 | .. |
| | (0.00009) | (0.012) | (0.013) | | (0.05) | (0.01) | (0.05) | (0.06) | |
| OBC vs. GC | 0.05 | 0.07*** | -0.02 | .. | 0.026 | 0.07*** | -0.05 | 0.02 | .. |
| | (0.00009) | (0.017) | (0.018) | | (0.06) | (0.02) | (0.06) | (0.04) | |

Note: hourly wages are in logarithmic terms. Standard error in parentheses. ***, **, * represent significance at the 1%, 5% and 10% level of significance respectively. The proportion of unexplained wage gap (treatment effect) in the total wage gap (or wage offer gap) is not given for casual workers as the treatment effect is not significantly different from zero in any of the estimates. Decompositions are based on equations (3) and (3)'.

Unsurprisingly, the extent of the average wage gap between casual workers belonging to different social groups is very small and can almost entirely be explained by differences in worker characteristics. This is entirely consistent with the notion of a relatively homogeneous pool of low-skilled casual workers. Discrimination in the casual labor market would be far more likely to operate with respect to differential access to jobs and hours worked rather than differences in wages paid.

Amongst regular workers, on the other hand, the extent of the wage gap is substantial at about between SC and GC regular workers is about 0.37 log points, while that between OBC and GC regular workers is about 0.33 log points.²⁰ The endowment effects, i.e., differences in the total wage gap attributable to differences in worker characteristics, comprise about two-thirds of the overall wage gap. The treatment effect is more modest in magnitude and suggests that the unequal treatment of SC and OBC regular workers provided an average *ceteris paribus* hourly wage advantage for GC regular workers of about 13 percent. Controlling for selection, however, suggests that the treatment effect is significantly higher in magnitude, more so for SC workers. For instance, about 59% of the wage offer gap between SC and GC workers is accounted for by differences in returns to characteristics rather than endowments (see right-hand side panel in Table 9). The corresponding figure for OBC (relative to GC) workers is 56%. Thus, the treatment effect, after controlling for selection, accounts for over half the wage gap. The unequal treatment of SC and OBC regular workers provides an average *ceteris paribus* hourly wage advantage for GC regular workers of about 36 and 25 percent respectively. In addition, there appears to be a significant role for selection in regular wage employment - the significant selection effect for SC

²⁰ This is somewhat smaller than the unadjusted gender wage gap in India – about 0.42 log points in 2004/05, of which about 60% can be attributed to differential treatment (see Reilly and Dutta 2005).

and OBC regular workers suggests that SC and OBC regular wage employment is more selective in terms of unobservable worker characteristics compared to GC regular wage employment.

These findings are consistent with the limited empirical information available on this issue. Banerjee and Knight (1985) find a significant role for wage discrimination in their study of migrant workers in urban Delhi. Madeshwaran and Attewell (2007) find that endowments explain about 79% of the wage differential between SC/ST and others (including OBC) regular workers and in the urban labor market in 1999/2000. This is comparable with the estimated 65% contribution of differences in endowments (see left-hand side panel of Table 9) without controlling for selection. While there are differences in the estimation approach, it is possible that the role for unequal treatment and caste discrimination is less important in urban India.²¹

The empirical analysis earlier and the size and sign of the occupation variables in the wage regression models suggest that differences in access to occupations is an important driver of differences in earnings by caste. The reported estimates confirm this supposition as about one-fifth of the endowment effect is accounted for by caste differentials in occupations.²² To the extent that selection into occupations is not random and there is occupational segregation (or our notion of “glass walls”), the effect on wages would operate through these channels. Madeshwaran and Attewell (2007) also find that job discrimination (defined as unequal access to certain occupations) plays a significant role in explaining overall wage differentials in the urban labor market, even more so than purely wage discrimination. At the same time, we find that unequal treatment within broad occupational categories was not found to be significantly different from zero. It is possible that examining this question using more disaggregated occupational categories might suggest some role for unequal treatment within more narrowly defined occupations. However, it is also entirely possible that such discrimination *within* occupational categories is not significant. For instance, there is some evidence that the earnings differentials between otherwise similarly qualified workers holds true even among highly qualified professional graduates from elite universities, possibly due to weaker connections in the formal labor market (Deshpande and Newman 2007). Ultimately, this is an empirical question and one that we seek to explore in a companion paper.

It should not be assumed that the entire treatment effect is attributable to discrimination. At least part of the effect could be due to omitted variables that are correlated with wages, such as ability or family background. However, it can be argued that these unequal labor market outcomes have their roots in discrimination in the past that has led to more deprived backgrounds of SC and OBC workers. These influence earnings indirectly through lower out of school investments and/or lower quality education, poorer nutrition and health status and lower social capital (in the form of networks in the labor market). These would be expected to result both in lower

²¹ Madeshwaran and Attewell include controls for public sector employment, union membership and permanency of job contracts in their wage regression models. These work-related characteristics would naturally go a long way in explaining wage differentials. However, there are concerns of measurement error in these variables in the 2004/05 survey used in this paper. As mentioned earlier, the data do not readily permit a neat division of workers into public and private sector employment, particularly those employed in registered companies (see also Glinskaya and Lokshin 2005). The union membership is patchy, especially in earlier years and nearly half the observations on regular workers have missing data. Comparisons with the ILO estimates of union membership as a share of formal sector wage earners also suggest that using the survey data vastly overstates this proportion.

²² Disaggregated decomposition results available on request.

endowments and, to the extent that these are passed on to successive generations, would result in persistent wage differentials over time.²³

E. Conclusions

This paper used a nationally representative employment survey to investigate the magnitude of the wage differential between SC and non-SC workers and the extent to which this can be attributed to unequal treatment of SC workers. The hypothesis is that the hierarchical nature of the caste system and the strong association of ritual purity with different occupations translate into poorer labor market outcomes, including occupational segregation and wage discrimination. Separate wage equations, corrected for selection bias, are estimated for different social groups (scheduled castes, other backward castes and general castes) in regular and casual wage employment. Conventional index number techniques are used to decompose the caste pay gap into 'endowment' and 'treatment' components.

To summarize, there is evidence of significant wage gaps between SC and GC workers (and to a marginally lesser extent between OBC and GC workers) engaged in regular wage employment. Thus, the treatment component accounted for between a third and half of the raw wage differential, depending on whether or not selection into regular wage employment is taken into account. Occupational segregation is a strong correlate of wages received and plays some role in explaining these wage gaps, but there is no evidence of unequal treatment within broad occupation categories. While the entire treatment effect cannot be attributed to current discrimination, at least some part (including differences in characteristics that go into the endowment effect) reflect the more deprived backgrounds of SC and OBC workers possibly due to past discrimination.

What do our results tell us about the Indian labor market? The empirical evidence in this paper suggests that caste is still a very potent determinant not just of selection into employment type but also of how individuals are remunerated in the regular wage labor market. Glass walls - segregation into occupations - is a strong correlate of wages received and plays some role in explaining these wage gaps, but there is no evidence of unequal treatment within broad occupation categories. The fact that the caste wage gap is high in regular salaried jobs and that a large part of this gap cannot be explained by differences in endowments alone is probably driven by an insidious manner in which caste plays out in the regular salaried labor market. This is where we believe our notion of "glass walls" plays a critical role. In a manner peculiar to India (and perhaps Nepal), the very process of segregation into certain occupations (through social norms and institutional barriers) is related to caste status. Thus, castes have clustered around occupations, whether by choice or compulsion. A more positive spin on this comes from the anecdotal evidence that some occupations have "modernized" and taken advantage of the "new economy". Thus, brass workers or leather workers in small urban enclaves are beginning to do better or roadside barbers growing into beauty saloons as they move upwards economically but remain within the broad occupational category. But these are not wage workers and will not show up in our analysis. Also, despite increasing anecdotal evidence of "upwardly mobile occupations" in the aggregate these are probably very small and SC workers tend to still remain restricted to low-paying, low-skilled manual occupations, even in the salaried market.

²³ Though data limitations do not allow us to capture parental background, we attempt to control for some of these factors in the selection model - for example, average land possessed by the household is used as a factor determining selection into regular or casual wage employment.

Should this role of caste in the salaried labor market in a Constitutional context that mandates equality of opportunity not change with education? And should SC workers in the regular salaried market not have access to better jobs and wages? Our analysis does not point to regular salaried jobs as an equalizing or “caste-destroying” force – but education appears to have an equalizing effect. Differences in access to occupations or glass walls is likely to be an important cause driving differences in wages by caste. While we control for broad occupational categories in the wage regression models, occupational segregation at the hiring stage itself would influence wages received. The agenda for future research is to extend this analysis to examine the relative roles of job and wage discrimination over time using a variant of the decomposition method developed by Brown et al (1980) using previous NSS rounds. In addition, we will examine the evidence for glass ceilings by estimating the wage gap at different positions of the conditional earnings distribution using quantile regression techniques. Given the long-standing positive discrimination policy of the Indian government in terms of job reservations in the public sector, to the extent the data permits, we would also like to examine these issues for the public and private sector separately and to probe deeper into the relative differentials between SC and OBC workers.

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