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By

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ABSTRACT

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Two essays are presented to explore the causes of wage inequality and welfare disparities across social groups in India. Since economic reform started in 1991, there have been serious concerns with increasing income inequality, including increasing wage income differentials, especially in urban areas. In contrast, the social groups who historically subjected to discrimination and deprivation, namely scheduled castes (SC) and scheduled tribes (ST), are still highly represented among the poor.

By using nationally representative large household survey covering both 1980s and 1990s, we find in Essay 1 that wage income inequality in urban India started increasing even before 1991. Wage inequality increased for the whole distribution in the 1980s, while it increased in the upper half of the distribution during the 1990s. The increase in wage inequality after 1993 was mainly attributable to increase in returns to schooling and experience, specifically tertiary-secondary school wage differentials. Accelerating skill premium in the 1990s was accounted for by increase in demand for skilled labor.

Essay 2 analyzing the disparities of living standards between SC/ST and the majority in rural areas shows that SC/ST are poorer not only because they own less human capital and assets but also because they earn lower returns to these assets than majority households. In the aggregate, half of the welfare

disparities due to castes and ethnicity can be explained by the different returns. The contribution of different returns between SCs and majority had very small change over 10 years. This is partially because SC households still have disadvantages of getting well-paid occupations. Increasing migration among skilled STs seems to contribute significant decline of the differences in returns between STs and majority. The fact that STs tend to live in less productive remote areas explains large part of disparities from the majority, though STs earn lower than the majority even within villages where both ST and majority households reside.

To my parents

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CHAPTER I

INTRODUCTION

Poverty in India has been enthusiastically studied by economists. Since one third of the poor in the world live in India, understanding poverty in India is crucial for reducing the poor in the world. In the 1990s which is characterized as the economic reform period in India, it was observed that the Indian economy experienced higher economic growth and that the poverty counts also declined. While the aggregate income gains in the 1990s are undeniable, it is less clear how much India's poor have shared in those gains and how inequality has been changed.

In the 1980s and 1990s, income inequality increased in many countries. In India, some studies show increase in inequality in urban areas and rise in rural-urban disparities in the 1990s (Deaton and Drezé 2002). Such increase in inequality is worrisome since higher inequality may make poverty reduction more difficult for a given level of economic growth (Ravallion and Chen 1997). Political instability due to increase in inequality may deter restructuring of the economy and worsen the welfare of the poor in real terms.

Recent literature on India tend to evaluate whether the undertaking economic reform since 1991 helps reducing poverty and increasing economic growth, by just comparing the economic outcomes before and after the reform. This study does not attempt to assess the impact of the reforms on inequality, which would require identification of the counter-factual of what would have happened in the 1990s without the reforms. Rather, the purpose of this study is to carefully investigate what

has actually happened to the inequality in India and what the causes of such changes in inequality are. Nationally representative, large household survey conducted by National Sample Survey Organization in India, covering the 1980s and 1990s is used for this objective.

Analyses below are based on human capital earning equation, now known as Mincerian wage equation. This wage equation derived from individual's maximization problem of net present value of expected future returns from schooling investment given individual's logarithm of earnings function. First order condition for this problem yields equality between discount rate (or interest rate) and partial derivative of earning equation with respect to years of schooling. Since individual invests in education until the return equals to discount rate, the coefficient of years of education in Mincerian wage equation can be interpreted as the returns to education. This is why we call the coefficients of education in wage equation "returns" in the following chapters.

Essay 1 addresses the issues on urban inequality, specifically wage earning inequality. Some case studies and articles report contrasts between better-off and worse-off groups in the 1990s (Economist 1997, Arun and Arun 2002, Krishna 2001) and suggest that education and occupation are important factors for such disparities. Since wage earning disparities as a result of labor market outcomes can be caused by unequal distribution of human capital such as schooling, accelerated investments in higher education observed in urban India might have impacts on rise in wage inequality by changing the distribution of human capital in urban labor market. Human capital theory, however, implies that wage earning inequality can also

increase by increase in skill prices and unequal distribution of unobserved characteristics such as ability. Therefore, it is not clear what attributed to increase in wage inequality in India.

The questions to be asked in essay 1 are (1) whether there are any differences in the trend of wage inequality between 1980s and 1990s, (2) what the major source of rise in wage inequality is, and (3) how the distribution of skills such as education and experience in the labor market affect the wage inequality. After carefully documenting the changes in wage inequality, we apply the full-distribution accounting scheme by Juhn, Murphy, and Pierce (1993) to nationally representative data from India to understand the source of wage inequality.

We find that the wage earning inequality in urban India increased mainly among better-off groups defined by those whose wage lies above the median of the wage distribution. This trend was accelerated in the 1990s. The major source of such increase in wage inequality was found to be rise in skill price measured as the returns to skills after 1993, while unequal distribution of skills mainly contributed to increase in wage inequality before 1993. Further analysis shows that this rise in skill price was likely to be induced by increase in demand for skilled labor.

In essay 2, we examine the welfare[1] disparities in rural India across social groups, namely scheduled castes (SCs), scheduled tribes (STs), and the other majority households. It is well known that the poor are highly found among SCs and STs who were historically subjected to discrimination and deprivation. Even though poverty in rural areas has been declining on average, there can be differences in poverty

[1] Per capital expenditure is used as a measure of welfare in rural households since the share of wage employment is relatively small in rural India, which makes it difficult to capture the differences in rural living standards if we use wage earnings.

reduction across these social groups. Redistribution of land and affirmative action such as reserving seats in educational institutions and political bodies have been attempted to decrease such disparities by increasing physical and human capital of these economically weakest groups. It is possible, however, that even if SCs/STs had same amount of capital, such groups could earn lower returns than the other majority groups.

In order to understand the sources of observed differences in living standards, our research questions in essay 2 are (1) whether it is a common econometric model but different endowments that create the welfare disparities between SCs/STs and the majority or whether there are structural differences in the returns to endowment, (2) what makes the living standards of SCs/STs lower than those for the majority, (3) how these welfare disparities change over time, and (4) whether the major source of the disparities is different between SCs and STs.

Human capital earning equations are regressed separately for SC, ST, and majority households. The coefficients for these econometric models are jointly tested and we find they are statistically different from each other. Especially, the returns to education for SCs/STs are much lower than those for the majority, while the returns to land for SCs/STs are higher than those for the majority. Decomposition analysis shows that such structural differences in aggregate between SCs/STs and the majority contribute to about half of the welfare disparities. Between 1983 and 1993, the structural differences between SCs and the majority little changed while the contribution of structural differences between STs and the majority during this period declined by 10 percentage point. We identify that there seems to be still caste-based

occupational choice, which plays a role to sustain the structural differences between SCs and the majority. In contrast, as migration of educated STs increased in this period, it seems that structural differences between STs and the majority could decrease.

The concluding chapter of the dissertation summarizes the key findings of the study. The contribution of the research is highlighted and future work is suggested.

CHAPTER II

ESSAY 1

Why Did Wage Inequality Increase?: Evidence from Urban India 1983-99

1. Introduction

Wage structure, which has been one of the central issues economists research for a long time, gained increased attention especially in the last decade. This is partly because increasing inequality became salient in many countries in the 1980s and 1990s (Milanovic 2002). Especially research on changes in the wage structure and earning inequality for the United States contributes to methodological development to understand the changes in wage inequality more thoroughly (Juhn, Murphy, and Pierce 1993, Katz and Murphy 1992). Changes in wage structure are examined by decomposing between- versus within-group components and changes in quality between cohorts versus changes in skill prices within cohorts for identifying the source of wage inequality (Katz and Autor 1999).

As a cause of increase in wage inequality and educational wage differentials in the US, several explanations are provided such as an increased rate of growth of the relative demand for more skilled workers driven by skill-biased technological changes (Autor, Katz and Krueger 1998, Juhn et al. 1992, Bound and Johnson 1992), a slowdown in the rate of growth of relative supply of skills (Katz and Murphy 1992), changes in labor market institutions (DiNardo, Fortin and Lemieux 1996), and a shrink of the relative demand for less educated due to increase in trade with developing countries and foreign outsourcing (Wood 1995). In order to identify the

causes of wage inequality, such detailed analyses are required. However, little previous empirical work for developing countries has examined such causes of rising wage inequality.

The purpose of this paper is to analyze the changes in wage structure in urban India during the 1980s and 1990s by using four rounds of nationally representative large household surveys. India in this period provides an interesting case because the economy faced drastic changes in terms of economic policy, economic growth, and income distribution. After the long period of the Soviet-type central planning economic policy, the economic reform process started in 1991 following the balance of payment crisis due to government's deficit spending[2].

Partly due to opening the economy, the growth rates in national output since the mid-1980s[3], and in particular since 1993, increased more rapidly than in the 1960s and 1970s (Datt and Ravallion 2002). Though India has traditionally experienced relatively low levels of inequality, there are some indications of rising inequality of income distribution especially after economic reform started[4]. Growth would decrease poverty while unequal distribution could deter poverty reduction. Such increase in wage earning inequality is, therefore, worrisome in terms of reducing

[2] Though limited deregulation actually started in the mid-1980s, the reforms of the 1990s are much wider and deeper (Sachs et al. 1999). The post-reform period can be divided into two phases, the period between 1991 and 1993 essentially being the stabilization phase and the period from 1994 onwards being the time frame to evaluate the longer-time objective of attaining and sustaining high rates of economic growth (Ahluwalia 1999).

[3] Rapid industrial growth took place in spite of moderate trade liberalization in the 1980s. Keynesian expansion, reflected in large fiscal deficits was a major cause of fast growth, thereby the growth was unsustainable (Johi and Little 1994).

[4] Deininger and Squire (1998) found U-shaped relationship (contrary to Kuznets hypothesis) using Indian time series data (1951-1992) by regressing Gini coefficients of real per capita income. Recent estimates of consumption inequality indicates increasing inequality in 1990s (Deaton and Dreze 2002). The examples of the beneficiaries are graduates from the country's top business schools whose salaries have risen 30% in 1997 (The Economist 1997), and the educated professionals working in software industry who enjoyed annual wage rise at 20% (Arun and Arun 2002, Kumar 2001). Many small scale industries, however, face hardships (Roy 1999, Krishna 2001).

poverty in India since empirical evidence shows negative effects of higher inequality on poverty reduction (Ravallion and Chen 1997). Although there are concerns about increase in inequality in India, few studies have sought to empirically explain why inequality is rising.

Since there is no comprehensive analysis on changes in overall wage distribution for urban India during the 1980s and 1990s, the first task of this study is to document the changes in the wage structure. The data show that wage inequality measured by wage differentials between 90^{th} and 10^{th} percentiles of wage distribution started increasing in the 1980s, but not in the reform era of the 1990s. This increase in wage inequality does not mean that only the most skilled benefited. During the last two decades, even the poor (workers in the 10^{th} percentile of wage distribution in urban male workers) gained by 30 percent in real term. While the accelerating wage inequality is found mainly in the upper half of the wage distribution, the wage differentials in the lower half of the distribution stays relatively constant.

By decomposing the change in wage differentials, following the method by Juhn et al. (1993), we identify the causes of changing wage income distribution in urban India from 1983 to 1999. An interesting finding of our analysis is that the causes of the changes in wage inequality differed significantly between the 1980s and 1990s. In the 1980s, increasing inequality of observed skills such as schooling and working experience was a major contributor to increase in wage inequality, while the rise in returns to observed skills increased wage income inequality in the 1990s.

Given the result of decomposition analysis, we hypothesize that increase in demand for skilled workers rose the returns to skills, then accelerated the increase in

wage inequality in the 1990s. Labor demands for 20 different skill groups are measured by using the fixed-coefficient manpower requirements index explained in Katz and Autor (1999) and we find that demand for most skilled workers increased over time, especially in the 1990s.

The paper is organized as follows. Section 2 describes the data used in this study and structure of Indian urban labor market, whereas Section 3 documents the trends and characteristics of wage inequality. In Section 4, the increase in wage income inequality is decomposed into three components by the full-sample distribution accounting scheme developed by Juhn et al. (1993). The hypothesis to explain the rise in wage inequality in the 1980s and 1990s is examined in Section 5. Section 6 attempts to explain the increase in returns to education and experience in terms of demand and supply changes, which is followed by concluding remarks in Section 7.

2. The Sample Data and Labor Market Structure in Urban India

The analyses that follow are based on wage data for men from four rounds of the National Sample Survey (NSS) conducted in 1983, 1987, 1993, and 1999. These rounds are known as large quinquennial surveys which have Employment and Unemployment schedule as well as Consumer Expenditure schedule. The Employment and Unemployment schedule of NSS is the only survey which includes information on individual's earnings and labor market characteristics for the whole region of the Indian Union (Duraisamy 2000). Each survey covers about 120,000

households and over half a million individuals[5]. The sample of households is drawn based on a stratified random sampling procedure.

Table 1-1 provides an overview of the structure and composition of labor market in urban India. The composition of employment status is quite stable among urban labor force between 1983 and 1999. The fractions of wage/salaried workers and self-employed workers among male labor force are about 53% and 35%, respectively. Labor market participation rate among men is about 88% while it is only 20% among women. Though this paper focuses on urban male workers, excluding female wage workers from the sample does not influence the basic results on overall wage inequality (male and female combined) because of the low rate of female labor force participation.

Throughout the paper we focus on log weekly wages for full-time workers, which are defined as those who worked for at least five days per week[6]. A person who had worked for more than one hour but less than four hours per day would be considered working for half day. Earnings refer to the wage/salaried income receivable for the wage/salaried work done during the reference week. The wage receivable can be in cash or kind and the in-kind wages are evaluated by the current retail prices. Bonus and perquisites are not included in earnings.

Wages are deflated by Consumer Price Index for Industrial Worker (CPIIW) up to the 1983 price level. For the analysis of representative workers with reasonable labor force attachment, the sample is limited to the male urban workers who are aged 21-65, work full time, are not self-employed, and do not attend school. Due to

[5] The households living in urban areas account for about 35% of the sample.
[6] Wage/salaried employees working less than five days per week account for about 8% of all wage/salaried workers. Including such workers to the sample does not change the basic results.

availability of regional price indexes, the urban males living in 16 major states and Delhi are used[7]. The sample size for each year is about 21,500.

The composition of age and educational attainments in the limited sample described above is shown in Table 1-2. Though the age and experience compositions in the sample are relatively stable, there are some indications of aging of the sample between 1983 and 1999. The proportion of the youngest age group (age 21-30) declined from 38% in 1983 to 33% in 1999. While the proportion of the oldest group (age 51-65) did not change in this period, the fractions of age 31-40 and age 41-50 groups increased by 2 percentage points. The proportion of new entrants described as workers with 1-10 years of potential experience[8] was 12-13% and that of workers with 21-30 years of experience ranged between 29% and 33%.

In contrast, the educational composition has changed over time. The proportion of male workers who have no education or some primary education but not completed (see "Below primary" row) declined from 28% in 1983 to 22% in 1999. The fraction of primary or middle school graduates (see "Primary" row) also fell over time. During 1983 and 1999, the proportions of secondary and tertiary school graduates in the sample rose by 5 and 7 percentage points, respectively. Thus it might be the case that wage differentials due to differences in education are partially affected by such compositional change in the labor market.

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[7] Sixteen major states are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. These major states and Delhi cover about 90% of the population in India.

[8] Years of experience are calculated by subtracting years of schooling plus 5 from age. Since NSS does not have question about years of schooling, they are approximated by using information on individual's educational attainment and educational system for the state where the person lives. Most states follow five years of primary, three years of middle (or upper primary), four years secondary levels. In some states such as Assam, Gujarat, Karnataka, Kerala, Maharashtram and West Bengal, primary school takes four years. In West Bengal, four-year middle school system is adopted (Aggarwal 2000).

3. Change in Wage Inequality

Existing studies on wage inequality in India focus more on gender bias (Malathy and Duraisamy 1993, Duraisamy and Duraisamy 1997, Kingdon 1998, Duraisamy and Duraisamy 1999). However, there is no study analyzing changes in wage income inequality in India over time. In this section, we carefully describe the trends and change in wage structure in the 1980s and 1990s.

Overall wage inequality is measured by log wage differentials between 10^{th} and 90^{th} percentiles of wage distribution. Different from other measures such as variance and standard deviation, this measure is less sensitive to outliers. We also distinguish changes in wage inequality below and above the median of wage distribution, which allow us to identify which part of the wage distribution becomes more unequal over time. The lower half of the distribution, defined as log wage differentials between 50^{th} and 10^{th} percentiles of wage distribution, can tell us about the distributional changes mainly among the poor, while changes in the upper half of the distribution focus more on those among the non-poor.

In order to examine the change in wage differentials visually, Figure 1-1 plots real weekly wage index of the 10^{th}, 50^{th}, and 90^{th} percentile groups for 1983-1999, where wages for the three groups are indexed to be all unity in 1983. The median wage series indicates that real wages increased relatively steadily from 1983 through 1993 so that real wages were about 40-50% higher in the 1990s than in 1983. For the least skilled workers represented by the 10^{th} percentile group, wages rose slowly between 1983 and 1987, increased by 25% between 1987 and 1993, and changed

more moderately after that. In contrast, real wages for more skilled workers belonging to the 90th percentile group rose more rapidly from 1983 to 1999.

In sum, between 1983 and 1999, workers in the top 10% of the wage distribution have gained more than 100%, whereas workers in the bottom 10% have gained 30% in real terms. The important message from this figure is that wage inequality increased mainly among the non-poor in the wage distribution above the median[9]. It is also important to notice that the poor measured by workers in the bottom 10% of the wage distribution actually did gain in the last two decades.

In order to demonstrate that the divergence in wage is not limited to comparisons of the most and least skilled workers, Figure 1-2 graphs the log real wage changes between 1983 and 1999 by percentile group. Workers at the utmost upper end gained about 75% and workers in the lowest 40 percentiles gained about 30%. It is, therefore, reasonable to conclude that wage inequality have increased more significantly in the upper half of the wage income distribution[10]. It is also important to note that even workers in the lowest percentiles gained in real terms during the 1980s and 1990s, which is a contrasting evidence with the U.S. labor market where workers in the bottom 10 percentiles actually lost 5 percent in real terms between 1964 and 1988 (Juhn et al. 1993).

Figure 1-3 contrasts the differences in wage inequality trends by subperiod. According to Panel A, which shows increase in overall wage inequality between 1983

[9] This relationship is even clearer if we include the workers with less than 5 days a week additionally. Thus, little change in wage inequality below the median in the 1980s and 1990s is not the artifact of our sample selection procedure excluding individuals working less than 5 days per week.

[10] If we use male weekly wage data from both rural and urban sample, we find a V-shape curve with shallower angle below the median than above the median. This means that the wage differentials in the lower half of the wage distribution declined between 1983 and 1999 not only within urban areas but also in all India, while the wage inequality increases in the upper half of the wage distribution.

and 1987, there is clear positive correlation between the income position and growth rate of real wage income in this period. For example, workers at the 10^{th} percentile of the wage distribution gained only 5% while workers at the 90^{th} percentile gained 25% between 1983 and 1987. Panel B indicating the changes of log wage between 1987 and 1993 shows that wage for 10^{th} percentile group increased more than that for 50^{th} percentile group, which suggests that wage inequality was improved at the lower percentiles (below the 50^{th} percentile). Though workers around the median of wage distribution gained by smallest percent, even their wage increased by 15%. At the upper percentiles, there was the positive correlation between income position and wage increase (rising inequality). Between 1993 and 1999 (Panel C), the pattern of changing inequality is similar to that between 1987 and 1993: decrease in inequality in the lower half of the wage distribution and increase in inequality in the upper half of the wage distribution. Workers in the bottom and top percentiles gained 13% while the median workers barely gained. How to explain these contrasting differences in the patterns of wage income growth among income groups across subperiods is one of the major issues to be addressed in this study.

Table 1-3 summarizes these changes by using usual inequality measures of standard deviation and log wage differential between percentile groups. From 1983 to 1999, the standard deviation of weekly wage income increased from 0.72 to 0.83 (an increase of 15%). During the same period, the log wage differential between the 90^{th} and 10^{th} percentiles increased from 1.63 to 2.00, confirming the increasing wage disparity among income groups. It is important to note that over the full period the increase in inequality has been mainly due to increase in wage income of wealthy

groups above the median. It is also clear that the patterns of changes examined in Figure 1-3 are consistent with the results of comparisons in Table 1-3: Between 1983 and 1987, wage income inequality increased in all classes of the wage income distribution, while increase in wage inequality after 1987 came primarily from income divergence in the upper half of the distribution.

The results presented so far refer only to changes in the overall wage income distribution and, hence, do not tell us how these changes break down into changes within groups (defined by education and experience) and changes between groups. In order to explore the impact of work experience, Figure 1-4 looks at log wage changes by percentile group separately for workers of 1-10 and 21-30 years of experience. The percentiles on the horizontal axis refer to those of specific experience group. Within both experience groups, workers at the lower percentiles gained much less than workers at the higher percentiles. Wage inequality, therefore, has increased even within a group.

Figure 1-4 also shows that between-group wage differentials increased. Workers with 21-30 years of experience gained more throughout the wage distribution relative to new entrants group from 1983 to 1999. Given the existing positive wage differential in favor of older groups over younger groups, such change in experience-wage structure must have contributed to the increase in overall wage inequality. Thus, it is clear that work experience is an important factor affecting changing wage income distribution over the last few decades.

Figure 1-5 looks at real wage changes for different educational groups (primary, secondary, and tertiary school graduates) separately for workers of 1-10

(Panel A) and 21-30 (Panel B) years of experience. There are some indications that the between-educational group differential (especially between secondary- and tertiary-school graduates) moved in the direction of greater inequality for both age groups. On average, the tertiary-school graduates gained 10% relative to secondary-school graduates in the older group (30% among the new entrants). Secondary-school graduates gained 15% relative to primary-school graduates in the older group.

The increases in inequality within educational groups are also striking (except primary-school graduates, for whom within-group inequality declined in the lower half of the distribution). As Panel A in Figure 1-5 shows, secondary-school graduates at the 90th percentile gained about 35% in real terms from 1983 to 1999, whereas secondary-school graduates at the 10th percentile gained only 10%. The relative wage changes for tertiary graduates show more significant increase in inequality, with the 90th percentile tertiary-school graduates gaining about 70% and the 10th percentile tertiary graduates losing 10%. The increase in wage differentials within educational group is also found among the more experienced group (Panel B), for whom the within-educational-group inequality for secondary school graduates increased more while that for tertiary school graduates increased less than that for new entrants group.

Figure 1-4 and 1-5 provide concrete evidence that wage income inequality has increased not only between groups but also within groups defined by work experience and education. To analyze variations in income within narrowly defined education and experience categories, let us take a look at the distribution of residuals from a

regression of log weekly wages on education and experience[11], which are expected to capture the differences in income arising from the effects of unobservable factors.

Table 1-4, which shows the inequality measures similar to Table 1-3, indicates that residual distribution follows the trend similar to change in overall log wage inequality. For example, change in within-group inequality mainly comes from the upper half of the distribution. While there was little change in within-group inequality between 1987 and 1993, the period between 1993 and 1999 is characterized by significant increase in inequality, with workers at the 90th percentile of the residual distribution gaining about 13% relative to workers at the 10th percentile.

It is possible that such increase in wage inequality is the result of larger dispersion in unobserved ability within younger cohorts (new entrants into labor market) due to, say, unequal educational opportunities. In other words, changes in wage inequality could reflect changes in the average quality of different groups rather than changes in the average wage for groups with fixed quality. In order to evaluate this argument, within-group inequality measure is calculated by cohorts identified by individuals' year of birth. Under the assumption that quality or ability is relatively fixed within cohorts after school completion and labor market entry, looking at the changes in wage inequality within cohort could provide better idea to what extent changes in wage inequality reflect the changes in unobserved ability (Katz and Autor 1999).

[11] Log weekly wage is regressed on education dummies for primary, secondary, and tertiary graduates and a quadratic in experience fully interacted with the education variables. The estimation result is provided in Appendix Table 1-1. The specification and justification for using OLS are discussed below.

Table 1-5 shows the 90^{th}-10^{th} percentile differentials of log weekly wage (Panel A) and wage-regression residuals (Panel B) of various 5-year birth cohorts. The workers in the oldest cohort (1925-29) were 54 to 58 years old in 1983 while the workers in the youngest cohort (1975-79) were 20 to 24 years old in 1999. The change of wage inequality for a specific birth cohort over time can be seen by moving horizontally across columns within the same row. Moving downward along a diagonal gives the change for the same age group over time. Within cohorts, inequality changes over time are attributable to time effect or age effect through wage profile of individual's life cycle, while changes in inequality within specific age groups are due to time effect or cohort effect affected by the cohort's observed and unobserved labor quality and composition.

As shown in Table 1-5, there are some patterns on overall wage and within-group inequality across birth cohorts. First, the wage differentials within specific birth cohort increase across time. This can be due to information asymmetry on labor ability (Foster and Rosenzweig 1993). By observing worker's performance, employers are likely to have more precise information about the worker's ability and set their wages depending on these information. Thus the wage differentials can rise. Second, the wage differentials within a birth cohort are smaller for young cohorts than older cohorts for each year but not the other way around. Third, controlling for age, wage differentials increase in most of the age groups, which suggests either higher wage differentials in the younger cohort or increasing time effects. Combined with the previous point that younger cohorts tend to have smaller wage differentials,

the last point may imply increasing time effects. The residual differentials by birth cohorts shown in Panel B take similar patterns.

Although we can not separate age, cohort, and time effects because of the identification problem, we can use a differences-in-differences(-in-differences) approach for tracking the trend of changes in time effect. To eliminate cohort effect, we take differences of wage within cohorts (within-cohort *changes* across time). By taking differences of these within-cohort changes across adjacent cohorts, we can eliminate the age effects, which leaves only a change in inequality growth over time (Juhn et al. 1993). The average changes in the time effect for each subperiod are –0.02, –0.01, and 0.02, respectively. Despite the small magnitude, there seems to be an increasing trend of time effects. This finding suggests that changes in wage inequality largely reflect the changes in the relative price of skilled labor over time, and the changes are not artifacts of changes in the composition of skilled labor.

As we have seen in this section, wage inequality started increasing from 1983 but the growth rate of inequality slowed down between 1987 and 1993, which was followed by higher increase in wage inequality between 1993 and 1999. In the next section, we attempt to identify these differences across subperiods.

4. Decomposition of Change in Wage Income Inequality

Usually the estimation of wage equation can be used for isolating the observed and unobserved effects of wage inequality because the distribution of skills and wage income inequality are linked in wage equation based on human capital theory (Becker 1991, Chiswick 1971). In this model, it is assumed that individuals maximize their

utility or net wealth and invest up to the point where the marginal internal rate of return is equal to the marginal cost of the fund invested[12]. Earnings differences are due importantly to the effects of training, which includes formal schooling and learning through experience.

Simplified Mincerian-type wage equation is written as

(1) $y_{it} = X_{it}\beta_t + u_{it}$,

where y_{it} is the log weekly wage for individual i in year t, X_{it} is a vector of individual characteristics, β_t is the vector of returns to observable characteristics in t, and u_{it} is the component of wages accounted for by the unobservables. This wage equation is estimated by OLS[13] and the results are provided in Appendix Table 1-1.

A common approach to assessing the quantitative contributions of observable and unobservable components of wage dispersion to changes in overall wage inequality is a standard variance decomposition (Mincer 1997, Katz and Autor 1999). Assuming u_{it} independent of X_{it}, the variance of y_{it} can be written as

(2) $\text{var}(y_{it}) = \text{var}(X_{it}\beta_t) + \text{var}(u_{it})$.

Thus the variance of log wages can be decomposed into two components: a component measuring the contribution of observable prices and quantities (between-group inequality) and a component measuring the effect of unobservables (within-group inequality). The change in variance of log wages between two periods can be

[12] In this framework, it is assumed that wage is paid at individual's marginal product of labor.

[13] In developing countries, it is argued that using only wage/salaried workers may cause selection bias. Duraisamy (2000) uses 1993 NSS data for estimating wage equation by both OLS and Joint Maximum Likelihood Estimation (MLE) which attempts to correct for selection bias. The results show that the coefficients of education dummies and years of experience estimated by OLS are very similar to those by Joint MLE. Thus it is reasonable to assume that the selection bias is not so serious We do not use sector of employment as explanatory variables since we consider them as a choice and explained in an economic model.

decomposed into the change in between-group inequality and the change in within-group inequality.

Table 1-6 presents between- and within-group decomposition of the change in the variance of log weekly wages from 1983 and 1999. In the first row indicating the period between 1983 and 1987, the growth of within-group inequality accounts for 68% (0.066/0.098) of the increase in the total variance. In the period between 1987 and 1993, within-group inequality is also important component to the change in the variance of total wage (63%). However, this trend changed after 1993. The between-group component accounts for all of the growth in male wage inequality between 1993 and 1999.

This analysis fails to identify the different patterns of changes in wage inequality across subperiods. First, in the both periods between 1983 and 1987 and between 1987 and 1993, the within-group component accounts for about two-thirds of increase in total variance even though these periods have different patterns of the changes in wage distribution. Second, this result indicates that the increase in inequality after 1993 have stemmed from increase in observable factors such as skill prices and quantities. We are not sure, however, whether it is due to observable prices or quantities.

The full-sample distribution accounting scheme developed by Juhn et al. (1993) is a useful approach to examine which is the source of inequality[14]. This approach also use a simple wage equation (1). The method conceptualizes the residual as two components: an individual's percentile in the residual distribution, θ_{it},

[14] Another merit of this approach is that it allows one to decompose not only variance but also other inequality measures such as differences between 90^{th}-0^{th} and 50^{th}-10^{th} percentiles.

and the distribution function of the residuals, $F_t(\ )$. By the definition of the cumulative distribution function, we have

(3) $u_{it} = F_t^{-1}(\theta_{it} \mid X_{it})$,

where $F_t^{-1}(\ .\ \mid X_{it})$ is the inverse cumulative residual distribution for workers with characteristics X_{it} in year t. Using equation (3), we rewrite equation (1) as

(4) $y_{it} = X_{it}\beta_t + F_t^{-1}(\theta_{it} \mid X_{it})$.

To decompose actual wage differentials into three components, observed quantities, skill prices, and unobservables, first we construct the hypothetical wage distributions that would keep some of the components fixed. Let define β be the average returns to observables over the whole period under study and $G^{-1}(\ )$ be the average inverse cumulative distribution of $F_t^{-1}(\ )$ for each percentile of residual distribution over time[15]. If only observable quantities are allowed to vary with skill returns and the residual distribution held fixed, then wages would be determined by[16]

(5) $y_{it}^1 = X_{it}\beta + G^{-1}(\theta_{it} \mid X_{it})$.

If both observable skill returns and quantities are allowed to vary over time with the residual distribution held fixed, then wages are generated by

(6) $y_{it}^2 = X_{it}\beta_t + G^{-1}(\theta_{it} \mid X_{it})$.

If all observable quantities, skill prices, and unobservables are allowed to vary over time, wages are generated as actual wage given in equation (4). Empirically, how the

[15] To get the average inverse cumulative function $G^{-1}(\ .\ )$, we estimate log wage equation (1) and store the residuals for each year. For each percentile, we get the average value of residual, u. The inverse cumulative distribution for each year, $F_t^{-1}(\ .\ )$, is merged by percentiles of the residual distribution, say 10^{th} percentile, and the average of residuals is taken for each percentile, say 10^{th} percentile, across time.

[16] Given that $G^{-1}(\ .\ )$ is the average of $F_t^{-1}(\ .\ )$ across time, the function $G^{-1}(\ .\ )$ is identical for each year. However, in order for the hypothetical distributions such as y^1 and y^2 to be calculated, the information of percentile of individual residual distribution for each year, θ_{it}, is used.

hypothetical distribution y^1 changes over time can be estimated by predicting wages for every individual in each year using the average coefficients, β, and computing a residual for each individual in each year based on his actual percentile in that year's residual distribution, θ_{it}, and the average inverse cumulative distribution, $G^{-1}(\,)$. The changes in the distribution y^2 over time can be estimated by predicting wages for every individual in each year using his observable characteristics (X_{it}) and computing a residual for each individual in each year based on his actual percentile in that year's residual distribution, θ_{it}, and the average inverse cumulative distribution, $G^{-1}(\,)$.

After predicting the whole distributions of y_{it}^1, y_{it}^2, and y_{it} for each individual and each year, we calculate inequality measures such as the differences between 90th-10th, 90th-50th, and 50th-10th percentiles in the distribution for y_{it}^1, y_{it}^2, and y_{it} for each year. The change through time in inequality in y_{it}^1 is due to the changes in observable quantities. Additional change in inequality in y_{it}^2 beyond the change in inequality in y_{it}^1 is attributable to the changes in observed skill prices. Further changes in inequality for y_{it} beyond the change in inequality in y_{it}^2 are due to the change in inequality in unobservables. The contributions of each component to changes in wage distribution are calculated for three subperiods.

The results are summarized in Table 1-7 which provides the changes in 90th-10th, 90th-50th, and 50th-10th percentiles log wage differentials (column 2) and the contributions of three components to changes in the distributions of log wage

(columns 3-5)[17]. Panel A in Table 1-7 refers to the change over the period 1983-87. Observed quantities contribute to half of the rise in the 90^{th}-10^{th} differentials. Observed quantities are less important below the median (34%), while observed quantities are major contributor to increase in wage inequality above the median (78%). The contributions of observable skill prices are relatively small during 1983-87, which are about 10% in the distribution both below and above the median. Though increases in residual inequality account for one third of the rise of the 90^{th}-10^{th} wage differentials, this component has a very different impact on the wage distribution above and below the median. The unobserved component accounts only for 10% of the increase in inequality above the median but for 54% below the median.

In the 1987-93 period (Panel B), the component of observable quantities explains most of the increase in 90^{th}-10^{th} wage differentials. In the upper half of the distribution, inequality in observed quantities is even more important contributor to the increase in inequality, while observed quantities contribute to *decrease* in inequality below the median. In this period, observed skill prices contributed to decrease in wage inequality both above and below the median. To the contrary, increase in inequality in unobservables contributed to the increase in inequality below the distribution.

The period between 1993 and 1999 (Panel C) can be characterized very differently. After 1993, the component of observed quantities has very small impact on increase in wage differentials above the median (3%) and largely contribute to

[17] The experiment that the residual distributions are divided into 1000 instead of 100 to get θ_{it} gives the similar result as that in Table 1-7.

decrease in wage differentials below the median. It is the component of observed skill prices that accounts for the dominant portion of the increase in wage differentials, especially above the median. After 1993, the contribution of unobservables to increase in wage inequality above the median, therefore, is less important.

5. Explaining Increase in Wage Inequality

The decomposition results in the previous section show that the major component increasing wage inequality after 1993 is observed skill prices, which is different from that before 1993. Given that the skill premium increases significantly after 1993, we hypothesize that the major cause of accelerating wage inequality is due to the increase in demand for skilled labor. In order to examine this hypothesis, we measure changes in labor demand by the fixed-coefficient manpower requirements index (Katz and Murphy 1992).

The basic framework of this measure starts with an aggregate production function with K types of labor inputs. We assume the associated factor demands can be written as $X = D(W,Z)$, where X is a vector of labor inputs employed, W is a vector of market prices of these inputs, and Z is a vector of demand shift variables such as changes in technology and product demand. Taking differentials of factor demand yields $dX = D_w dW + D_z dZ$, where D_w is partial derivative of factor demand function with respect to W. The negative semidefiniteness of D_w implies that

(7) $dW'(dX - D_z dZ) = dW' D_w dW \leq 0$.

Equation (7) shows that changes in wages and changes in net factor supply negatively covary. If factor demand is stable (Z fixed), wage for a labor group decreases with increase in relative supply of the labor due to such as changing demographics and educational attainments in the labor market.

Consider an economy consisting of J industries to capture two kinds of shifts in demand for skilled labor: a shift generated between industries (a shift to industries using more skilled workers) and a technological shift within industries (a shift to technology using the skilled labor). Let Y_j be output in industry j assuming that production takes place under constant returns to scale in all industries. The vector of factor demands in sector j, X_j, can be written as

$$(8)\ X_j = C_w^j(W)Y_j,$$

where $C_w^j(W)$ is the partial derivatives of the unit cost function in industry j with respect to each labor group's own wage. Taking total derivative of equation (8) yields

$$(9)\ dX_j = C_w^j(W)dY_j + Y_j C_{ww}^j(W)dW,$$

where $C_{ww}^j(W)$ is the second partial derivatives of the unit cost function.

Aggregating equation (9) across industries gives

$$(10)\ dX = \sum_j X_j \frac{dY_j}{Y_j} + C_{ww}^j(W)dW$$

$$= \sum_j X_j \frac{W'dX_j}{W'X_j} + C_{ww}^j(W)dW.$$

The second equality holds since $\frac{dY_j}{Y_j} = \frac{W'dX_j}{W'X_j}$, which is derived from equation (8).

Equation (10) implies that

$$(11)\, dW'(dX - \sum_j X_j \frac{W'dX_j}{W'X_j}) = dW'C^j_{ww}(W)dW \leq 0.$$

This is the same form as equation (7) and we find that a between-sector demand shift, ΔD, is measured as

$$(12)\ \Delta D = \sum_j X_j \frac{W'dX_j}{W'X_j}$$

$$= \sum_j X_j \frac{dY_j}{Y_j}.$$

To measure this demand shifts, we divide the economy into 12 industries and 3 occupation categories and take this 36 industry-occupation cells as "sectors" indicated by j. The reason why occupation categories within industry are added is to capture within-industry shifts in labor demand as well as between-industry shifts. Columns 1 to 4 in Table 1-8 indicate the changes in industrial composition over time[18] while the remaining columns give the average fractions of workers in the bottom and top 10 percent of the wage distribution employed in each industry[19].

There are some shifts out of manufacturing (except machinery and chemical) and agriculture, and into professional services and retail. These change in industrial

[18] Overall industrial distribution is calculated from labor inputs of all productive workers (including self-employment), which is measured as sum of number of days per week for each industry or occupation.

[19] Industrial distributions for top and bottom wage percentiles are calculated by using wage/salaried workers only since the wage information for self-employed workers are not available.

composition are suggestive of a demand shift in favor of more educated workers. In addition, as shown in the last two columns, skill composition differs across industries.

For example, the proportion of workers employed in agricultural sector is 17% in the lowest 10 percentile group while it is only 2% in the top 10 percentile group. In professional service sector, the proportion was 2 % in the lowest deciles and 8% in the top deciles. As a result, shifts in industrial composition are expected to capture changes in relative demand.

Empirical demand shift measure used here corresponds to the index ΔD in equation (12), and is calculated for each skill group k, which is categorized by each 5 percentiles in the wage distribution[20]. The demand shift index for skill group k is measured relative to base year employment of group k, E_k, as

$$(13)\ \frac{\Delta D_k}{E_k} = \sum_j \frac{E_{jk}}{E_k}\frac{\Delta E_j}{E_j} = \frac{\sum_j \alpha_{jk}\Delta E_j}{E_k},$$

where E_j is total labor input in sector j, and $\alpha_{jk}=E_{jk}/E_j$, skill group k's share of total employment in sector j in a base year. This indicates that the percentage change in the demand for a skill group k is measured as the weighted average of the percentage employment growth by industry where the weights are the industrial employment distribution for the skill group in the base period. Therefore skill groups employed largely in expanding industrial sectors will experience rising demand.

Equation (13) is turned into an index of relative demand shifts by normalizing all employment measures so that total employment in each year sums to one. As base

[20] For convenience, we name the least skilled group "skill group 1" and the most skilled group "skill group 20". For example, skill group 1 refers to the workers in the bottom 5 percentiles in the wage distribution and the wage of skill group 2 ranges between 6 and 10 percentiles in the wage distribution, and so on.

year, the average of 1983-1999 employment shares is used. Therefore average share of total employment in sector j of skill group k over the 1983-1999 periods as the measure of α_{jk} and the average share of group k in total employment over the 1983-1999 periods as the measure of E_k.

For the purpose of comparison across subperiods, the percentage change in relative demand for each skill group is separately measured for three subperiods in Figure 1-6. Between 1983 and 1987, shown in Panel A, the demand shift is moderate. Demand for workers below 80th percentile decreases by no more than 1 percent, though demand for workers in the top 15% of the wage distribution increased by 2-7 percent. In the period 1987-1993 (Panel B), demand for the top 10 percentile skill groups increases significantly. Demand for workers in the bottom 20 percent (skill groups 1 to 4) has no change while demand for workers in between 20th and 80th percentiles skill groups decreases by 1-2 percent. The shift in demand between 1993 and 1999 shown in Panel C is similar to that in Panel A with larger demand increase in the top 20 percent (skill groups 17-20) and more significant decline in demand for the bottom 15 percentile skill groups. It is suggestive that growing demand for the most skilled is an important factor leading to the growth in skill premium.

This finding that increase in labor demand between 1983 and 1987 was relatively small is consistent with the evidence that employment in factory sector[21] declined in the 1980s even though the output was accelerated (Bhalotra 1998). It is

[21] The factory sector is also known as registered manufacturing sector, which consists of firms with at least 10 workers with power-operated machines or 20 without.

argued that this employment decline in the 1980s is due to job security legislation[22]. Since the job security legislation requires employers to seek permission of the state government before they dismiss an employee, labor regulation can discourage firms to hire workers[23]. Although it is known that even in the 1990s, the labor market reform has progressed slowly due to opposition from trade unions (Kambhampati and Howell 1998), there are some indications that the economy has become more competitive, which may change the employers' attitudes to demand for labor[24]. This may suggest that the relatively larger demand shift in the 1990s than between 1983 and 1987 can be explained by such changes in regulatory environments in the 1990s.

In order to verify this argument, we make two or three groups of the states depending on their regulatory environments and then measure the shift of labor demand index separately for these groups. Though it is difficult to measure the regulatory environment, there are several studies which try to capture the differences across states. Using the fact that state governments are given the right to amend the act, Besley and Burgess (2002) classified each amendment to the Industrial Disputes Act of 1947 as pro-worker, pro-employer, or neutral, depending on whether workers or employers benefited or whether the legislation had no appreciable impact on either group. The measure of the labor regulatory environment is constructed by coding

[22] This legislation was introduced in 1976 and applied to firms with at least 300 employees. In 1982, the job security provision was extended to establishments with at least 100 employees (additional 15% of workers were covered).

[23] Fallon and Lucas (1991) examine the effect of job security regulation on employment in factory sector by comparing before and after 1976 when government permission was required for dismissal in firms with more than 300 employees. They find that the 1976 change in legislation reduced long-run employment by 17.5 percent on average.

[24] There are 45 labor laws in operation in the end of 1990s, enforced by the central and state governments, regulating employment, minimum wages, benefits, job security, dismissal, industrial safety, disciplinary actions, industrial disputes, formation of trade unions, and collective bargaining. The number of union membership and unions declined and the use of voluntary retrenchment scheme (golden handshakes), contract labor, and lockouts has became more flexible after 1991 (Zagha 1999).

each pro-worker amendment as a one, each neutral amendment as a zero, and each pro-employer amendment as a minus one. By this method, three groups are formed and classified as "pro-employer", "pro-worker", and "neutral" states[25].

The other classification is based on attractiveness of investment (Weiner 1999). The attractiveness includes factors necessary for doing business such as the regulatory climate, the presence of a relatively low level of administrative interference or corruption, the quality of the local workforce, and the availability of electric power. By analyzing the policies of state governments and the flows of investment especially in the 1990s, Weiner (1999) considers states of Gujarat, Karnataka, Tamil Nadu, and Maharashtra as the states with more active deregulations. Thus we can consider the classification by Besley and Burguess (2002) more focused on labor regulatory environment in the factory sector in the 1980s and Weiner's classification more general regulatory environment in the 1990s.

Figure 1-7 graphs the demand shift index during 1983-87 for pro-employer, pro-worker, and neutral states based on the classification of Besley and Burgess (2002). As Panel A shows, pro-employer states had large demand increases during 1983 and 1987 while pro-worker states had very small increases in demand for skilled workers (Panel B). For neutral states, there is no indication for increasing demand for skilled workers (Panel C).

Figure 1-8 shows the demand shift index during 1987-1999 following Weiner's classification. During 1987 and 1993, the demand for the most skilled

[25] Six states such as Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Rajasthan and Tamil Nadu are classified as "pro-employer", four states such as Gujarat, Maharastra, Orissa and West Bengal as "pro-worker", and the rest of the states where there were no changes in amendment in a pro-worker or pro-employer direction over 1958-1992 as "neutral" states.

workers significantly increased in the states with more active deregulation (Panel A-1) while there seems to be little increase in demand for labor in the other states (Panel B-1). Between 1993 and 1999, the demand for skilled workers increased in both groups of states (Panel A-2 for states with more active deregulation, Panel B-2 for the other states). This may be the case, as Bhalotra (1998) mentioned, that increased competition might have forced firms to adjust employment more flexibly after the late 1980s and thereby the shift in demand for skilled workers increased more significantly in the 1990s.

In sum, we find some differences in growth rate of demand for skilled labor due to state-level differences in labor regulation. Such differences, however, are not always be found, especially after 1993. Increase in demand for skilled labor seems to be all-India trends. The causes of this increase in demand for skilled labor are likely to be skill-biased technological change. Increase in computer use and policy changes favorable to export oriented hi-tech industries might change comparative advantage in India, which would shift the economic composition. Such changes could have increased demand for skilled labor. Further analysis must be done for finding the cause.

6. Changes in Skill Prices and Demand and Supply Factors

The analysis in the previous section suggests that growing demand for the most skilled is an important factor leading to the growth in skill premium in the 1990s. In this section, we proceed our analysis further by separating "skill" into education and

experience. Figure 1-9 graphs three skill prices for education, experience, and within-group skills.

The price series were derived from yearly regressions of log weekly wages on education and experience effects[26]. Within-group skill price is approximated by the 90^{th}-10^{th} percentile log wage differential from the regression residuals. The education skill price is defined as an average of the tertiary-secondary school log wage differential. Skill prices for experience are constructed from the average log wage differential within education levels between the 21-30 and 1-10 years of experience groups. These skill prices are indexed to 1983 levels.

It is interesting to note that the timing of increase in prices differs by skills. Experience price and within-group skill price start increasing in 1983, with smaller increase in within-group price and with relatively larger increase in experience price after 1987. In contrast, education price decreases slightly between 1983 and 1987, and starts increasing in 1987, with a large increase after 1993.

These changes in skill price can be largely affected by changes in both demand for and supply of skills. When we measure labor supply for each educational group as summation of total working days for the group, relative supply of tertiary school graduates to below-tertiary school graduates increased from 0.12 in 1983 to 0.29 in 1999, with a small increase after 1993 (Figure 1-10). To examine whether the increase in educational skill premium after 1993 was driven by increase in relative demand for more-educated workers, we construct a demand shift index, following Autor, Katz, and Krueger (1998).

[26] The regression results are provided in Appendix Table 1-1.

Consider a CES production function for aggregate output with two factors, skilled labor (s) and unskilled labor (u):

(14) $Q_t = [\alpha_t (a_t N_{st})^{\rho} + (1-\alpha_t)(b_t N_{ut})^{\rho}]^{1/\rho}$,

where N_{st} and N_{ut} are the quantities employed of skilled labor and unskilled labor in period t, a_t and b_t represent skilled and unskilled labor augmenting technological change, α is a time-varying technology parameter that can be interpreted as indexing the share of work activities allocated to skilled labor, and ρ is a time invariant production parameter. Skill neutral technological changes raise a_t and b_t by the same proportion. Increases in α_t can be viewed as extensive skill biased technological change which shifts tasks from unskilled to skilled workers.

Under the assumption that skilled and unskilled workers are paid their marginal products, we can use equation (14) to solve for the ratio of marginal products of the two labor types yielding a relationship between relative wages in year t, w_{st}/w_{ut}, and relative supplies in year t, N_{st}/N_{ut}, given by

(15) $$\frac{\partial Q_t / \partial N_{st}}{\partial Q_t / \partial N_{ut}} = \frac{\alpha_t a_t^{\rho} N_{st}^{\rho-1}}{(1-\alpha_t) b_t^{\rho} N_{ut}^{\rho-1}} = \frac{w_{st}}{w_{ut}}.$$

After taking logarithm of equation (15) and using the aggregate elasticity of substitution between skilled and unskilled workers given by $\sigma=1/(1-\rho)$, we get

(16) $$\log(w_{st}/w_{ut}) = \log(\alpha_t/(1-\alpha_t)) + \rho \log(a_t/b_t) - (1/\sigma)\log(N_{st}/N_{ut})$$

$$= (1/\sigma)[\sigma \log(\alpha_t/[1-\alpha_t]) + (\sigma-1)\log(a_t/b_t) - \log(N_{st}/N_{ut})].$$

If we write the terms measuring technological changes shown in the first two terms in the right hand side of the equation (16) as D_t, the equation (16) is written as

(17) $\log(w_{st}/w_{ut}) = (1/\sigma)[D_t - \log(N_{st}/N_{ut})]$,

where D_t indexes relative demand shifts favoring skilled workers. The impact of changes in relative skill supplies on relative wages depends inversely on the magnitude of aggregate elasticity of substitution between the two skill groups. The greater is σ, the smaller the impact of shifts in relative supplies on relative wages and the greater must be fluctuations in demand shifts to explain any given time series.

Solving equation (17) for D_t gives

$$(18)\ D_t = \log([w_{st}N_{st}]/[w_{ut}N_{ut}]) + (\sigma - 1)\log(w_{st}/w_{ut}).$$

This shows that relative demand for skilled workers depends on relative wage bill and wage premium of skilled labor. Wage premium, therefore, is positively correlated with relative demand when aggregate elasticity of substitution between skilled and unskilled labor is greater than unity.

To construct this relative demand shift index, we consider two types of skill groups: (1) tertiary school graduates as skilled labor and (2) non-tertiary school graduates as unskilled labor. The total wage bills for tertiary and non-tertiary school graduates can be calculated from individual data on employment and earnings[27]. The tertiary/non-tertiary school wage premium is estimated in each year from a standard log wage equation[28]. The composition-adjusted log relative supply of tertiary to less than tertiary school graduates is calculated as the change in log relative wage bill minus the change in the regression-adjusted log relative wage:

$$\log(N_{st}/N_{ut}) = \log([w_{st}N_{st}]/[w_{ut}N_{ut}]) - \log(w_{st}/w_{ut}).$$

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[27] Total labor days for tertiary school graduates during the survey reference week (N_{st}) are calculated from all workers graduated from tertiary school whose age ranges between 21 and 65 in paid employment, which include both wage/salaried jobs and self-employed.

[28] Wage equation is regressed on education dummies for primary, secondary, and tertiary graduates and a quadratic in experience fully interacted with the education variables. The results are shown in Appendix Table 1-1.

Although the aggregate elasticity of substitution between tertiary- and below-tertiary-school graduates should be estimated for Indian labor market, available time series data on the wage premium and on the relative quantities of tertiary- and below-tertiary-school graduates in India are not long enough to do so. Thus, we apply the estimates of σ for the US[29] and provide the implied relative demand shift measures for $\sigma = 1$, 1.4, and 2.

Table 1-9 compares changes in the growth of relative wage, supply and implied demand with $\sigma = 1$, 1.4, and 2. Before 1993, the change in relative wage is very gradual, while wage premium for tertiary-school graduates increases at 1.8 percent per annum after 1993. In contrast, the growth rate of log relative supply of tertiary graduates and the implied demand for $\sigma = 1$ decreases over time. If we use $\sigma = 1.4$ and 2, the growth rate of relative demand is found to be faster during 1993-1999 than during 1987-1993 even though the growth rate of relative supply after 1993 is much slower than that before 1993.

Thus, the marked increase in the growth rate of tertiary relative wage after 1993 seems to be attributed to both the slower relative supply growth and the sustained relative demand growth for tertiary school graduates. The small change in relative wage between 1987 and 1993, in contrast, might be because relative supply of tertiary graduates increases at almost same rate as relative demand for tertiary school graduates in urban labor market, which compresses the wage premium for tertiary-school graduates[30].

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[29] The studies for the US find that σ is likely to be between 1 and 2, with an emerging consensus "best guess" estimate of approximately 1.4 to 1.5 (Katz and Autor 1999).

[30] The experiences from other counties tell us that the expansion of educated workers can have negative impact on returns to education. In Costa Rica, for example, the return to education fell by

The cause of significant change in experience price after 1987 is less clear-cut. Though the relative labor supply of workers with 21-30 to 1-10 years of experience increases from 1.90 in 1983 to 2.12 in 1987, it turns to be stable after 1987. This means that increase in younger workers in the labor market should not be the reason for increasing the experience price[31]. As Freeman (1975) hypothesizes that changes in the labor market show up most sharply for new entrants, the decrease in demand for less-educated workers might have a severe impact on young less-educated males, which increases the experience price.

Combined with the decline of demand for fresh employment, the proportion of casual employees as opposed to regular salaried workers increases over time in urban India (Deshpande and Deshpande 1998). As Table 1-11 shows, this "casualization" in the labor force is found more intensively in younger cohorts. The proportion of casual labor in the age 21-30 cohort increases dramatically from 22% in 1983 to 29% in 1999, while the proportion in the age 41-50 cohort is relatively stable in the 1980s and 1990s. Since the growth rate of wage for casual labor is likely to be slower than that for regular salaried workers, the experience price might increase. The further investigation, however, must be made to understand the trend of the experience price.

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about one-fourth from the late 1970s to the mid-1980s because of rapid increase in post-secondary graduates (Funkhouser 1998). Similarly, Angrist (1995) found that large increases in the size of the educated Palestinian labor force compressed wage differentials by more than half between high school and college graduates in Gaza strip. Topel (1997) shows that the enrollment rate of age 18-22 cohort in college as a measure of human capital investment in the US and Sweden was positively correlated with changes in relative wages.

[31] In contrast, in the US, the long-term growth in experience differentials is consistent with the long-term increase in the share of young equivalent workers in the labor market (Katz and Murphy 1992).

7. Conclusion

In this paper, we found the increase in wage inequality among male workers in urban India over the past two decades. Different from the findings on consumption inequality which is found to increase in the 1990s but not in the 1980s, wage inequality started increasing even before 1991 when economic reform initiated. The increasing wage income inequality before 1993 was accounted for by the unequal distribution of observed skills, while the rise in wage inequality after 1993 was mainly due to increases in the premium on skills acquired from observed factors.

In all likelihood, accelerating skill premium is attributable to the increase in demand for skilled workers in the process of economic reform in India. Indeed, we found that the demand for skilled workers rose faster in more recent subperiod. Related with the economic reforms, the demand shift index calculated separately for the states with more or less active deregulation shows that regulatory environment seems to have some impact on labor demand, but not all the time. After 1993, the demand for skilled workers seems to increase in both groups of states with more and less deregulations.

It is possible and likely that inequality in urban India continues to increase without undertaking corrective measures. However, policy makers should not rely on the policies that artificially compress the wage differences across skill groups since they could reduce human capital investment and, therefore, may have a negative effect on long-run growth. Increase in skill premium in the 1990s is expected to stimulate further increases in human capital investment (Topel 1999) and the increase in college graduates can decrease the wage inequality in the long run as Korean

experience in the 1970s and 1980s shows (Kim and Topel 1995). However, it is often the case that inter-generational mobility of educational status tends not to be pro-poor for secondary- and tertiary-school levels because only children born in households with educated parents and decent assets can afford to complete secondary- and tertiary-schools (Filmer and Pritchett 1999, Lillard and Willis 1994, Vashishtha 1993). The policies which can facilitate the schooling investment of the poor are also crucial for decreasing wage inequality in India.

Skill-intensive demand shift after 1993 is also worrisome to the extent that labor market rigidities and distortions due to labor laws and government policies can make unskilled labor relatively costly, which deters firms from hiring them. For example, the current policy giving the rights of producing large range of labor intensive goods only to small industries seems to damage the development of labor intensive manufactured exports in India (Acharya 2002). There is no doubt that more flexible functioning of the labor market is urgently looked for. In order to achieve equitable growth in India, it is urgent to explore how labor markets function and what their implications are for the income distribution.

Figure 1-1 Indexed Real Weekly Wage for Urban Male Workers, 1983-1999 (Male Wage Labor Working At Least 5 Days A Week)

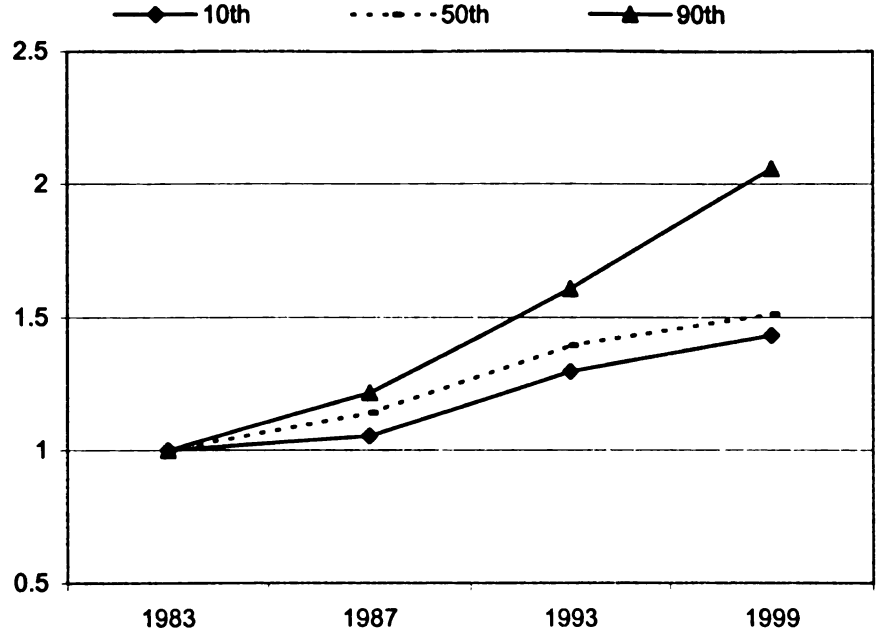


Figure 1-2 Log Real Wage Changes by Percentile, 1983-1999

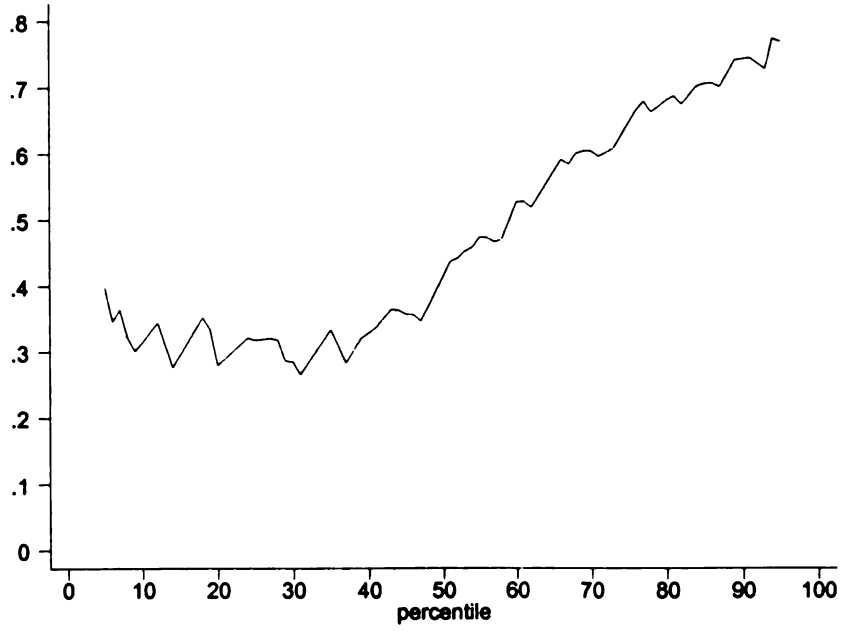
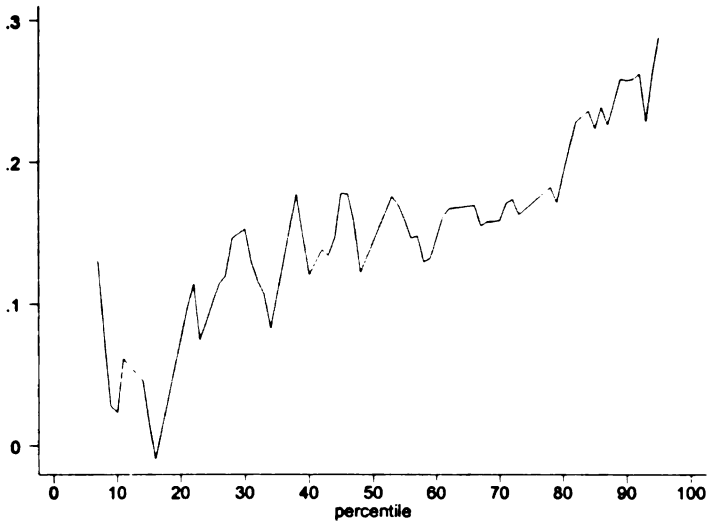
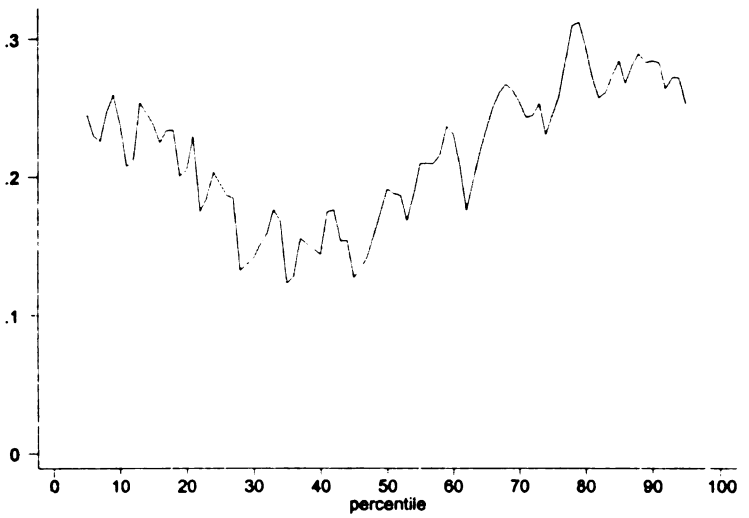


Figure 1-3 Changes in Log Wages by Subperiod

A. 1983-1987



B. 1987-1993



C. 1993-1999

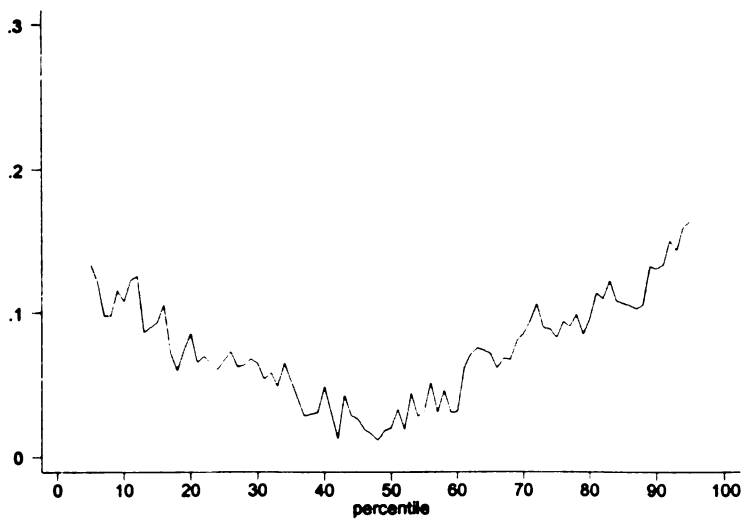


Figure 1-4 Log Real Wage Changes by Experience Group, 1983-1999

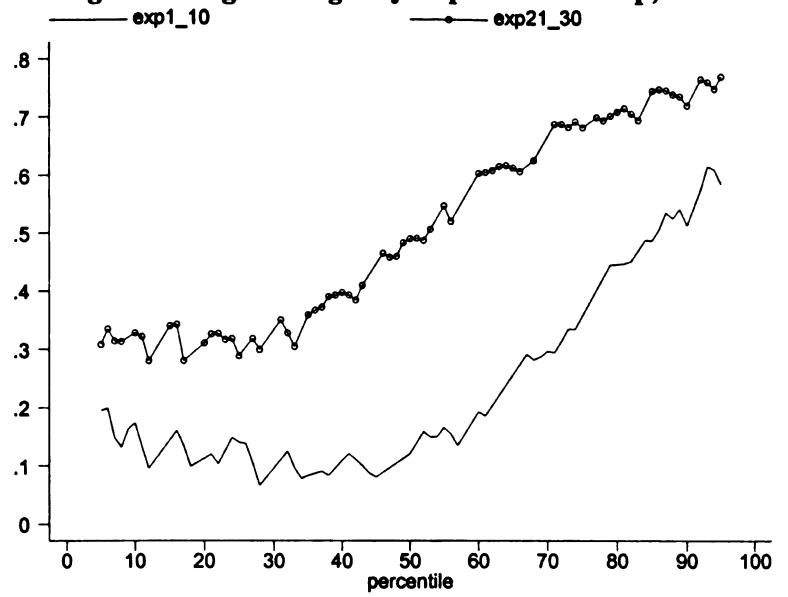


Figure 1-5 Log Real Wage Changes by Education, 1983-1999

A. Experience 1-10 years

B. Experience 21-30 years

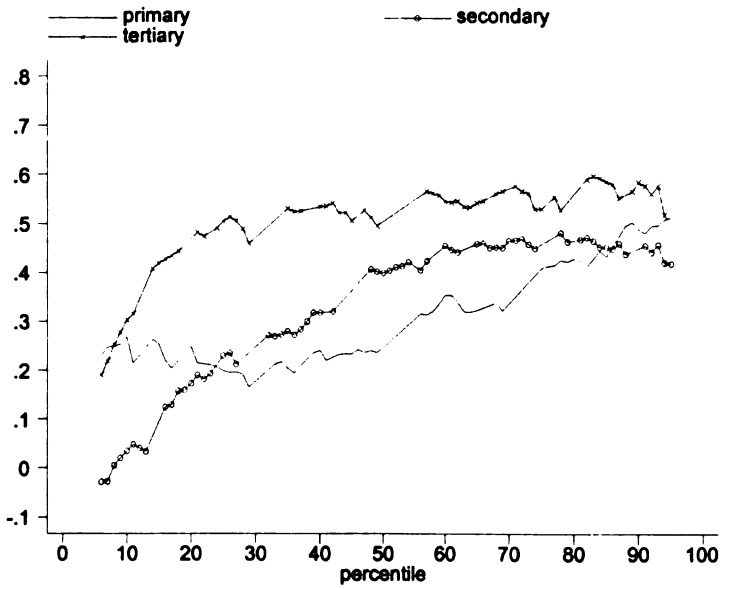
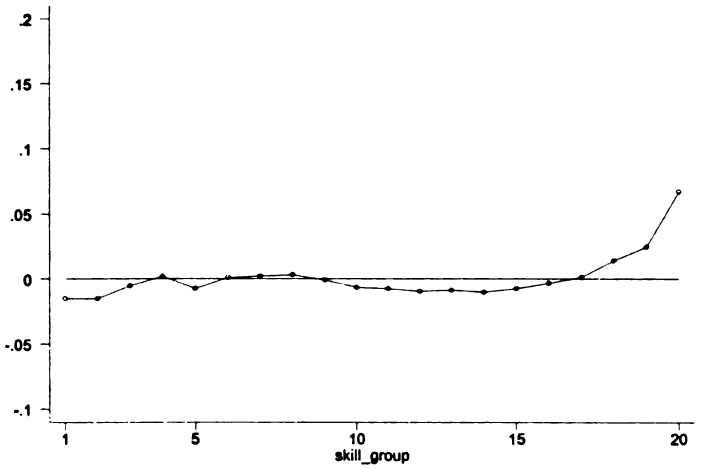
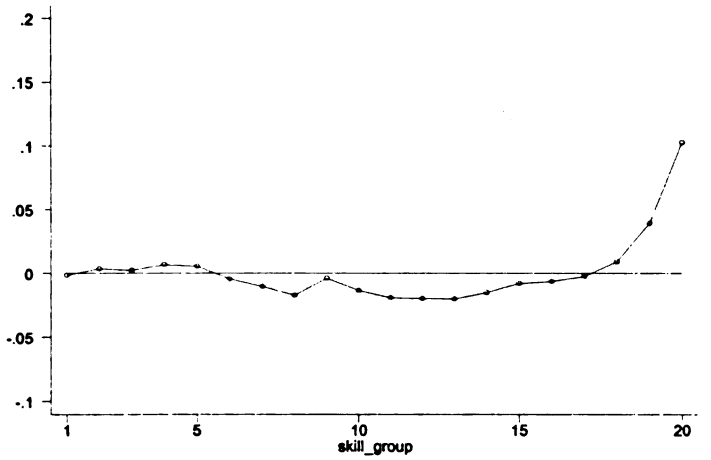


Figure 1-6 Demand Shift Index for Skilled Labor by Subperiod

A.1983-1987



B. 1987-1993



C. 1993-1999

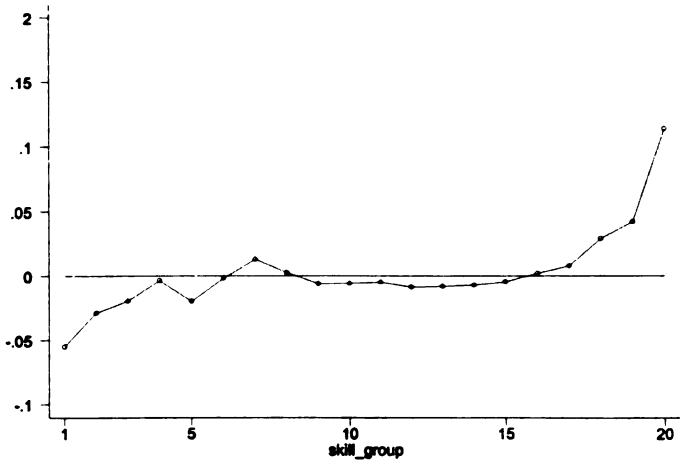
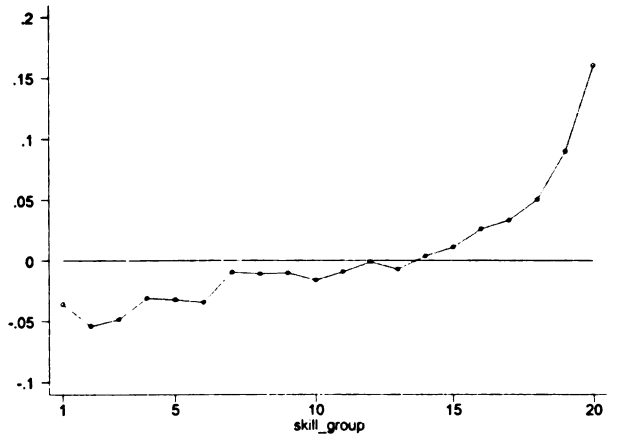
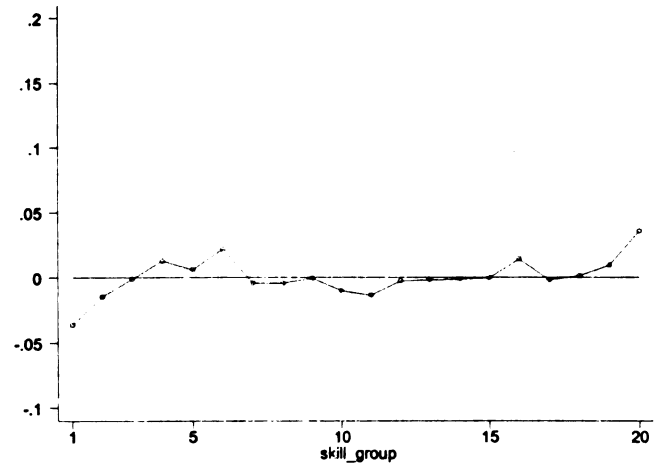


Figure 1-7 Demand Shift Index by State with Different Regulatory Environment, 1983-87

A. Pro-employer states



B. Pro-worker states



C. Neutral states

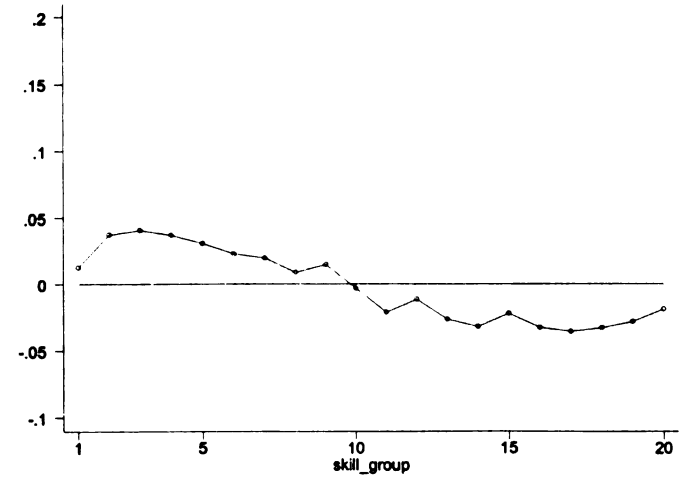
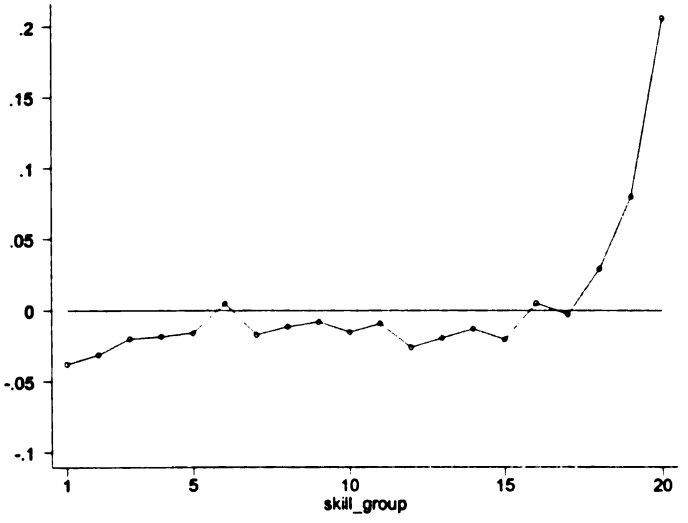
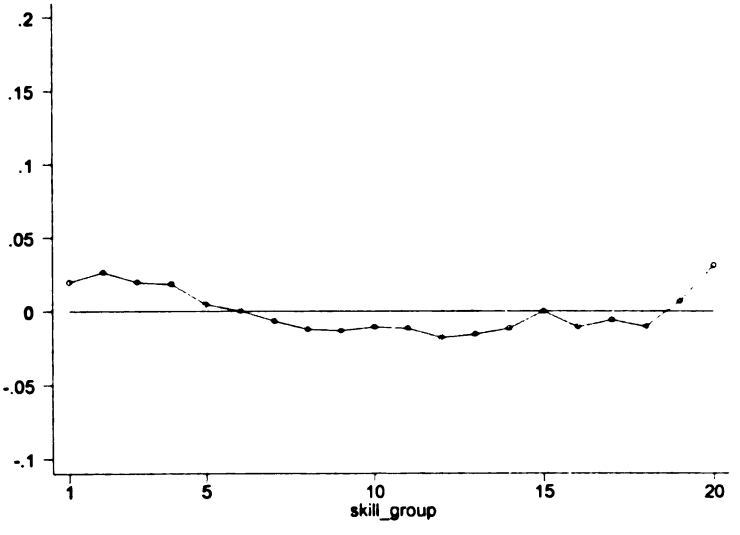


Figure 1-8 Demand Shift Index by State with Different Regulatory Environment, 1987-99

A-1. States with more active deregulation: 1987-1993



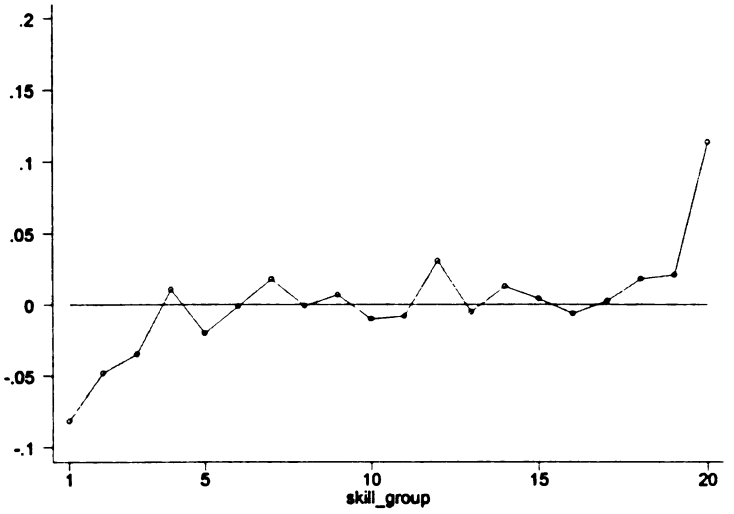
B-1. States with less active deregulation: 1987-1993



continued.

Figure 1-8 Demand Shift Index by State with Different Regulatory Environment, continued.

A-2. States with more active deregulation: 1993-1999



B-2. States with less active deregulation: 1993-1999

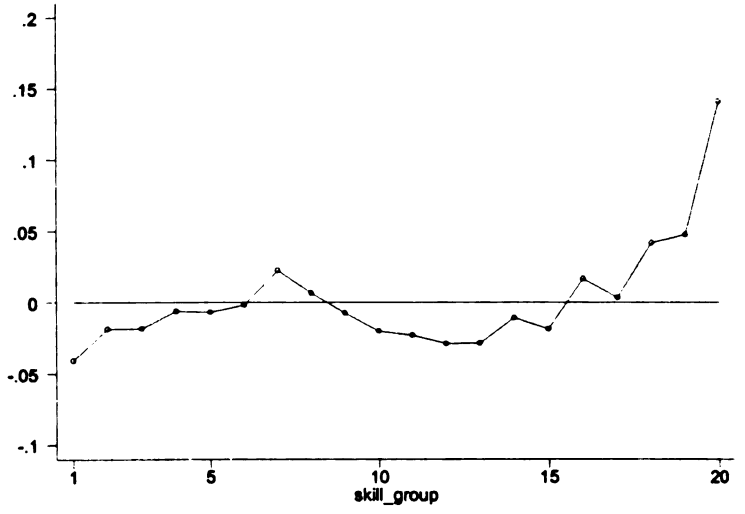


Figure 1-9 Skill Price Index

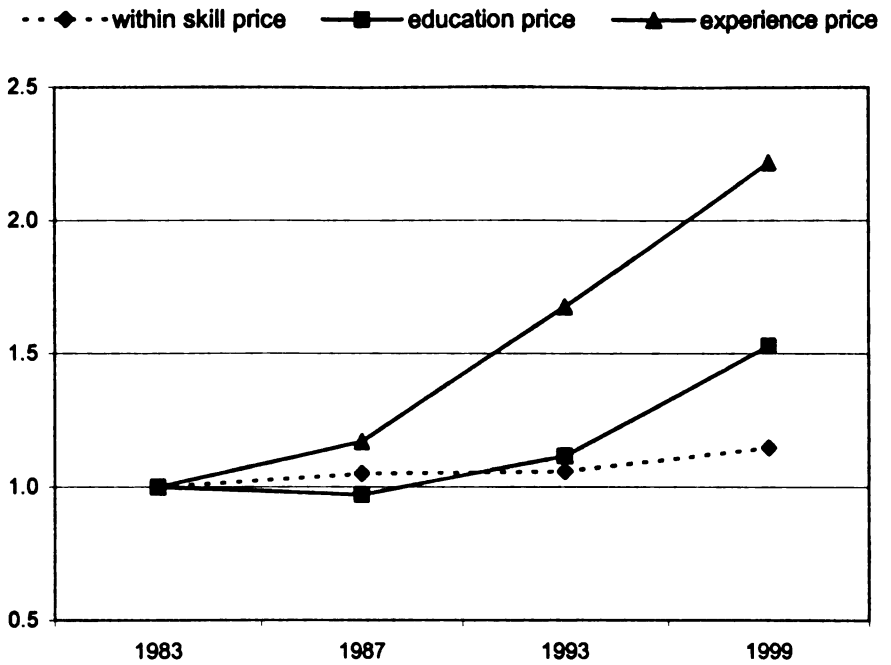


Figure 1-10 Change in Relative Supply of Tertiary to Non-Tertiary School Graduates in Labor Force

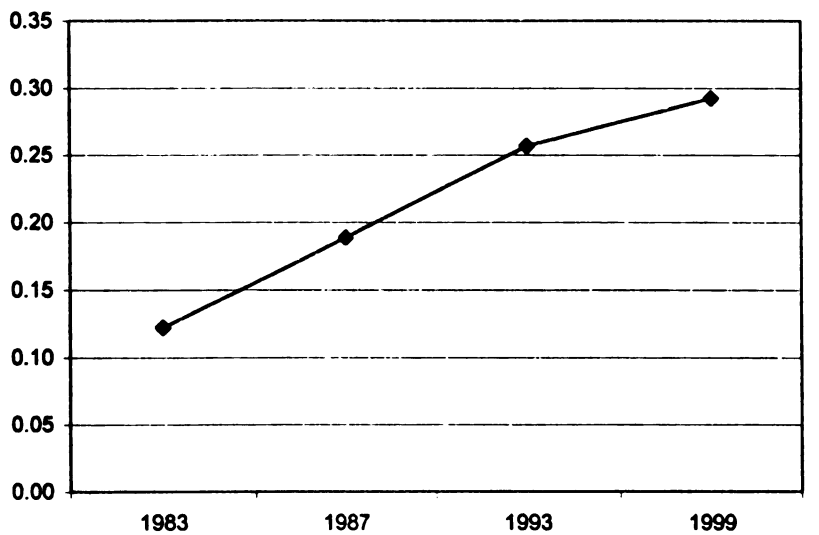


Table 1-1 Change in Employment Structure for Age 21-65 Urban Labor Force

	Male				Female			
	1983	1987	1993	1999	1983	1987	1993	1999
Wage/salaried	54.23	52.93	52.44	51.57	12.89	12.35	12.89	12.05
Self-employed	34.59	35.32	33.99	36.03	7.35	7.47	7.14	7.22
Student	2.36	2.80	3.10	3.03	0.90	1.04	1.50	1.83
Other	8.82	8.94	8.47	9.37	78.86	79.14	78.47	78.90

Note: The numbers are proportion (%) of labor force categorized as each employment status. "Other" includes persons attending domestic duties, rentiers, pensioners, remittance recipients, beggars, prostitutes, persons who are not able to work due to disability.

Table 1-2 Change in Age and Educational Structure in the Wage Sample

	1983	1987	1993	1999
Age 21-30	37.86	35.10	31.97	32.53
Age 31-40	31.20	32.20	33.96	33.40
Age 41-50	21.35	22.35	23.28	23.38
Age 51-65	9.59	10.35	10.78	10.68
Experience 1-10 years	13.15	11.72	11.49	13.00
Experience 11-20 years	37.51	35.86	34.56	34.50
Experience 21-30 years	29.31	32.14	33.07	31.97
Experience 31-40 years	20.04	20.28	20.88	20.53
Below primary	28.31	27.72	25.33	21.66
Primary	32.98	30.81	28.07	27.93
Secondary	24.29	25.38	26.85	28.85
Tertiary	14.42	16.09	19.75	21.56

Note: Figures are indicated in %. Wage sample includes the male urban workers who are aged 21-65, work full time (work at least 5 days a week), are not self-employed, and do not attend school. Years of experience is calculated by subtracting years of education plus 5 from age. The proportion by experience groups is calculated only for the workers with experience less than and equal to 40 years. "Below primary" includes workers with no education, some education but not completed primary school. "Primary" refers to workers with completed primary or above but not completed secondary. "Secondary" and "Tertiary" means secondary and tertiary school graduates, respectively.

Table 1-3 Inequality Measures for Log Weekly Wages of Urban Male Workers

	Standard deviation	Percentile differentials						Number of Obser-vations
		90^{th}–10^{th}*	75^{th}–25^{th}	90^{th}–50^{th}	50^{th}–10^{th}	75^{th}–50^{th}	50^{th}–25^{th}	
1983	0.72	1.63	0.92	0.73	0.90	0.41	0.51	21189
1987	0.77	1.78	1.00	0.83	0.96	0.46	0.54	21930
1993	0.80	1.85	1.06	0.90	0.95	0.52	0.55	21503
1999	0.83	2.00	1.16	1.07	0.93	0.61	0.56	22520
change								
1983-99	0.11	0.37	0.25	0.34	0.03	0.20	0.05	
1983-87	0.05	0.15	0.09	0.09	0.06	0.05	0.03	
1987-93	0.03	0.07	0.06	0.08	-0.01	0.06	0.00	
1993-99	0.03	0.15	0.10	0.17	-0.02	0.09	0.01	

Note: "90^{th} – 10^{th}" refers to log wage differential between the 90^{th} and 10^{th} percentiles.

Table 1-4 Inequality Measures on Regression Residuals, 1983-1999

	Percentile differentials					
	90th-10th	75th-25th	90th-50th	50th-10th	75th-50th	50th-25th
1983	1.28	0.64	0.57	0.71	0.30	0.34
1987	1.34	0.69	0.61	0.73	0.33	0.36
1993	1.35	0.69	0.59	0.76	0.32	0.38
1999	1.47	0.76	0.71	0.77	0.38	0.38
change						
1983-99	0.20	0.13	0.14	0.06	0.08	0.05
1983-87	0.06	0.05	0.05	0.02	0.02	0.03
1987-93	0.01	0.01	-0.02	0.03	-0.01	0.02
1993-99	0.13	0.07	0.12	0.01	0.06	0.01

Note: Residuals are estimated from separate log earning regression in years which include education dummies for primary, secondary, and tertiary graduates and a quadratic in experience fully interacted with the education variables.

Table 1-5 Changes in Inequality by Birth Cohort, 1983-1999

A. 90th-10th Percentile Log Wage Differentials

	1983	1987	1993	1999
Years of birth				
1925-29	1.83			
1930-34	1.79	2.01		
1935-39	1.72	1.98	1.99	
1940-44	1.60	1.72	1.94	2.29
1945-49	1.52	1.69	1.79	2.09
1950-54	1.55	1.67	1.79	1.98
1955-59	1.44	1.62	1.66	1.97
1960-64	1.39	1.71	1.64	1.88
1965-69		1.42	1.50	1.82
1970-74			1.40	1.62
1975-79				1.38

B. 90th-10th Percentile Regression Residual Differentials

	1983	1987	1993	1999
Years of birth				
1925-29	1.38			
1930-34	1.37	1.50		
1935-39	1.32	1.42	1.46	
1940-44	1.20	1.28	1.39	1.68
1945-49	1.16	1.31	1.32	1.52
1950-54	1.19	1.34	1.33	1.44
1955-59	1.29	1 31	1.29	1.49
1960-64	1.33	1.27	1.33	1.42
1965-69		1.30	1.35	1.51
1970-74			1.32	1.42
1975-79				1.34

Note: Figures in Panel A indicate the differentials between 90th and 10th percentiles of log weekly wage for each 5-year birth cohort. Figures in Panel B indicate the differentials between 90th and 10th percentiles of estimated regression residuals for each 5-year birth cohort.

Table 1-6 Between- and Within-Components of Change in Variance of Log Wages

	Changes in the variance components		
	Total change	Between-group change	Within-group change
1983-87	0.098	0.032	0.066
1987-93	0.034	0.013	0.022
1993-99	0.060	0.072	-0.012

Note: The between-group components (predicted values) and within-group components (residuals) of the variance of log weekly wages are based on yearly wage equation regressing on education dummies for primary, secondary, and tertiary graduates and a quadratic in experience fully interacted with the education variables.

Table 1-7 Observable and Unobservable Components of Changes in Inequality

Log Wage Differentials	Total change	Components		
		Observed quantities	Observed prices	Unobservables
A. 1983-87				
90^{th}-10^{th}	0.227	0.115	0.028	0.084
90^{th}-50^{th}	0.087	0.068	0.010	0.009
50^{th}-10^{th}	0.140	0.047	0.018	0.075
B. 1987-93				
90^{th}-10^{th}	0.081	0.086	-0.028	0.024
90^{th}-50^{th}	0.080	0.094	-0.015	0.000
50^{th}-10^{th}	0.001	-0.008	-0.013	0.024
C. 1993-99				
90^{th}-10^{th}	0.124	-0.065	0.144	0.045
90^{th}-50^{th}	0.153	0.004	0.126	0.023
50^{th}-10^{th}	-0.029	-0.069	0.018	0.022

Note: Column 1 gives the change in log wage differentials between 90th and 10th, between 90th and 50th, and between 50th and 10th percentiles. Components in columns 2 to 4 are calculated by the full distribution accounting scheme.

Table 1-8 Industry Distributions by Percentiles, 1983 and 1999

	1983	1987	1993	1999	Average 1-10 Percentiles	Average 91-100 Percentiles
Industry						
Agriculture/mining	9.48	8.19	8.42	6.90	17.04	2.12
Construction	4.74	5.12	6.20	7.49	7.02	6.23
Machinery	4.53	4.87	4.67	4.58	3.19	6.42
Chemical	1.85	1.86	2.25	2.22	1.17	4.50
Other manufacturing	20.25	19.34	16.75	15.44	21.48	19.19
Transportation/utilities	12.05	11.82	12.01	12.25	10.23	14.06
Wholesales	2.93	2.83	3.66	3.28	2.10	2.34
Retail	17.62	19.82	18.34	22.33	16.09	6.37
Professional services	3.55	3.91	4.27	4.71	2.26	7.81
Education/welfare	5.11	4.08	4.72	5.05	4.82	10.04
Public administration	11.18	11.12	10.19	9.00	3.27	18.08
Other services	6.71	7.03	8.52	6.74	11.35	2.88
Occupation						
Prof/tech. & managers	12.61	13.59	15.18	18.05	4.50	23.74
Sales & clerical	29.61	31.73	30.47	28.99	18.94	27.54
Production & service workers	57.78	54.68	54.34	52.96	76.57	48.73

Note: Professional services include financial, insurance, legal services, and computer related software consultancy. Overall industrial distribution is calculated from labor inputs of all productive workers (including self-employment), which is measured as sum of number of days per week. Industrial distributions for top and bottom wage percentiles are calculated by using wage workers. The proportions for the bottom and top percentiles are the means across 4 years.

Table 1-9 Changes in Tertiary-plus/Non-tertiary Graduates Log Relative Wages, Supply and Demand

	*Annual log Changes*100*				
	Relative wage	Relative supply	Implied relative demand $\sigma = 1$	$\sigma = 1.4$	$\sigma = 2$
1983-87	0.23	4.60	4.83	4.92	5.06
1987-93	0.18	2.12	2.30	2.37	2.48
1993-99	1.85	0.20	2.05	2.79	3.90

Note: σ is the aggregate elasticity of substitution between tertiary and non-tertiary graduates. Wage-bill shares, defined as the share of total weekly wages paid to each education group, is calculated for samples that include all workers ages 21-65 in paid employment (both wage and salary and self-employed workers) during the survey reference week for each sample.

Table 1-10 Proportion of Casual Wage Labor by Age Cohort

	1983	1987	1993	1999
Age21-30	21.90	23.76	27.66	29.45
Age31-40	14.73	15.63	17.66	22.04
Age41-50	13.55	11.78	14.36	15.43
Age51-65	15.96	13.95	16.21	16.24
Total	17.31	17.45	19.93	22.23

Note: The numbers are the fraction of casual wage labor over wage/salaried workers in each age cohort. Casual wage labor is defined as a person casually engaged in others' farm or non-farm enterprises and getting in return wage according to the terms of the daily or periodic work contract. Regular salaried/wage employee is defined as person getting in return salary or wages on a regular basis.

Appendix Table 1-1: Yearly Log Weekly Wage Equation by Ordinary Least Squares

	Year			
	1983	1987	1993	1999
Primary school graduate dummy	0.2170	0.2796	0.2236	0.2315
	(2.25)	(2.56)	(2.22)	(2.11)
Secondary school graduate dummy	0.6450	0.7131	0.5487	0.5331
	(6.15)	(6.61)	(5.89)	(5.14)
Tertiary school graduate dummy	1.1202	1.3455	1.2384	1.1718
	(10.13)	(11.66)	(12.61)	(11.28)
Experience (years)	0.0531	0.0590	0.0580	0.0501
	(9.75)	(8.69)	(10.95)	(8.07)
Experience squared	-0.0007	-0.0008	-0.0007	-0.0006
	(-8.97)	(-7.30)	(-9.38)	(-6.47)
Interaction terms				
Experience*primary dummy	0.0081	0.0015	0.0057	0.0090
	(1.24)	(0.18)	(0.81)	(1.11)
Experience*secondary dummy	0.0160	0.0176	0.0242	0.0258
	(2.17)	(2.23)	(3.54)	(3.01)
Experience*tertiary dummy	0.0153	-0.0048	0.0093	0.0266
	(1.79)	(-0.05)	(1.12)	(3.21)
Experience squared*prim	-0.0001	0.0001	-0.0001	-0.0001
	(-1.34)	(0.09)	(-0.55)	(-0.99)
Experience squared*secondary	-0.0003	-0.0004	-0.0004	-0.0003
	(-2.48)	(-2.84)	(-3.65)	(-1.91)
Experience squared*tertiary	-0.0003	-0.0001	-0.0003	-0.0005
	(-1.63)	(-0.04)	(-1.68)	(-2.73)
Constant	3.4853	3.4585	3.6602	3.7831
	(39.70)	(34.52)	(44.46)	(41.70)
Number of observations	21189	21931	21503	22536
R-squared	0.361	0.351	0.352	0.435

Note: The dependent variable is log weekly wage (Rupee in 1983). The numbers in parentheses are t-values. The comparison group is the people who are not completed primary or no education. Experience refers to the "potential" experience, which is calculated by subtracting years of schooling plus 5 from age.

CHAPTER III

ESSAY 2

Caste and Ethnic Inequality: Evidence from Rural India 1983-93

1. Introduction

It has been recognized in rural India that lower castes households and tribal minorities are more severely suffering from poverty. The castes and tribes that were economically weakest and historically subjected to discrimination and deprivation were identified in a government schedule as a target group of reservation policies. Despite such government reservation policies and rural development programs to raise the levels of living of scheduled castes (SCs) and scheduled tribes (STs), many studies report that the disparities of living standards from other social groups still remain (Drezé and Sen 2002, Rogaly et al. 2002, Mosse et al. 2002, Bhengra et al. 1999, Deshpande 2000, Thorat 2002).

While the analysis of castes and tribes in India has been the preserve of social scientists other than economists for a long time, recently there have been some attempts to measure the disparities in living standards[32]. Most of these studies, however, are limited to descriptive analyses and there are few econometric analyses on such disparities due to castes and tribes[33]. Therefore, it is not clear what makes the levels of living between SCs/STs and other majority households so different. While

[32] Nayak and Prasad (1984) use National Sample Survey (NSS) 28th and 32nd Rounds (1973/4 and 1977/8) for Karnataka for analyzing the distribution of levels of living for SCs/STs and non-SCs/STs. Saggar and Pan (1994) use NSS 38th Round for four Eastern states (Assam, Bihar, Orissa, and West Bengal) for inequality and poverty estimates separately for SCs, STs, and non-SCs/STs.

[33] An exception is Lanjouw and Zaidi (2003). They analyze disparities between SCs and non-SC for the state of Uttar Pradesh.

the SCs/STs households are likely to have less human and physical capital than non-SCs/STs, it is possible that SCs/STs earn lower returns to these assets than other majority households.

There are similar studies which analyze the causes of ethnic and caste disparities in living standards and wage earnings (van de Walle and Gunewardena 2001, Banerjee and Knight 1985). They attempt to identify ethnic and caste disparities through an application of the Blinder-Oaxaca decomposition. This decomposition is claimed to have drawbacks since it can provide different results depending on the assumptions about employers' discriminatory tastes (Neumark 1988). Therefore we use both Blinder-Oaxaca and Neumark methods to decompose the disparities in mean living standards between SCs/STs and non-SCs/STs into the component explained by differences in economic characteristics between the two groups and the component attributable to the differences in returns to the characteristics. About half of the differentials in log per capita expenditure between SCs/STs and majority households were attributable to differences in the returns. Even though Indian economy has been recognized to grow faster in recent decades, the result of decomposition shows that the source of disparities due to castes did not change much between 1983 and 1993.

In order to explain the large contribution of different returns to expenditure disparities, we analyze SCs and STs separately since the reasons for lower living standards of SCs and STs are historically different though they are both deprived people. We find that the disparities between SCs and the majority are largely explained by different accessibility to certain occupations while the differences of

geographic conditions largely contribute to disparities of living standards between STs and majority households.

The rest of the paper is followed by explaining the institutional details about caste and ethnicity in India. The data and the characteristics of the sample are described in Section 3. Section 4 specifies the determinants of living standards and highlights the differences of coefficients between SCs/STs and other majority households. Following the explanation of Blinder-Oxaca decomposition method, these differences are decomposed into two parts for examining the sources of differences in Section 5. In Section 6 and 7, the causes of disparities are separately identified for scheduled castes and scheduled tribes. The final section gives summaries and policy implications.

2. Caste and Ethnicity in India

In India, caste system has a long history since it is based on Hinduism which 82% of population believe in (GOI 1991). Caste can be defined as a small and named group of persons characterized by marriage within a group, hereditary membership and a specific style of life such as ritual status and a particular occupation (Beteille 1996). Originally caste system divided Hindu society into Brahmins (priests), Kshatriyas (warriors), Vaisyas (traders), and Sudras (menial jobs workers). Ati Sudras (the former untouchables) were even excluded from caste system and engaged in the most menial job. Traditionally some of the upper castes owned large land and power and the lower castes provided services for the dominant castes (Banerjee and Knight 1985).

The lower castes, therefore, tended to be highly found among the poor. That was especially the case for the former untouchables who did not have access to public wells or schools, could not participate in village festivals, and were not allowed to enter some shops owned by higher castes. After Independence, the socioeconomic conditions of lower castes seem to have shown some improvement due to abolition of untouchability and an increase in their political power (Deshpande 2001, Ramaswamy 1984). In addition, legislation entitling former untouchables, now called scheduled castes (SCs), to reserved places in government employment and educational institutions[34] is argued to have helped increasing the relative importance of the scheduled castes, especially in public employment (Kumar 1982, Shah 1985).

Even in the rural areas where 81% of SCs live, the improvement of communication, the spread of education, political mobilization of the people, and technological changes can have the effect of greatly weakening the link between castes and traditional occupations (Srinivas 2003). As many products are mass produced in factories and village economies are widely integrated, many specialized castes have almost entirely lost their traditional occupation (Banerjee and Knight 1985). Since most of SCs are likely to own small or no cultivated land, SCs in rural areas work largely as agricultural laborers. In the rural Indian setting where more than 70% of population engage in agriculture, some sorts of caste-related division of labor are considered to be still prevalent. Lanjouw and Stern (1991) and Jefferey (2002) report on rural villages in the state of Uttar Pradesh that the higher poverty rate among SCs is a reflection not only of poor endowments of productive assets, but

[34] Similar legislation for a wider group of economically or socially deprived castes (the so-called Other Backward Castes) was passed in 1991.

also of low educational standards and vulnerability to caste-based discrimination resulting in little access to any kind of regular employment outside the village. Thus we would hypothesize that the disparities of living standards between SC and majority households are largely attributable to different accessibility of lucrative jobs.

Distinct from Hindu caste society, more than 50 million Indians belong to tribal communities (Bhengra et al. 1999). The tribes, known as Aadivasi in India, have origins which precede the Aryans and the Dravidians and many have different lifestyles and languages from any of the known religions in India (Doshi 1990). Tribal populations are essentially found in the forested, hilly and mountainous areas (Joshi 1990). Before colonization by the British, the tribal communities were self-governed. Since the natural resource was abundant in many tribal areas, the British controlled these areas and the suppression of some tribes started (Bhengra et al. 1999).

By the Government of India Act, 1935, the areas where concentration rates of tribal population are high were classified as 'excluded' or 'partially excluded' areas and were placed under the provincial rule of the Governor, thereby no laws of the central legislature would apply. These provisions were incorporated into the Indian Constitution after independence and the tribes which are listed in the Constitution schedule are defined as "scheduled tribes (STs)" (Kumar 1982). While seats of parliament and educational institutes are reserved for STs as well as monetary assistance such as stipends and scholarships, literacy rate and attendance rate of school among STs are very low (Chakrabarty and Ghosh 2000). Such low attendance rate has been explained by physical inaccessibility (Raza et al. 1985), other work than

schooling (Trivedi 1993) and language and cultural differences (Heredia 1995). It is, however, also likely that the STs' expected returns to formal schooling can be very low since they live in villages where there are not so many well-paid jobs available, which deter their investment in education.

The situation of STs has become worse since the forests began shrinking due to construction of hydro-electric dams and the declaration of protected areas of wildlife (Xaxa 2001, Ramaiah and Manohar 1992). As the nation's development proceeds, it is more likely to find that STs are forced to move to another areas and to become laborers and construction workers for mining and quarrying (Bhengra et al. 1999). The majority of tribal people have been dispossessed of their ancestral land and turned into impoverished laborers.

STs tend to live in very remote hilly areas and many villages where only STs reside cannot be reached during rainy season while both STs and non-STs reside tend to be located close to the bus route and commercial areas (Joshi 1990). It is also documented that STs have lack of employment and less access to market and other infrastructure such as heath care facilities (Chakrabarty and Ghosh 2000), road connection and electricity (Rao 2003), communication facilities (Trivedi 1993), and irrigation facilities (Singh 1986). As a result, most of STs nowadays have to migrate seasonally to make ends meet because of the erratic agro-ecological condition and lack of other employment opportunities in their villages (Doshi 1990). These situations around STs are expected to lower the returns to productive assets and their living standards. We do not know, however, to what extent the disparities in living standards between STs and non-STs are attributable to these geographical differences

and whether there are significant disparities between STs and non-STs within a given location.

Our main analyses are implemented to households in 16 major states[35]. The reasons for excluding Northeastern states which are known as tribal states are following. First, the proportion of ST population in the Northeast is only 9% of total ST population in India even though the concentration of STs as a percentage of regional population is very high[36]. Second, because of its high concentration, STs in some states of the Northeast are not "minorities" in numbers and tend to have more political powers, which is not the case of STs in major states (Baruah 2003). Third, the price index for this region is not available for the Northeastern states except the state of Assam. Despite such differences between major states and the Northeastern states, it must be helpful for understanding the situation of STs in India to evaluate the disparities between STs and non-STs in Northeast and to compare them with STs in major states. Thus we analyze Northeastern region separately in a later section.

3. Data and Characteristics of Sample Households

The empirical analysis of this paper is based on the National Sample Survey 38th, 43rd, and 50th Rounds conducted in 1983, 1987 and 1993, respectively[37]. Each survey

[35] Sixteen major states are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. These major states and Delhi cover about 90% of the population in India.

[36] On average, the proportion of STs to total population in Northeast region is 26%. However, there are significant diversities in concentration rates. In Mizoram, Nagaland, and Meghalaya, the proportion of STs is higher than 85% while in Assam it is just 13% in 1991 (Bhengra et al. 1999). The majority (83%) of ST population in India are found in the so-called tribal belt running through the hilly terrain of Maharashtra, Gujarat, Rajasthan, Madhya Pradesh, Bihar, West Bengal, Orissa, and Andhra Pradesh (Chakrabarty and Ghosh 2000).

[37] It has been argued that there are serious concerns on incomparability of consumption data in NSS 55th Round conducted in 1999 with those in earlier rounds. This was because the recall periods of

covers about 120,000 households and over half a million individuals[38]. The sample of households is drawn based on a stratified random sampling procedure. The questionnaire includes household and individual socio-economic characteristics such as employment status and per capita expenditure as well as usual socio-economic variables. In the survey, social group of each household is denoted as "scheduled caste", "scheduled tribe", or "the other". The latter is a very large and heterogeneous category and contains castes that are very close to SCs in terms of social and economic backwardness. Hence, the disparities between SCs and other majority would actually understate the gap between the top and the bottom tiers of caste hierarchy[39].

We limit our sample to the rural sector in 16 major states. Adding Northeastern states to the sample by using the price index of a neighboring state, Assam, does not change the results. This gives us a sample of 42,677 majority households, 11,661 SC households (19%), and 5,918 ST households (10%) living in 6,110 villages for 1993 data[40]. These villages contain those where both SCs/STs and non-SCs/STs households reside and those where households belonging to only one of the groups are found. Most of SCs reside in villages with non-SC households (only 8% of SCs in the sample live in villages with only SCs) while 37% of STs live in the villages with only STs.

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some more frequently consumed goods changed from 30 days to 7 days, and those of less frequently consumed goods changed from 30 days to 365 days. See Tarozzi (2002), Deaton and Dreze (2002), Datt, Kozel and Ravallion (2003), and Deaton (2003) for discussions on the comparability of expenditure data with earlier rounds. Since this paper focuses not on wage but on living standards measured by per capita expenditure, we do not use NSS 55th Round data.

[38] The households living in rural areas account for about 65% of the sample.

[39] Political mobilization of SCs and the associated conflicts between SCs and Most Backward Casts in the state of Uttar Pradesh are discussed in Pai and Singh (1997).

[40] In 1991, SCs and STs account for 16.7 and 8.1% in the population, respectively (GOI 1991).

We use household monthly per capita expenditure as an indicator of welfare[41]. Consumption expenditure is considered to be a measures of well being in relatively longer time period than income since consumption tends to be smoothed against income fluctuation (Deaton 1997). Expenditure is often preferred for a measure of the current standard of living in agricultural economies to income data because of measurement errors in income earning data (van de Wall and Gunewardena 2001).

Monthly per capita expenditure is calculated by dividing total household expenditure spent in the previous month of the survey by total number of household members. Monthly total household expenditure covers almost all varieties of consumption spending such as food, fuel and light, clothing and footwear, durables, medical and education, rent, consumer taxes, and consumer services. The number of items asked in the questionnaire are 450. Consumed quantities of food and fuel items include both purchased and home-grown stock which are valued by the unit price. Rents for house and residential land are actual (not imputed) amount paid by household.

Figure 2-1 graphs cumulative distribution functions of per capita expenditure for three groups in 1993. Poverty incidence curves in Panel A compare the distribution of per capita expenditure of SCs with that of majority households. Panel B compares the distribution of per capita expenditure for SCs with that for STs. Examining stochastic dominance is useful for comparing the welfare of these groups since first-order stochastic dominance means that for any poverty line below some

[41] Per capita expenditures is deflated by state-specific poverty lines to adjust spatial cost-of-living differentials and the data for 1983 and 1987 are inflated up to 1993 price level.

maximum plausible poverty line[42], all poverty measures such as headcount ratio and poverty gap are lower for the curve lying below (Atkinson 1987). If the curves are crossed or cannot be ranked at first order, second order stochastic dominance is tested. Second-order stochastic dominance of the curve below means that for any poverty line below the maximum poverty line, the poverty gap index for the curve below is lower than that for the curve lying above.

As can be seen, the two curves in each panel do not cross, where SC curve lies above the majority curve and below ST curve. However it does not necessarily mean that the difference is statistically significant, especially for the comparison between ST and SC curves. In order to test the significance of the vertical differences between the two curves, the standard errors are calculated by following Davidson and Duclos (2000). If the vertical differences are significantly different from zero at every point below the threshold, the curve underneath dominates the curve above at first order. Table 2-1 provides these test results[43] where the differences in the ordinates between 4.5 and 6.0 log per capita expenditure are tested.

For the case of SC and majority curves, the null hypothesis that the distributions are the same over the range from 4.5 to 6.0 is rejected because all vertical differences are statistically different. It indicates that living standards of majority households dominate those of SCs at first order. In the first-order-dominance tests for SC and ST curves, however, the vertical difference is not

[42] We set the maximum poverty line at 6.0 log points (Rs.400), which is much higher than any of the official state rural poverty lines (the lowest 5.09 for Andha Pradesh to the highest 5.50 for Kerala). All India rural official poverty line for 1993 is Rs.206 (or 5.33 log points).

[43] The difference of poverty incidence curves are tested by using DAD: A software for distributive analysis version 4.2. The detail about this software is provided in MIMAP programme, International Development Research Centre, Government of Canada, and CIRPEE, Universite Laval. All test statistics are calculated using population weights.

statistically significant at 9 out of 16 points of testing. Thus we also test the second-order dominance. In the last two columns, the results for second-order-dominance tests are presented. At the conventional confidence level, the difference between SC and ST curves are not significant up to 5.1 (Rs.164), which means that SC curve does not dominate ST curve even at second order.

Table 2-2 gives descriptive statistics for each social group[44]. A mean per capita household expenditure for each social group shows that SCs/STs actually have lower standards of living on average than majority households in 1993. The highest educational attainment among household members who have completed schooling is also lower on average for SC/ST households. More than half of SC/ST households had no literate person (56% and 51%) while in 32% of majority households a member with highest educational attainment was illiterate. In 1993, 22 percent of majority households had a member who completed at least secondary education while only 8.4% of STs and 10.4% of SCs had a member who completed at least secondary education.

Average per capita land owned for SCs is, as expected, less than half of that for the majority and also much lower than that for ST households. Although the average per capita land owned for STs are higher than those for majority households, the proportion of irrigated area over cultivated land is one-third of that for majority households[45]. SCs own smaller amounts of other assets such as milch animals and draught animals than ST and majority households. The number of male adult

[44] The descriptive statistics for 1983 and 1997 are provided in Appendix Table 2-1.
[45] Singh (1986) notes that out of 199 districts with a percentage of more than eight per cent of STs population, only 19 districts lie in drought-free zone with assured irrigation, and because of the economic handicaps the facilities of assured irrigation have not been extended to the tribes to much extent.

household members are larger in the majority households by 0.12, and the age of the household head is lower in SC/ST households. The household composition of SCs/STs is similar to that of the majority.

4. Econometric Specification on Welfare

The average monthly per capita expenditure of SCs, STs and non-SCs/STs in 1993 were Rs.257, Rs.248, and Rs.324, respectively. This difference could be attributed to differences in several characteristics between these groups. Household welfare is assumed to be a function of household- and community-level endowments. We regress the log of per capita expenditure for the household i in social group s living in village j, y_{isj}, on household characteristics, X_{isj}, with allowing for village fixed effects, v_j,

(1) $y_{isj} = X_{isj}\beta_s + v_j + u_{isj}$,

where u_{isj} is an error term. Household characteristics include demographic variables, characteristics of household head, household human capital, land and asset variables shown in Table 2-2.

We run two sets of regressions: with and without village fixed effects based on village of current location. This village fixed effects specification is useful for testing the influence of location on the returns to household characteristics. Village fixed effects are expected to capture differences in between-village quality of land, local infrastructure development, geographical environment, and prices. Since we have only information indicating the current residence, not residence at birth or in childhood, it can be argued that the quality of schooling and educational attainments

is not well controlled by village fixed effects specification. In addition, if inter-regional migration is substantial, including village fixed effects may cause selection bias problem since the more skilled typically tend to move to the places with higher returns (Schultz 1988). We consider both possibilities when interpreting the results.

As mentioned earlier, 37% of ST households in the sample reside in villages where only STs live. A large part of the difference in living standards between STs and the majority can be attributable to such geographical differences. However, significant disparities between STs and the majority can still exist even within a village. In order to differentiate these ethnic and geographic differences, the analyses are also made by limiting the sample to mixed villages where both STs and the majority reside.

Table 2-3 and Table 2-4 present the regression results for SCs and the majority and those for STs and the majority, respectively[46]. Both tables include the specifications with and without village fixed effects. Chow tests reject the null hypothesis that all parameters for SC/ST regressions are same as those for majority regressions. The columns "Majority – SC" and "Majority – ST" show the differences in coefficients between the majority and SCs and those between the majority and STs. In the specifications both with and without village fixed effects, we can see the differences in coefficients of demographic variables for SCs/STs and for majority households are very small and most of them are not statistically significant. The returns to education and land between SCs/STs and the majority are, however, significantly different.

[46] The estimation results for 1983 and 1987 are in Appendix Table 2-2 and 2-3.

The coefficients of land owned in SC and ST regressions and (proportion of) irrigated land in majority regression increase after controlling for village fixed effects. These parameters in the specification without fixed effects might pick up the effects of omitted quality of land variations across villages which is negatively correlated with quantities of land (Bhalla 1988). If high quality is associated with lower quantities of land across locations, then return to land will be underestimated unless controlling for village fixed effects.

Even after controlling for these effects, SCs obtain significantly higher returns to owned land than majority households. This can be because SC households intensify their family labor on their own land, if any, to compensate for their lack of lucrative non-farm jobs[47]. Since it is observed that the adoption rate of high yield varieties and fertilizer usage for SCs are lower than those for majority households (Joshi 1990), it is less likely that SCs grow high-value crop mix such as vegetables and fruits on their land for earning higher returns to land. The returns to owned land for STs are also significantly higher than those for majority in the regression both with and without village fixed effects.

The results are more complicated in the case of irrigated land. Controlling for village fixed effects makes the return to irrigated land for STs much lower than that for majority households since the return for STs dropped from 0.20 to 0.02 and the return for majority households increased from 0.07 to 0.11. In the case of SCs, controlling for geographical differences makes the coefficient of irrigated land increase from 0.01 to 0.08 and statistically significant. The return for SCs, however,

[47] Cater (1984) argues that the inverse productivity relationship resulted from higher intensity of labor use on small farms. Or another possibility is that village fixed effects cannot capture the variations of land quality within villages since land quality is also likely to be plot-specific (Benjamin 1995)

is still lower than that for majority households. This would suggest a negative correlation between size and quality of irrigated land for majority and SC households and the positive correlation for STs. Since many areas where STs reside tend not to be suitable for irrigation, the small proportion of irrigated land may imply lower quality of irrigation facility.

The parameter estimates of maximum education attainments show higher returns to education for majority households than for SCs/STs[48]. For most of the education coefficients, the differences between SCs and majority are significant in the specifications both with and without village fixed effects. Comparing STs with the majority, we find none of the differences in education coefficients except secondary education are statistically significant in the specification without fixed effects. Once the geographic effects are controlled for, the coefficients of education dummies for all groups drops, especially for STs, which makes the differences in the education coefficients between STs and the majority significant.

There would be two explanations why the education coefficients for STs drop more significantly than other groups. The first possibility, as mentioned earlier, would be that village fixed effects are good proxies for local infrastructures which are correlated with quality and price of education, thereby education coefficients without controlling for fixed effects might be overestimated. Another possibility would be that if the returns to investment in education for STs can be earned through migration,

[48] If affirmative action favoring SCs/STs is more effective in public sector jobs, SCs/STs might tend to be hired more in public sector jobs. If public-sector wage is lower than private-sector wage, it can be argued that this lower returns for SCs/STs than for the majority came from public-private sector wage differences. Since we do not have the information whether the workers are in public or private sector jobs, we cannot test this possibility.

controlling for current residence would not allow such effects, which biases the estimates toward zero.

Table 2-5 gives the trends of migration by social groups in 1983 and 1999 [49]. As seen in Panel A, one-fifth of rural adults (age 15 and above) and one-third of urban adults formerly lived in different enumeration from current residence. These proportions are similar across social groups and over time. The reason for the moving, however, is different by social groups and educational attainments[50]. Panel B shows the proportion of adults who migrated for either "in search of employment", "in search of better employment", or "transfer of service/contract".

The proportion of migrants who moved due to employment tends to increase with the level of educational attainments. Between 1983 and 1999, this proportion for ST university graduates increased by 4.3 and 18.0 percentage points in rural and urban areas, respectively[51]. In contrast, these proportions for SC and majority university graduates declined over this period. It is likely, therefore, that the increasing trend of migration among skilled STs contributed to the decline of education coefficients in ST regression equation after controlling for village fixed effects.

Although we have examined the effect of education level on consumption, Foster and Rosenzweig (1996) find the interacted effects between schooling and technical change of agriculture in India. Their results suggest that the more educated are better able to take advantage of technological change. It is likely that

[49] The data for migration are available only for these 2 years.
[50] The major reason for changing the place of enumeration is marriage for all social groups
[51] Doshi (1990) mentions that new class of tribal white-color workers emerged due to government reservation policy.

technological change has a greater effect on profits in an educated population than in an uneducated one. Thus we also test whether there is such complimentary relationship between schooling and development of infrastructure since these interaction terms can be also important determinants of welfare. In order to capture some differences in productivity, we use two state-level variables: state development spending and farm output per net sown area[52] since these variables are found to have significant effects on poverty reduction in India (Ravallion and Datt 2002). In a new specification, the levels of these variables and their interaction terms with education and land variables are added to base specification[53]. The results are provided in Table 2-6.

Since these variables for one of the states, Himachal Pradesh, are not available in this data base, Table 2-6 also provides the regression coefficients for the case without these interaction terms when excluding Himachal Pradesh. State average agricultural yields (a proxy for agricultural productivity and development of agricultural infrastructure) is positively correlated with schooling investment except for STs, which partially supports the finding of Foster and Rosenzweig (1996). In the relationship between state development spending and household's investment in schooling, however, there seems no complementary association. One possibility for this negative relationship would be that less-developed states tend to spend more for

[52] These variables came from Ozler, Datt and Ravallion (1996) data base and we take 5-year averages (1989-1993) of them. Development expenditure includes expenditure on agriculture, rural development, special area programs, irrigation and flood control, energy, industry and minerals, transport and communications, science, technology and environment, education, medical, and public health, family welfare, water supply and sanitation, housing, urban development, labor and labor welfare, social security and welfare, nutrition, and relief for natural calamities.

[53] We also try two other specifications, one which adds the interaction terms with agricultural yield and the other with the interaction terms with development spending separately. The results are given in Appendix Table 2-4.

development purposes. Or this may be just because state-level measures are not good enough to capture the differences in productivities which may influence the returns to schooling. Further investigation must be made for understanding interacted relationship between schooling and agricultural development.

Since some of the interaction terms are not statistically significant, we also test whether a set of coefficients of interaction terms are jointly significant from zero or not (the bottom of Table 2-6). While all interaction terms are jointly significant in all social groups, interaction terms of agricultural productivity with land are not jointly significant in ST regression. In SC regression, interactions of agricultural productivity with schooling and those of development spending with land are not jointly significant. We find some complimentary relationships between agricultural development and schooling investment in rural India, though these relationships are not jointly significant for SCs.

This result suggests that returns to schooling in areas with higher agricultural productivity are likely to be higher, but only for majority households. The reason for more schooled farmers get higher returns is that they are likely to adopt high yield varieties and allocate complementary inputs efficiently. Such allocative efficiency due to schooling is expected to be found only among cultivators (Foster and Rosenzweig 1996). The reason why there is no significant relationship between schooling and agricultural development for SCs may be because the majority of SCs are not cultivators but agricultural laborers.

Table 2-7 provides the average marginal effects of schooling and land evaluated at mean value in the whole sample. In both specifications with and without

interaction terms, average marginal effects of schooling for majority households are much higher than those for SCs/STs, especially the returns for SCs are 6-60% lower. To the contrary, the average marginal effect of land owned for SCs is larger than that for the majority and STs by 49% and 11%, though the average marginal effect of irrigated land for SCs is much smaller than that for the other groups. The results so far suggest that there are both positive and negative influences on inequality arising from differences in returns. Thus we ask in next section how much in aggregate the differences in returns account for differences in living standards between SCs/STs and the majority.

5. Aggregate Difference and Decomposition Analysis

To analyze the source of aggregate differences in welfares across social groups, we apply Blinder-Oaxaca decomposition methods and an application recommended by Neumark (1988). Originally, these decompositions are applied to male-female wage differentials and racial differences (Oaxaca 1973, Corcoran and Duncan 1979). In rural India, however, self-employment in agricultural and informal sectors is the major source of income in more than half of the households. Limiting to the sample of wage employees makes it difficult to capture the whole picture in rural India. Thus we rather focus on per capita expenditure for measuring welfare disparities.

Let mean log of per capita expenditure of SCs/STs be y_s and that of non-SCs/STs be y_n. The reduced-form specification of y for the ith individual in social/ethnic group j is written as

(2) $y_{ij} = X_{ij}\beta_j + \varepsilon_{ij}$,

where X_{ij} is a vector of individual characteristics, β is parameter estimates, and ε_{ij} is error term with mean zero. Since regression lines pass through the means of the variables, the mean y of SCs/STs is determined by

(3) $\bar{y}_s = \bar{X}_s \beta_s$,

where $\bar{y}_s$ and $\bar{X}_s$ are the predicted mean log per capita expenditure and the mean characteristics of SCs/STs. Similarly the mean y of non-SCs/STs is written as $\bar{y}_n = \bar{X}_n \beta_n$. The mean per capita expenditure differentials between two groups are, therefore, decomposed as

(4) $\bar{y}_n - \bar{y}_s = (\bar{X}_n - \bar{X}_s)\beta_n + \bar{X}_s(\beta_n - \beta_s)$, or

(5) $\bar{y}_n - \bar{y}_s = (\bar{X}_n - \bar{X}_s)\beta_s + \bar{X}_n(\beta_n - \beta_s)$,

where the first term in the right hand side represents the disparities attributable to differences in characteristics of the group and the second term is attributable to the differences in returns to given characteristics. Equation (4) assumes that the returns for majority group prevail in labor market if there is no discrimination, while equation (5) assumes the returns for SCs/STs are found in absence of discrimination. Generally equations (4) and (5) yield different results and an empirical question arises which one should be used.

Neumark (1988) provides more general decomposition method without assuming that one of the groups has discriminatory structure. By using no-discrimination returns, β, expenditure differentials between social groups are decomposed by

(6) $\bar{y}_n - \bar{y}_s = (\bar{X}_n - \bar{X}_s)\beta + [\bar{X}_n(\beta_n - \beta) - \bar{X}_s(\beta_s - \beta)]$.

The first term in the right hand side is a part of differentials due to differences in characteristics while the second term is that due to differences in returns. As shown in Neumark (1988), the estimator of no-discrimination returns is derived as the coefficients estimated from the regression for the whole sample. Thus, in order to get $\hat{\beta}$, we estimate an OLS expenditure function by using the full sample in the same specifications shown in the previous section.

In the U.S. labor market literature, the second term in equation (6) is considered as a measure of "discrimination". As van de Walle and Gunewardena (2001) argue, the difference in mean characteristics (first term) could be the results of past unequal treatment and lower returns to minority groups could be because they live in less productive areas where they were forced to move in the past. This implies that the second term can be non-zero even though current discrimination does not exist, and thereby it might be misleading to interpret the second term as a result of current discrimination. Even so, understanding how much disparities are due to structure or different characteristics helps for explaining the causes of inequality and for selecting appropriate policies.

The results are shown in Table 2-8, which contains the results from Neumark and Blinder-Oaxaca decompositions for 1993 using both specifications with and without fixed effects. For Blinder-Oaxaca method, both SCs/STs and majority households are used as a reference group to avoid an arbitrary assumption about discriminatory structure. Thus, we have three decomposition results for each specification. Comparing these results shows that the structural contribution from Neumark decomposition tends to be lower than those from Blinder-Oaxaca

decomposition. It would not be the case that the "true" proportion due to structural differences must take between the values from two alternative reference groups. Thus, we focus on the results from Neumark decomposition hereafter.

As shown in Panel A, about half of the disparities in log per capita consumption between SCs and non-SCs are explained by differences in returns. Controlling for village fixed effects does not have a large impact on the decomposition between SC and majority households. The decomposition results of disparities between STs and the majority, however, change depending on whether controlling for village fixed effects or not (Panel B). The structural difference between STs and majority households accounts for 49% in the specification without controlling for fixed effects and 63% with controlling for fixed effects. It is likely that the larger structural component in the specification with fixed effects reflects the significant differences in returns to education when the effects of location selection and migration of educated STs are not captured.

In order to examine changes in the causes of disparities among social groups, we also use 1983 and 1987 data. Table 2-9 shows the results of Neumark decomposition for 1983, 1987, and 1993 with different specifications. From 1983 to 1993, structural component between SCs and the majority decreased only by 3 percentage points both in the specifications with and without village fixed effects. For the disparities between STs and the majority, the source of welfare disparities changed more drastically. In the specification without fixed effects, the structural component drops by 16 percentage points. If village fixed effects are controlled for, structural components change more gradually. This declining structural components

for STs and the majority seem to be consistent with the increasing trend of migration among skilled STs in the 1990s than in the 1980s. Higher mobility of the educated STs might have helped decreasing differences of schooling returns over time. In contrast, differences in returns between SC and majority households did not change much in 10 years.

In either case, structural differences account for by about half of the consumption disparities between SC/ST and majority households. In the next two sections, thus, we investigate the causes of large structural differences separately for SCs and STs.

6. Geographic Effects and Within Village Disparity between STs and non-STs

In order to understand why the returns are so different between STs and the majority, analyzing geographic differences would be helpful since 37% of ST households in the sample live in villages where only STs reside[54]. One can argue that the returns for STs are lower than those for the majority because STs live in unproductive remote areas. This argument implies that the structural differences are mainly attributed to geographical differences between productive areas where non-STs live and less productive areas where STs live. In order to verify whether such differences in returns also exist in villages where both STs and the majority reside or not, we limit the sample to villages with both STs and the majority, and compare the source of disparities with that from the full sample[55].

[54] The corresponding number for SCs is only 8% for the major-state sample in 1993.
[55] The regression results for the mixed villages sample are shown in Appendix Table 2-5, 2-6, and 2-7.

As shown in Table 2-10, the structural component in 1983 accounts for by about same proportion as that in the full sample. In 1987 and 1993, however, structural components in mixed villages are less important than those in the full sample by about 7 percentage points. This finding may suggest that the returns in villages where only STs reside are much lower than the returns in villages where only majority reside or both the majority and STs live. This would be partially because the villages with only STs tend to have poorer infrastructure and less employment opportunities other than low return agricultural production as described in Joshi (1990), thereby the returns are lower.

In the mixed-village sample, differences in returns are less important for disparities in living standards between STs and the majority than in the whole sample. It is important, however, to notice that even if we limit the sample to villages where both STs and the majority reside, 41-53% of disparities between ST and majority households are still attributable to structural differences. In order to compare the structural differences of STs and the majority who live in the same village, we predict per capita expenditures for STs and the majority living in the same village.

These are predicted by using coefficients and predicted village fixed effects from welfare regressions estimated separately for STs and the majority[56] where all household characteristics except ethnic group (STs or the majority) are evaluated at overall means. Thus we have two predicted log per capita expenditures for each mixed village, one for STs and the other for the majority. Figure 2-2 plots such predicted log per capita expenditures of the majority against that for STs for each

[56] The result for this regression is provided in Appendix Table 2-7.

village. Even if household characteristics were identical, STs tend to have lower living standards than majority households in the same geographical location.

Differences in the levels of living between STs and majority households are partly due to the fact that STs live in less productive areas with poor infrastructure[57] and lower accessibility to the market economy. This is often pointed out for justifying geographical targeting. According to the results, however, such disparities between STs and the majority are not just a matter of geography. Even after controlling for differences in household characteristics, we find that there are differences in expenditures between ST and majority households within given geographical areas. The possible reasons would be different schooling quality and different access and mobility within villages between STs and the majority.

So far, we analyze the disparities between STs and majority households in 16 major states and excluded Northeastern states. As explained in Section 2, STs in these states are rather "majority". Under this circumstance, our question is whether STs in Northeastern region put up with lower living standards than non-STs and whether returns to household's characteristics in the region are lower than those in major states.

As we can see in Table 2-11, there are no significant differences in mean per capita expenditure between ST and non-ST households in Northeastern states. Average per capita expenditure for STs is even higher than that for non-STs. Differences in the highest level of adult education between STs and non-STs are also smaller than those in major states. While average per capita land owned in

[57] In Jharkhand, one of the areas where the concentration of STs is high, more than 60 per cent of the villages are lack of road connectivity and 85 per cent of villages have no electricity (Rao 2003).

Northeastern states is smaller than that in major states, STs own larger land compared to non-STs in Northeastern states on average. These differences between major states and Northeastern region are more apparent when we see the living standards separately in three types of villages: only non-STs reside, only STs reside, and both STs and non-STs reside. In major states, villages with only STs have the lowest averages of per capita expenditure and the levels of education. To the contrary, in Northeastern region, villages with only STs have the highest average of per capita expenditure.

These preferable status of STs in Northeastern region does not necessarily mean that they enjoy higher returns to their physical and human capital than non-STs. Table 2-12 shows the results of regression analysis for Northeastern states. In the specification without village fixed effects, returns to education for STs and non-STs are not significantly different (except below primary level). After controlling for geographical differences, it turns out that STs earn lower returns to education than non-STs significantly. The returns to land for STs are higher than those for non-STs in the specifications both with and without fixed effects. However, the differences turn to be insignificant after controlling for village fixed effects. This may suggest that land quality across villages is very different and it is relatively uniform within villages in Northeastern states.

Comparison with the results for major states (Table 2-4) reveals that the coefficients of education in Northeastern states (both non-STs and STs) are lower than those in major states by at least 10 per cent while both STs and non-STs earn higher returns to land than in major states. Such lower returns in the Northeast both

for STs and the majority may suggest less mobility from the Northeast to the major states. If the less skilled (both STs and non-STs) tend to live in the Northeast, the returns in the Northeast are likely to be biased towards zero in both majority and ST regressions.

7. Effects of Occupation on Differentials between SCs and Majority

Since each caste had a traditional occupation regarded as its sacred duty, there has been an occupational division in Hindu society. It can be argued that the disparities of living standards between SC and majority households are attributable to different accessibility of certain jobs rather than geographical effects since SCs and non-SCs households normally reside in the same village. It is crucial for understanding the structural differences, therefore, to examine to what extent such occupational segregation plays a role for the disparities of living standards between SC and majority households in rural India.

Table 2-13 presents occupational distribution for SC and majority households in 1983, 1987 and 1993. These classifications depend on India's National Classification of Occupation (NCO1968) code. In rural India, most population are employed in agricultural sector, accounting for 76% in 1983 and 73% in 1993. The major difference between SC and majority households is that more than half of SC household are agricultural laborers while only 20% of majority households are agricultural laborers. Majority households are more likely to have professional and managerial jobs than SCs. The proportion of other nonfarm employment such as less-paid construction workers for SCs is higher than that for majority households. Thus

we would expect that there still remains different accessibility to occupation depending on caste and social groups.

Table 2-13 also shows that there is a significant difference in mean per capita expenditure for professional/managerial workers and agricultural laborers. Even the per capita expenditure for cultivators is much higher than that for agricultural laborer. If occupational status is one of the important individual characteristics for determining the level of expenditure, omitting them may understate the importance of differences in characteristics and overstate that of differences in returns.

In the analysis of wage equation, however, using occupational dummies as explanatory variables can be argued to be problematic (Schultz 1988). This is because education variables do not capture an individual's human capital perfectly, which may leave unobserved ability in error terms. Since the more skilled tend to have better occupations, occupational dummies may be correlated with the error terms. Thus, we need to interpret the results with caution.

The regression results in Table 2-14 shows that most of the occupation coefficients are statistically significant with negative signs for agricultural laborers and with positive and larger magnitudes for professional/managerial jobs. The coefficients of education and land decline after including occupational dummies. Similar to the results without occupation dummies, the coefficients of education and land for SCs are significantly different from those for the majority. As Table 2-15 shows, including occupation dummies has a significant effect on decomposition results[58].

[58] The results for 1983 and 1987 are in Appendix Table 2-8 and 2-9.

The structural component in 1993 declines from 46% (without occupation dummies in Table 2-8) to 31% in the specification without village fixed effects and from 48% to 34% in the specification with fixed effects. Once we control for the occupation in expenditure functions, the contribution of structural component drops significantly. While this may be due to increase in significant explanatory variables, the coefficients can be underestimated by occupation dummies, which can also decrease the contribution of structural component.

Banerjee and Knight (1985) shows that the differences in accessibility to occupation between SCs and majority households accounted for the large part of their wage disparities in the capital city, Delhi. In order to examine this effect, we incorporate household head's occupational choice into decomposition analysis, following Banerjee and Knight (1985). Different probabilities of access to certain jobs, or job discrimination, may cause persons of different social groups who otherwise have the same characteristics to work in different occupations. If we incorporate a separate model of occupational attainment into the analysis of differentials in living standards, the difference in mean per capita expenditure can be decomposed by using the proportion of each group (*s* refers to SCs and *n* to non-SCs) in occupation *i* (p_{is} and p_{in}) as follows:

(7) $\bar{y}_n - \bar{y}_s$

$= \sum_i (p_{in}\bar{y}_{in} - p_{is}\bar{y}_{is})$

$= \sum_i (p_{in}\bar{X}_{in}\beta_{in} + p_{is}\bar{X}_{is}\beta_{is})$

$= \sum_i p_{is}(\bar{X}_{in}\beta_{in} - \bar{X}_{is}\beta_{is}) + \sum_i (p_{in} - p_{is})(\bar{X}_{in}\beta_{in})$

$$= \sum_i p_{is}\beta_i(\overline{X}_{in} - \overline{X}_{is}) + \sum_i p_{is}[\overline{X}_{in}(\beta_{in} - \beta_i) - \overline{X}_{is}(\beta_{is} - \beta_i)] + \sum_i (p_{in} - \hat{p}_{is})(\overline{X}_{in}\beta_{in})$$
$$+ \sum_i (\hat{p}_{is} - p_{is})\overline{X}_{in}\beta_{in},$$

where $\hat{p}_{is}$ is the proportion of SCs in the sample who would be in occupation *i* if SCs faced the same occupational structure as non-SCs. The first term is a part explained by the differences in individual characteristics with the returns and job proportions held fixed. The second term represents the effect of caste differences in the returns to household characteristics within each occupation. The third term is the part explained reflecting differences in occupational attainments which are due to differences in individual and household characteristics. The last term is the effect of caste differences in occupational attainment which cannot be explained by differences in individual characteristics.

We estimate a separate model of occupational attainment for non-SCs by multinomial logit estimation with 7 occupational categories. Table 2-16 provides the regression results[59]. Household head's education tends to increase probability of working as non-agricultural laborer. Per capita land owned also has positive effects on escaping from being an agricultural laborer, though the size of owned land does not make any difference in working as non-agricultural laborer and agricultural laborer. Muslim households are more likely to be engaged in professional, service and other non-farm jobs than casual agricultural work.

Employing these estimates, we obtain the predicted distributions for SCs ($\hat{p}_{is}$) and non-SCs ($\hat{p}_{in}$) by calculating the mean of the predicted probabilities for each occupation after summing over observations. For non-SCs, this estimation procedure

[59] The results for 1983 and 1987 are given in Appendix 2-10 and 2-11.

yields a predicted distribution which is identical to their actual sample distribution ($\hat{p}_{in} = p_{in}$). Difference in the predicted distributions, $p_{in} - \hat{p}_{is}$, is explained component due to difference in characteristics, and residual difference, $\hat{p}_{is} - p_{is}$, is unexplained component due to different access or discrimination.

For each occupational group, we decompose the actual log per capita expenditure differentials between SCs and non-SCs households (column G in Table 2-17) into components due to characteristics (column E) and returns (column D) by using the same specification as Table 2-3. The results from further decomposition analysis are shown in the rest of the columns. In 1983, the explained expenditure difference (column I) accounts for 19%, the explained occupational difference (column III) for 21%, the component of different returns (column II) for 30%, and occupational structural component (column IV) for 29%. For 1987 and 1993, the structural components (sum of column II and IV) declined from 59% to 54%, with equal importance of occupational structural differences (job discrimination) and the differences in returns to household characteristics (column II).

In order to examine robustness of the results from decomposition analyses, we apply different assumptions regarding occupational choice. When we treat occupation as exogenous characteristics, the structural component accounts for 30%. If accessibility to certain occupation is assumed to be determined by individual's characteristics, then the structural component explains 54% of disparities in expenditure between SCs and majority households. In the base estimate where occupational difference is assumed to be captured through education variable, the structural differences contribute to 46% of the expenditure disparities.

While the proportion of the structural components varies by the assumptions on occupation, the sources in expenditure disparities between SCs and the majority seem to have changed only marginally for over 10 years. This result would pose a question for an optimistic view that prospects a breakdown of caste-based division of labor in rural India. We are not sure, however, whether this structural differences are due to "discrimination" against SCs. Historical patterns of employment may influence SC's choice of occupation through low expectations and aspirations, which makes them to accept lower status jobs (Hoff and Pandey 2003). The fact that male blue-collar occupations are likely to be found through caste-based contacts and networks (Munshi and Rosenzweig 2003) may also explain such differences between SCs and non-SCs.

8. Conclusion

We found that SCs and STs continued to be deprived long after the government of India had introduced its policy of affirmative action. The disparities of living standards between SC/ST and majority households in rural India are not only because SCs and STs own lower human and physical capital than majority households, but also because these groups face significantly different structures of income generation measured by different returns in human capital earning equations. By decomposing the differences in per capita expenditure by social or ethnic groups, we find that these differences in characteristics and structure equally contributed to the aggregate disparities of living standards. Comparison among three different time periods (1983, 1987, and 1993) reveals that the component of structural difference declined over

time but it still accounts for more than half of the disparities between SC/ST and majority households.

Given different historical backgrounds, we seek the causes of persistent inequalities for STs and SCs separately. We find that the differences in living standards between STs and the majority are largely due to geographical differences between villages where only poorer STs live and villages where only the majority or both the majority and STs reside. Therefore, geographical targeting to the areas with high concentration of STs would be one of the effective ways for reducing poverty in India. The results in this paper suggests, however, that targeting to these areas are not enough to reduce inequality between STs and the majority since STs earn lower returns than majority households even within villages where both STs and non-STs reside. Policy makers and aid organizations should seek to find what causes lower returns for STs as well as put an effort on how to effectively reach the most vulnerable people within the poor areas.

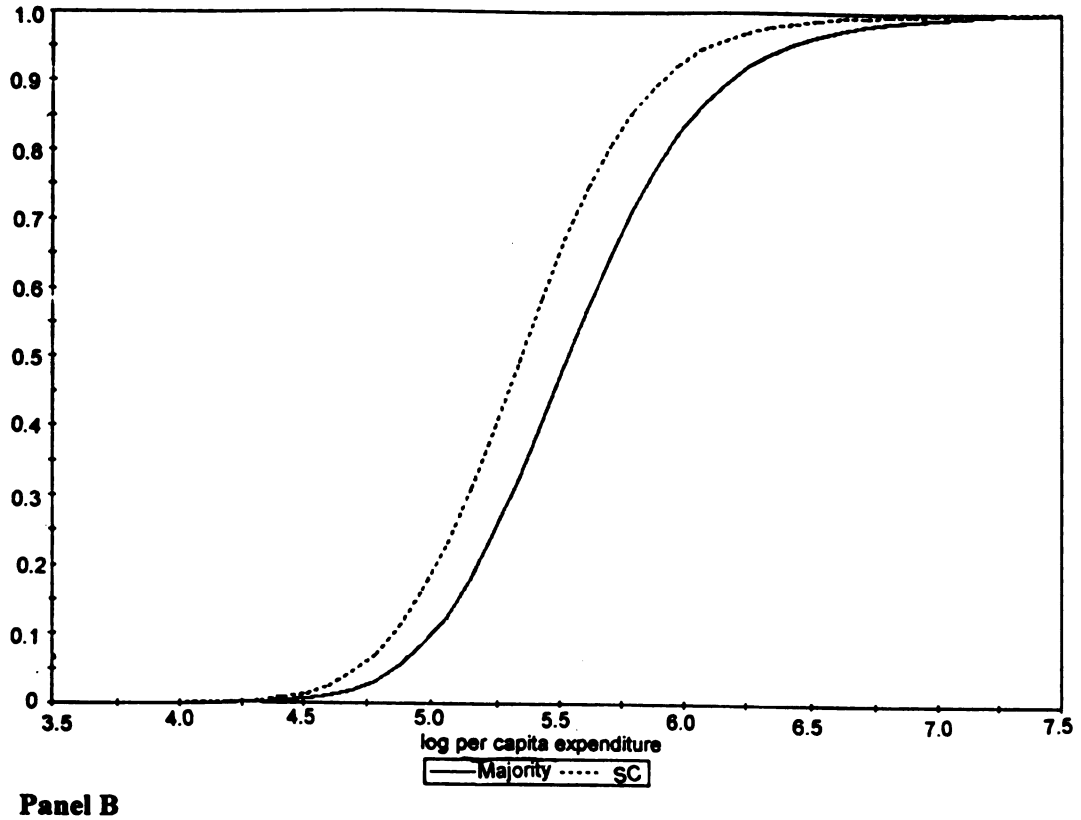
It is argued that job discrimination is more serious than wage discrimination in some developing counties (Lipton and Ravallion 1995). India is one of the well-known countries in this regard since each caste in India was originally linked to a specific occupation. Even though the decomposition analysis cannot identify whether the different coefficients contributing to the welfare disparities between SCs and the majority are totally due to "discrimination", our results show that SC households still have disadvantages to get well-paid jobs, which leads to lower per capita expenditure. Making labor market active as well as raising human and physical capital among SCs

are crucial for reducing disparities of living standards between SC and other majority households in rural India.

It is considered that caste "discrimination" is less likely to be found in the city than in the village since caste differs from sex and race in that it is less readily identified and, therefore, the caste system became less rigid owing to the greater anonymity and the diminishing correlation between occupational or economic stratification (Banerjee and Knight 1985). Munshi and Rosenzweig (2003) actually find in Bombay's labor market that lower caste girls, who historically had low labor market participation rates, switch rapidly to English schools in order to take advantage of new opportunities available in the 1990s. It is interesting to test to what extent caste "discrimination" plays a role to explain the disparities of living standards between SCs and the majority in urban areas and how it has been changing after recent economic development in India for male and female separately. This would remain for the future research.

Figure 2-1 Cumulative Distribution of Log Per Capita Expenditure by Social Group in 1993

Panel A



Panel B

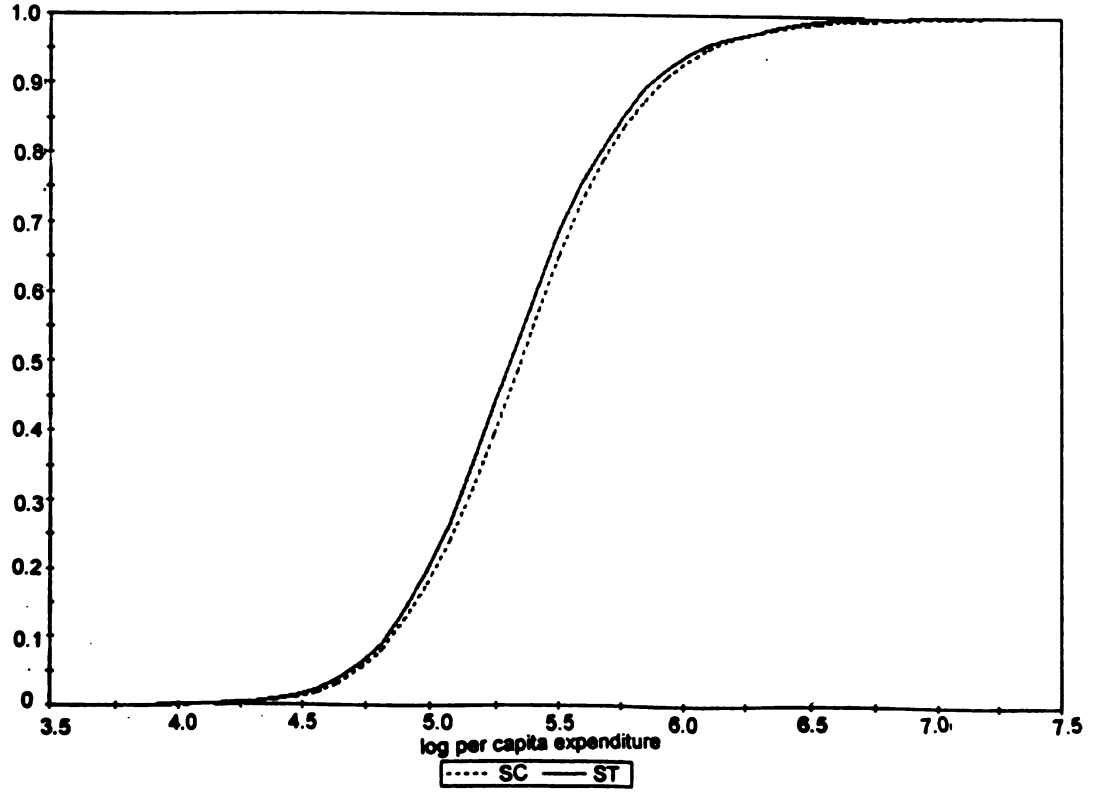


Figure 2-2 Predicted Log Per Capita Expenditure by Social Group and Location at Mean 1993

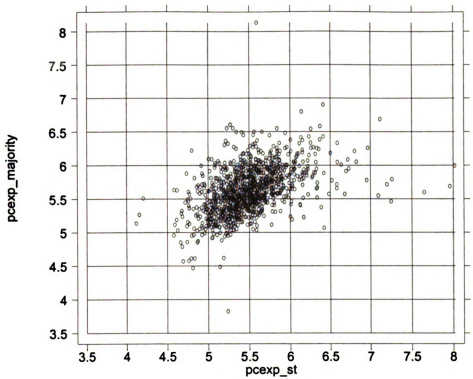


Table 2-1 Test Results for Stochastic Dominance of Log Per Capita Expenditure

	The difference between curves					
	Majority - SC		SC - ST		SC - ST	
Points of testing	First Order Dominance	Standard Error	First Order Dominance	Standard Error	Second Order Dominance	Standard Error
4.5	-0.0073	(0.0017)	-0.0039	(0.0027)	-0.0011	(0.0011)
4.6	-0.0142	(0.0024)	-0.0030	(0.0038)	-0.0015	(0.0013)
4.7	-0.0287	(0.0034)	-0.0050	(0.0056)	-0.0021	(0.0016)
4.8	-0.0408	(0.0042)	-0.0071	(0.0074)	-0.0029	(0.0021)
4.9	-0.0625	(0.0052)	-0.0154	(0.0093)	-0.0040	(0.0028)
5.0	-0.0904	(0.0062)	-0.0142	(0.0106)	-0.0058	(0.0036)
5.1	-0.1157	(0.0070)	-0.0280	(0.0122)	-0.0080	(0.0045)
5.2	-0.1375	(0.0077)	-0.0389	(0.0135)	-0.0114	(0.0055)
5.3	-0.1594	(0.0082)	-0.0403	(0.0141)	-0.0156	(0.0066)
5.4	-0.1765	(0.0083)	-0.0414	(0.0140)	-0.0196	(0.0077)
5.5	-0.1820	(0.0081)	-0.0351	(0.0134)	-0.0232	(0.0087)
5.6	-0.1784	(0.0076)	-0.0230	(0.0128)	-0.0259	(0.0097)
5.7	-0.1618	(0.0072)	-0.0157	(0.0117)	-0.0277	(0.0106)
5.8	-0.1380	(0.0065)	-0.0149	(0.0105)	-0.0293	(0.0113)
5.9	-0.1143	(0.0059)	-0.0127	(0.0095)	-0.0308	(0.0119)
6.0	-0.0929	(0.0051)	-0.0097	(0.0073)	-0.0320	(0.0125)

Number of	observations
Majority	42,699
SCs	11,666
STs	5,918

Note: Formula for standard error is provided by Davidson and Duclos (2000). Computation was performed by using "DAD: A Software for Distributive Analysis/Analyse Distributive". Estimates are calculated by accounting stratified sampling design and using population weights.

Table 2-2 Descriptive Statistics, 1993 (Full Sample: Major States)

	Social Groups		
	Majority	SC	ST
log (per capita expenditure) 1993 price level (Rs.)	5.631	5.428	5.395
	(0.518)	(0.461)	(0.464)
Number of household male adult members	1.608	1.468	1.478
	(1.042)	(0.905)	(0.866)
Number of household male adult members	1.570	1.407	1.466
	(0.893)	(0.750)	(0.796)
Female headed household (dummy variable)	0.102	0.095	0.075
Proportion of household members:	(0.302)	(0.293)	(0.264)
Males age 15-59	0.436	0.445	0.458
	(0.212)	(0.209)	(0.192)
Females age 15-59	0.450	0.452	0.461
	(0.202)	(0.201)	(0.183)
Males older than and equal to 60	0.055	0.051	0.039
	(0.137)	(0.140)	(0.118)
Females older than and equal to 60	0.059	0.052	0.043
	(0.157)	(0.149)	(0.131)
Age of household head	44.53	42.59	41.25
	(13.80)	(13.54)	(13.12)
Maximum educational attainment in household:			
Not literate	0.316	0.556	0.509
	(0.465)	(0.497)	(0.500)
Literate but not completed primary	0.138	0.154	0.143
	(0.345)	(0.361)	(0.350)
Primary completed but not completed middle	0.153	0.131	0.118
	(0.360)	(0.337)	(0.322)
Middle completed but not completed secondary	0.173	0.114	0.094
	(0.379)	(0.318)	(0.292)
Secondary completed but not completed univ	0.165	0.081	0.059
	(0.371)	(0.273)	(0.236)
University completed and above	0.055	0.023	0.025
	(0.229)	(0.148)	(0.156)
Per capita land owned (hectare)	0.243	0.098	0.251
	(0.553)	(0.254)	(0.484)
Proportion of land irrigated over cultivated land	0.338	0.230	0.128
	(0.440)	(0.404)	(0.299)
Possession of mulch animal (dummy variable)	0.502	0.393	0.420
	(0.500)	(0.488)	(0.494)
Possession of draught animal (dummy variable)	0.305	0.200	0.461
	(0.460)	(0.401)	(0.499)
Number of observations	42677	11661	5918

Note: The number in the parentheses are standard deviations.

Table 2-3 Determinants of Living Standards, 1993 (Full Sample, SC)

	Without FE			With FE		
	Majority	SC	Majority - SC	Majority	SC	Majority - SC
Female headed household	0.131	0.121	0.010	0.108	0.109	-0.001
	(12.80)	(6.50)	(0.44)	(11.68)	(5.81)	(-0.05)
Number of adult males	-0.080	-0.058	-0.022	-0.071	-0.060	-0.011
	(-19.23)	(-6.70)	(-2.15)	(-19.08)	(-7.02)	(-1.25)
Number of adult females	-0.024	-0.035	0.011	-0.025	-0.022	-0.003
	(-5.33)	(-3.71)	(1.04)	(-6.33)	(-2.36)	(-0.32)
Proportion of male15-59	-0.024	-0.018	0.005	-0.011	0.016	-0.027
(over adults)	(-0.55)	(-0.45)	(0.11)	(-0.56)	(0.40)	(-0.64)
Proportion of female15-59	-0.408	-0.337	-0.071	-0.389	-0.324	-0.065
	(-12.54)	(-5.77)	(-1.02)	(-13.46)	(-5.61)	(-1.07)
Proportion of female>=60	-0.365	-0.270	-0.096	-0.387	-0.287	-0.100
	(-10.59)	(-4.30)	(-1.28)	(-12.64)	(-4.65)	(-1.54)
Age of head	0.004	0.003	0.001	0.004	-0.001	0.005
	(4.32)	(1.57)	(0.67)	(4.12)	(-0.45)	(2.50)
Age of head squared/100	-0.002	-0.002	-0.001	-0.002	0.002	-0.004
Maximum education	(-2.22)	(-0.86)	(-0.25)	(-2.42)	(1.02)	(-2.00)
Literate, not completed primary	0.104	0.096	0.008	0.058	0.009	0.049
	(13.26)	(7.74)	(0.55)	(7.95)	(0.73)	(3.50)
Primary completed	0.175	0.141	0.034	0.095	0.048	0.047
	(22.99)	(10.95)	(2.15)	(13.38)	(3.62)	(3.36)
Middle completed	0.256	0.180	0.077	0.167	0.079	0.088
	(35.27)	(13.08)	(4.72)	(23.87)	(5.48)	(6.29)
Secondary completed	0.425	0.310	0.115	0.321	0.208	0.113
	(58.50)	(20.42)	(6.54)	(45.34)	(13.19)	(7.06)
University completed and above	0.588	0.411	0.176	0.483	0.276	0.207
	(59.41)	(15.03)	(5.77)	(51.33)	(10.01)	(7.67)
Per capita land owned (ha)	0.200	0.358	-0.158	0.205	0.402	-0.197
	(49.70)	(15.78)	(-6.49)	(51.99)	(15.45)	(-8.95)
Per capita land owned squared	-0.005	-0.041	0.036	-0.005	-0.047	0.042
	(-28.08)	(-7.31)	(6.07)	(-31.25)	(-7.87)	(8.40)
Proportion of irrigated land	0.069	0.012	0.057	0.109	0.075	0.034
	(12.47)	(1.12)	(4.47)	(15.79)	(5.15)	(2.83)
Possess milch animals	0.054	0.064	-0.010	0.067	0.079	-0.012
	(10.09)	(7.04)	(-0.92)	(12.54)	(7.76)	(-1.21)
Possess draught animal	-0.064	-0.051	-0.013	0.005	-0.008	0.013
	(-11.80)	(-4.65)	(-0.99)	(0.89)	(-0.63)	(1.08)
Constant	5.600	5.507	0.092	5.625	5.573	0.052
	(177.43)	(103.73)	(1.44)	(199.28)	(106.43)	(0.93)
Number of observations	42677	11661	54338	42677	11661	54338
Number of villages	5796	3782	5939	5796	3782	5939
R squared	0.203	0.099	0.213	0.192	0.084	0.202
F-statistics	604.49	72.39	399.16	592.36	54.05	425.13
Chow Test statistics			39.15			40.68

Note: The numbers in parentheses are t-statistics.

Table 2-4 Determinants of Living Standards, 1993 (Full Sample, ST)

	Without FE			With FE		
	Majority	ST	Majority - ST	Majority	ST	Majority - ST
Female headed household	0.131	0.126	0.005	0.108	0.113	-0.005
	(12.80)	(4.56)	(0.16)	(11.68)	(4.65)	(-0.17)
Number of adult males	-0.080	-0.086	0.006	-0.071	-0.072	0.001
	(-19.23)	(-7.26)	(0.43)	(-19.08)	(-6.88)	(0.08)
Number of adult females	-0.024	-0.013	-0.010	-0.025	-0.003	-0.022
	(-5.33)	(-1.06)	(-0.71)	(-6.33)	(-0.30)	(-1.69)
Proportion of male15-59	-0.024	0.018	-0.031	-0.011	0.043	-0.054
(over adults)	(-0.55)	(0.31)	(-0.44)	(-0.56)	(0.82)	(-0.87)
Proportion of female15-59	-0.408	-0.461	0.053	-0.389	-0.364	-0.025
	(-12.54)	(-5.40)	(0.53)	(-13.46)	(-4.87)	(-0.28)
Proportion of female>=60	-0.365	-0.440	0.075	-0.387	-0.330	-0.057
	(-10.59)	(-4.68)	(0.68)	(-12.64)	(-3.99)	(-0.59)
Age of head	0.004	-0.001	0.006	0.004	-0.001	0.005
	(4.32)	(-0.45)	(1.81)	(4.12)	(-0.65)	(1.67)
Age of head squared/100	-0.002	0.004	-0.006	-0.002	0.004	-0.006
Maximum education	(-2.22)	(1.36)	(-1.85)	(-2.42)	(1.56)	(-2.00)
Literate, not completed primary	0.104	0.095	0.009	0.058	0.033	0.025
	(13.26)	(5.96)	(0.47)	(7.95)	(2.23)	(1.39)
Primary completed	0.175	0.155	0.019	0.095	0.051	0.044
	(22.99)	(8.84)	(0.92)	(13.38)	(3.10)	(2.32)
Middle completed	0.256	0.227	0.030	0.167	0.113	0.054
	(35.27)	(11.80)	(1.31)	(23.87)	(6.23)	(2.57)
Secondary completed	0.425	0.381	0.044	0.321	0.199	0.122
	(58.50)	(17.07)	(1.69)	(45.34)	(9.53)	(5.08)
University completed and above	0.588	0.602	-0.014	0.483	0.364	0.119
	(59.41)	(15.99)	(-0.33)	(51.33)	(9.91)	(3.13)
Per capita land owned (ha)	0.200	0.239	-0.039	0.205	0.286	-0.081
	(49.70)	(14.94)	(-2.12)	(51.99)	(18.88)	(-4.50)
Per capita land owned squared	-0.005	-0.018	0.013	-0.005	-0.022	0.017
	(-28.08)	(-7.63)	(4.96)	(-31.25)	(-10.85)	(8.50)
Proportion of irrigated land	0.069	0.196	-0.127	0.109	0.021	0.088
	(12.47)	(10.66)	(-5.97)	(15.79)	(0.84)	(3.83)
Possess milch animals	0.054	0.038	0.015	0.067	0.034	0.033
	(10.09)	(3.19)	(1.06)	(12.54)	(2.79)	(2.36)
Possess draught animal	-0.064	-0.099	0.035	0.005	0.001	0.004
	(-11.80)	(-8.07)	(2.40)	(0.89)	(0.10)	(0.27)
Constant	5.600	5.574	0.026	5.625	5.508	0.117
	(177.43)	(74.42)	(0.29)	(199.28)	(83.87)	(1.48)
Number of observations	42677	5918	48595	42677	5918	48595
Number of villages	5796	1462	6041	5796	1462	6041
R squared	0.203	0.182	0.226	0.192	0.139	0.212
F-statistics	604.49	74.20	385.22	592.36	49.97	349.01
Chow test statistics			33.45			11.84

Note: The numbers in parentheses are t-statistics.

Table 2-5 Proportion of Migrants by Social Groups

Panel A	*Proportion of adult population with different Enumeration (%)*			
	Rural		Urban	
	1983	1999	1983	1999
ST	19.3	20.4	34.7	34.5
SC	21.6	24.4	31.1	30.5
Majority	20.9	25.0	31.5	33.8
Total	20.9	24.4	31.6	33.4

Panel B	*Proportion of adult population migrated for employment (%)*			
	Rural		Urban	
	1983	1999	1983	1999
ST	2.91	1.86	14.48	12.43
Not literate	2.74	1.55	9.76	7.65
Below primary	2.47	1.51	26.04	13.11
Primary	2.28	1.66	21.61	13.45
Middle	4.32	1.70	11.58	10.11
Secondary	11.85	3.61	22.36	12.48
University	13.92	18.25	15.37	33.61
SC	2.19	1.79	12.51	9.89
Not literate	1.88	1.26	10.27	9.09
Below primary	2.96	2.83	16.55	11.36
Primary	2.47	2.05	12.74	9.77
Middle	2.79	2.04	12.49	8.47
Secondary	6.99	2.94	17.58	10.52
University	9.40	8.97	29.75	17.10
Majority	2.46	2.10	12.61	10.97
Not literate	1.74	1.31	8.53	7.78
Below primary	2.79	2.22	13.39	12.80
Primary	2.61	2.03	12.57	10.01
Middle	2.43	1.97	12.05	9.90
Secondary	6.80	3.66	15.26	11.38
University	13.45	8.56	21.00	15.49

Note: Figures in Panel A are percentage of adult population (age 15 and above) reporting that current enumeration is different from the last usual residence for each social group. Figures in Panel B are percentage of adult population reporting either "in search of employment", "in search of better employment", or "transfer of service/contract" as a reason of moving.

Table 2-6 Determinants of Living Standards with Interaction Terms (Except Himachal Pradesh)

	Without interaction terms			With interaction terms		
	Majority	SC	ST	Majority	SC	ST
Female headed household	0.123	0.126	0.128	0.118	0.123	0.125
	(11.54)	(6.53)	(4.59)	(11.36)	(6.49)	(4.60)
Number of adult males	-0.078	-0.058	-0.085	-0.076	-0.056	-0.087
	(-18.23)	(-6.46)	(-7.17)	(-11.28)	(-6.38)	(-7.52)
Number of adult females	-0.024	-0.033	-0.015	-0.020	-0.035	-0.012
	(-5.20)	(-3.41)	(-1.19)	(-4.58)	(-3.65)	(-0.95)
Proportion of male15-59	-0.012	-0.003	0.018	-0.012	0.005	0.012
(over adults)	(-0.51)	(-0.08)	(0.30)	(-0.51)	(0.13)	(0.21)
Proportion of female15-59	-0.394	-0.331	-0.465	-0.404	-0.331	-0.493
	(-11.76)	(-5.50)	(-5.37)	(-12.33)	(-5.62)	(-5.84)
Proportion of female>=60	-0.357	-0.271	-0.443	-0.386	-0.273	-0.465
	(-10.05)	(-4.20)	(-4.65)	(-11.09)	(-4.33)	(-5.00)
Age of head	0.004	0.003	-0.001	0.002	0.001	-0.003
	(3.81)	(1.31)	(-0.55)	(1.89)	(0.66)	(-1.20)
Age of head squared/100	-0.002	-0.001	0.005	-0.001	-0.001	0.006
	(-1.74)	(-0.63)	(1.51)	(-0.19)	(-0.17)	(2.04)
Maximum education						
Literate	0.104	0.095	0.094	0.107	0.179	0.444
	(12.98)	(7.47)	(5.87)	(2.76)	(3.21)	(4.98)
Primary completed	0.174	0.141	0.155	0.124	0.183	0.568
	(22.50)	(10.59)	(8.78)	(3.37)	(3.28)	(5.81)
Middle completed	0.256	0.176	0.223	0.181	0.164	0.513
	(34.74)	(12.59)	(11.59)	(5.20)	(2.75)	(4.73)
Secondary completed	0.423	0.307	0.378	0.261	0.194	0.883
	(57.06)	(19.60)	(16.88)	(8.05)	(3.14)	(7.58)
University and above	0.582	0.401	0.601	0.207	0.190	0.850
	(57.97)	(14.49)	(15.85)	(4.55)	(1.52)	(4.24)
Per capita land owned (ha)	0.199	0.356	0.235	0.225	0.125	0.124
	(48.87)	(15.42)	(14.70)	(19.29)	(1.56)	(1.94)
Per capita land squared	-0.005	-0.041	-0.018	-0.006	-0.067	-0.021
	(-27.68)	(-7.13)	(-7.50)	(-30.14)	(-7.93)	(-8.76)
Proportion of irrigated land	0.070	0.012	0.193	0.017	0.149	0.268
	(12.42)	(1.13)	(10.42)	(0.70)	(2.65)	(2.81)
Possess milch animals	0.055	0.064	0.041	0.058	0.059	0.030
	(10.03)	(6.91)	(3.37)	(10.94)	(6.48)	(2.54)
Possess draught animal	-0.063	-0.055	-0.096	-0.045	-0.035	-0.058
	(-11.35)	(-4.82)	(-7.80)	(-8.28)	(-3.11)	(-4.76)
Constant	5.598	5.503	5.579	5.440	5.222	4.927
	(173.48)	(101.27)	(73.62)	(138.01)	(88.24)	(56.63)

continued

Table 2-6, cont.

	Majority	SC	ST	Majority	SC	ST
State ag. Domestic product				-0.048	-0.018	0.104
per net sown area				(-4.65)	(-1.46)	(5.83)
Interaction terms with						
Literate not completed primary				0.015	0.006	-0.072
				(0.91)	(0.28)	(-2.23)
Primary completed				0.030	0.042	-0.080
				(2.03)	(1.85)	(-2.34)
Middle completed				0.053	0.043	-0.065
				(3.82)	(1.78)	(-1.72)
Secondary completed				0.054	0.044	-0.036
				(4.00)	(1.62)	(-0.75)
University completed				0.113	0.016	0.167
				(6.22)	(0.34)	(2.00)
Per capita land owned				0.099	0.206	0.005
				(17.13)	(7.05)	(0.19)
Proportion of irrigated land				-0.022	-0.056	-0.025
				(-2.12)	(-2.36)	(-0.70)
State dev. spending per pop.				0.385	0.474	0.839
(average 1991-3)				(15.95)	(16.74)	(15.50)
Interaction terms with						
Literate not completed primary				-0.057	-0.153	-0.417
				(-1.45)	(-2.60)	(-4.03)
Primary completed				-0.030	-0.191	-0.498
				(-0.82)	(-3.47)	(-4.48)
Middle completed				-0.032	-0.112	-0.341
				(-0.90)	(-1.88)	(-2.80)
Secondary completed				0.062	-0.001	-0.688
				(1.89)	(-0.01)	(-5.60)
University completed				0.266	0.203	-0.650
				(5.77)	(1.71)	(-3.25)
Per capita land owned				-0.174	0.098	0.188
				(-11.66)	(0.91)	(2.45)
Proportion of irrigated land				0.149	-0.015	-0.112
				(6.03)	(-0.25)	(-1.02)
Number of observations	41282	11252	5849	41282	11252	5849
R squared	0.202	0.097	0.181	0.237	0.138	0.228
F-statistics	579.59	67.98	73.00	378.85	54.09	51.81
Joint significance (F-statistics)						
Interaction terms of						
All interactions				122.34	34.79	23.02
Ag. Yield* education				9.62	1.37	3.05
Dev. Spending* education				10.79	4.56	11.11
Ag. Yield* land				146.80	25.48	0.26
Dev. Spending* land				79.32	0.41	3.36

Note: The numbers in parentheses are t-statistics.

Table 2-7 Average Marginal Effects of Schooling and Land

	No interaction terms			With interaction terms		
	Majority	SC	ST	Majority	SC	ST
Below primary	0.104	0.094	0.094	0.086	0.076	0.044
Primary	0.174	0.141	0.155	0.143	0.101	0.098
Middle	0.256	0.176	0.223	0.230	0.141	0.177
Secondary	0.423	0.307	0.378	0.379	0.253	0.335
University	0.582	0.401	0.601	0.380	0.359	0.605
Per capita land owned	0.197	0.339	0.227	0.230	0.447	0.258
Proportion of irrigated land	0.070	0.012	0.193	0.095	0.062	0.153

Note: Average marginal effects of schooling in the specification with interaction terms are calculated by evaluating at mean average yield or development spending in the whole sample.

Table 2-8 Decomposing Sources of Inequality in Log Per Capita Consumption in 1993

		Method	Reference	*Differences* Characte-ristics	*log p.c.* Returns	*Exp.* Total	*Percent* Characte-ristics	*of* structure
Panel A: Majority - SC								
Village FE?	No	Neumark	--------	0.129	0.110	0.240	54.0	46.0
	No	Oaxaca	majority	0.124	0.116	0.240	51.7	48.3
	No	Oaxaca	SC	0.103	0.136	0.240	42.9	56.7
Village FE?	Yes	Neumark	--------	0.125	0.115	0.240	52.1	47.9
	Yes	Oaxaca	majority	0.118	0.121	0.240	49.2	50.4
	Yes	Oaxaca	SC	0.102	0.137	0.240	42.5	57.1
Panel B: Majority - ST								
Village FE?	No	Neumark	--------	0.149	0.141	0.291	51.4	48.6
	No	Oaxaca	majority	0.134	0.157	0.291	46.0	54.0
	No	Oaxaca	ST	0.156	0.135	0.291	53.6	46.4
Village FE?	Yes	Neumark	--------	0.108	0.183	0.291	37.1	62.9
	Yes	Oaxaca	majority	0.106	0.185	0.291	36.4	63.6
	Yes	Oaxaca	ST	0.059	0.231	0.291	20.3	79.4

Note: Neumark decomposition results are based on the equation (6) in the text, Blinder-Oaxaca method with majority as reference on equation (4), with SC/ST as reference on equation (5).

Table 2-9 Decomposing Sources of Inequality in Log Per Capita Consumption by Neumark Method

		Year	*Differences*	*log p.c.*	*expenditure*	*Percent*	*of*
			Characte-ristics	Returns	Total	Characte-ristics	structure
Panel A:							
Majority - SC							
Village FE ?	No	1983	0.113	0.109	0.222	50.9	49.1
		1987	0.127	0.118	0.245	51.8	48.2
		1993	0.129	0.110	0.240	54.0	46.0
Village FE?	Yes	1983	0.110	0.112	0.222	49.5	50.5
		1987	0.122	0.123	0.245	49.8	50.2
		1993	0.125	0.115	0.240	52.1	47.9
Panel B:							
Majority - ST							
Village FE ?	No	1983	0.108	0.194	0.302	35.8	64.2
		1987	0.140	0.192	0.332	42.2	57.8
		1993	0.149	0.141	0.291	51.4	48.6
Village FE ?	Yes	1983	0.100	0.202	0.302	33.1	66.9
		1987	0.108	0.224	0.332	32.5	67.5
		1993	0.108	0.183	0.291	37.1	62.9

Note: Decomposition results are based on the equation (6) in the text.

Table 2-10 Decomposing Sources of Inequality in Log Per Capita Consumption for Mixed Villages

		Year	*Differences*	*log p.c.*	*expenditure*	*Percent*	*of*
			Characte-ristics	Returns	Total	Characte-ristics	structure
Majority -STs							
Village FE ?	No	1983	0.111	0.203	0.314	35.4	64.6
		1987	0.142	0.143	0.285	49.8	50.2
		1993	0.170	0.118	0.287	59.0	41.0
Village FE?	Yes	1983	0.104	0.210	0.285	33.1	66.9
		1987	0.119	0.166	0.314	41.8	58.2
		1993	0.135	0.152	0.287	47.0	53.0

Note: Decomposition results are based on the equation (6) in the text.

Table 2-11 Descriptive Statistics for Northeastern States, 1993

	Major states			Northeast states		
	Majority	SC	ST	Majority	SC	ST
log(per capita expenditure)	5.631	5.428	5.395	5.556	5.547	5.612
Highest adult education						
Not literate	0.316	0.509	0.556	0.216	0.227	0.218
Literate but not complete primary	0.138	0.143	0.154	0.193	0.203	0.195
Primary completed	0.153	0.131	0.119	0.198	0.253	0.231
Middle completed	0.174	0.114	0.095	0.199	0.186	0.201
Secondary completed	0.165	0.082	0.060	0.140	0.108	0.129
University completed	0.054	0.021	0.017	0.053	0.024	0.026
Per capita land owned	0.243	0.098	0.251	0.139	0.108	0.221
Proportion of irrigated land	0.338	0.230	0.128	0.056	0.074	0.050
Possession of milch animal	0.502	0.393	0.420	0.525	0.488	0.434
Possession of draught animal	0.306	0.201	0.461	0.334	0.265	0.252
Number of observations	42677	11661	5918	4579	669	2922

	Major states			Northeast states		
	Majority only village	ST only village	mixed with ST	Non-STs only village	STs only village	mixed with ST
log(per capita expenditure)	5.616	5.329	5.545	5.525	5.645	5.556
Highest adult education						
Not literate	0.327	0.590	0.407	0.250	0.224	0.175
Literate but not complete primary	0.148	0.156	0.148	0.201	0.210	0.169
Primary completed	0.150	0.107	0.144	0.178	0.239	0.207
Middle completed	0.168	0.078	0.144	0.181	0.174	0.254
Secondary completed	0.158	0.059	0.118	0.139	0.129	0.149
University completed	0.049	0.011	0.039	0.051	0.024	0.045
Per capita land owned	0.206	0.318	0.267	0.131	0.243	0.177
Proportion of irrigated land	0.300	0.121	0.179	0.049	0.031	0.094
Possession of milch animal	0.458	0.538	0.432	0.507	0.408	0.538
Possession of draught animal	0.269	0.622	0.396	0.325	0.193	0.457
Number of observations	15620	1688	5443	2702	2168	1094

Table 2-12 Determinants of Living Standards for Northeastern States, 1993

	Without FE			With FE		
	Majority	ST	Majority - ST	Majority	ST	Majority - ST
Female headed household	0.106	0.134	-0.029	0.068	0.066	0.002
	(4.39)	(5.86)	(-0.86)	(3.23)	(3.45)	(0.07)
Number of adult males	-0.087	-0.107	0.020	-0.071	-0.082	0.011
	(-9.67)	(-9.24)	(1.33)	(-9.08)	(-8.75)	(0.92)
Number of adult females	0.010	0.029	-0.019	0.017	0.016	0.001
	(0.99)	(2.25)	(-1.12)	(1.88)	(1.56)	(0.07)
Proportion of male15-59	0.165	0.209	-0.044	0.148	0.070	0.078
	(2.47)	(2.44)	(-0.40)	(2.55)	(1.05)	(0.86)
Proportion of female15-59	-0.433	-0.514	0.080	-0.392	-0.430	0.038
	(-5.02)	(-4.63)	(0.57)	(-5.21)	(-4.91)	(0.32)
Proportion of female>=60	-0.294	-0.366	0.072	-0.228	-0.308	0.080
	(-3.00)	(-2.82)	(0.44)	(-2.66)	(-3.03)	(0.62)
Age of head	-0.002	0.004	-0.006	-0.004	0.006	-0.010
	(-0.75)	(1.12)	(-1.34)	(-1.76)	(2.30)	(-2.50)
Age of head squared/100	0.004	-0.001	0.005	0.005	-0.005	0.010
Maximum education	(1.22)	(-0.33)	(1.01)	(1.77)	(-1.67)	(2.50)
Literate, not completed primary	0.072	-0.004	0.076	0.027	-0.007	0.034
	(4.15)	(-0.18)	(2.67)	(1.72)	(-0.38)	(1.08)
Primary completed	0.120	0.093	0.026	0.045	-0.003	0.048
	(6.97)	(4.70)	(0.99)	(2.81)	(0.17)	(2.00)
Middle completed	0.226	0.183	0.043	0.139	0.061	0.078
	(13.20)	(8.98)	(1.60)	(8.49)	(3.39)	(3.12)
Secondary completed	0.339	0.331	0.008	0.269	0.183	0.086
	(18.79)	(14.86)	(0.26)	(15.65)	(9.52)	(3.31)
University completed and above	0.530	0.514	0.016	0.412	0.317	0.095
	(23.87)	(13.88)	(0.36)	(19.60)	(10.01)	(2.44)
Per capita land owned (ha)	0.493	0.655	-0.162	0.631	0.669	-0.038
	(11.07)	(14.57)	(-2.56)	(14.27)	(14.81)	(-0.61)
Per capita land owned squared	-0.107	-0.192	0.086	-0.159	-0.190	0.031
	(-3.58)	(-7.54)	(2.18)	(-5.89)	(-8.75)	(0.91)
Proportion of irrigated land	-0.028	-0.048	0.020	0.043	0.047	-0.004
	(-1.33)	(-1.53)	(0.52)	(-1.59)	(1.09)	(-0.22)
Possess milch animals	0.053	-0.003	0.056	0.016	0.044	-0.028
	(4.47)	(-0.24)	(3.04)	(1.31)	(3.19)	(-1.27)
Possess draught animal	-0.056	-0.047	-0.009	0.001	0.003	-0.002
	(-4.53)	(-2.87)	(-0.44)	(-0.09)	(0.18)	(-0.02)
Constant	5.633	5.566	0.067	5.695	5.595	0.100
	(68.99)	(53.43)	(0.50)	(79.41)	(67.73)	(1.47)
Number of observations	4575	2918	7493	4575	2918	7493
Number of villages	588	389	821	588	389	821
R squared	0.234	0.339	0.244	0.220	0.210	0.211
Chow Test statistics			2.73			2.12

Note: The numbers in parentheses are t-statistics. The null hypothesis for Chow test in the specification with fixed effects is that all coefficients of household characteristics except village fixed effects in ST regression are same as those in majority regression.

Table 2-13 Distribution of Occupation by Social Groups and Mean Per Capita Expenditure

	Prop.	*(%)*		*Log per capita Exp.*		
	SC	majority	All	SC	majority	All
1983						
Professional/managerial	1.4	3.7	3.2	5.68	5.93	5.90
Clerical	1.1	1.7	1.6	5.68	5.89	5.86
Sales/service	5.3	7.3	6.9	5.37	5.54	5.52
Agricultural laborer	52.2	21.4	28.2	5.21	5.27	5.25
Cultivator	22.1	49.4	43.4	5.45	5.63	5.61
Other agriculture	4.2	5.1	4.9	5.39	5.61	5.57
Production, transport operator, laborer	13.8	11.3	11.9	5.45	5.52	5.50
1987						
Professional/managerial	2.2	5.0	4.4	5.87	6.10	6.08
Clerical	1.7	2.2	2.1	5.81	6.04	6.01
Sales/service	5.4	7.5	7.1	5.52	5.70	5.67
Agricultural laborer	49.6	18.7	25.1	5.32	5.38	5.36
Cultivator	22.8	51.5	45.5	5.54	5.74	5.72
Other agriculture	2.3	3.5	3.3	5.48	5.68	5.65
Production, transport operator, laborer	16.0	11.7	12.5	5.50	5.62	5.59
1993						
Professional/managerial	2.4	5.4	4.8	5.86	6.08	6.06
Clerical	1.5	2.3	2.1	5.83	6.02	5.99
Sales/service	5.4	7.8	7.3	5.52	5.74	5.70
Agricultural laborer	49.3	18.8	25.4	5.33	5.39	5.37
Cultivator	21.1	48.1	42.3	5.53	5.74	5.71
Other agriculture	4.4	6.3	5.9	5.52	5.73	5.69
Production, transport operator, laborer	15.9	11.2	12.3	5.51	5.62	5.59

Note: NCO 1968 1 digit code are used for classifying professional/managerial workers (0, 1, 2), clerical workers (3), sales/service workers (4, 5), and production workers (7, 8, 9). NCO 1968 2 digit code are used for agricultural laborer (63), cultivator (61), and other agriculture (60, 62, 64, 65, 66, 67, 68).

Table 2-14 Determinants of Living Standards with Occupational Dummies, 1993

	Without village		FE	with village		FE
	Majority	SC	Majority - SC	Majority	SC	Majority - SC
Occupational dummies	0.249	0.297	-0.048	0.219	0.267	-0.048
Professional/managerial	(14.25)	(7.40)	(-1.04)	(13.85)	(6.68)	(-1.20)
Clerical	0.208	0.274	-0.066	0.142	0.174	-0.032
	(9.88)	(6.15)	(-1.27)	(7.49)	(3.97)	(-0.71)
Sales/service	0.069	0.067	0.002	0.044	0.064	-0.020
	(4.25)	(1.97)	(0.05)	(3.01)	(1.88)	(-0.57)
Agricultural laborer	-0.173	-0.081	-0.092	-0.172	-0.085	-0.087
	(-11.62)	(-2.72)	(-2.63)	(-12.74)	(-2.89)	(-2.81)
Cultivator	-0.014	0.026	-0.040	-0.007	0.018	-0.025
	(-0.96)	(0.82)	(-1.08)	(-0.51)	(0.58)	(-0.78)
Other agriculture	0.037	0.071	-0.034	-0.013	0.019	-0.032
	(2.22)	(2.03)	(-0.83)	(-0.79)	(0.52)	(-0.89)
Production/non-farm laborers	0.002	0.062	-0.060	-0.054	0.012	-0.066
	(0.13)	(1.97)	(-1.67)	(-3.80)	(0.39)	(-2.06)
Female headed household	0.130	0.124	0.006	0.107	0.110	-0.003
	(12.70)	(6.66)	(0.27)	(11.64)	(5.91)	(-0.16)
Number of adult males	-0.073	-0.054	-0.019	-0.067	-0.058	-0.009
	(-17.88)	(-6.36)	(-1.90)	(-18.28)	(-6.81)	(-1.00)
Number of adult females	-0.023	-0.034	0.011	-0.022	-0.022	0.000
	(-5.23)	(-3.66)	(1.00)	(-5.70)	(-2.38)	(0.00)
Proportion of male15-59	-0.016	-0.029	0.013	-0.004	0.014	-0.018
(over adults)	(-0.70)	(-0.75)	(0.28)	(-0.19)	(0.37)	(-0.44)
Proportion of female15-59	-0.387	-0.343	-0.044	-0.376	-0.331	-0.045
	(-12.13)	(-5.97)	(-0.65)	(-13.30)	(-5.82)	(-0.75)
Proportion of female>=60	-0.369	-0.291	-0.078	-0.403	-0.303	-0.100
	(-10.89)	(-4.72)	(-1.07)	(-13.42)	(-4.99)	(-1.56)
Age of head	0.002	0.002	0.000	0.002	-0.002	0.004
	(2.35)	(0.84)	(0.00)	(2.04)	(-1.17)	(2.00)
Age of head squared/100	-0.001	-0.001	0.000	-0.001	0.003	-0.004
Maximum education	(-0.41)	(-0.23)	(0.00)	(-0.51)	(1.66)	(-2.00)
Literate, not completed prim.	0.081	0.076	0.005	0.039	0.000	0.039
	(10.44)	(6.20)	(0.33)	(5.48)	(0.03)	(3.00)
Primary completed	0.137	0.110	0.027	0.065	0.031	0.034
	(18.27)	(8.56)	(1.80)	(9.27)	(2.31)	(2.43)
Middle completed	0.201	0.138	0.063	0.122	0.053	0.069
	(27.61)	(10.09)	(3.94)	(17.46)	(3.74)	(4.93)
Secondary completed	0.330	0.225	0.105	0.239	0.145	0.094
	(43.85)	(14.45)	(5.83)	(33.09)	(8.99)	(5.88)
University completed & above	0.446	0.291	0.155	0.365	0.175	0.190
	(42.74)	(10.39)	(5.00)	(37.32)	(6.21)	(6.79)
Per capita land owned (ha)	0.201	0.309	-0.108	0.196	0.346	-0.150
	(49.07)	(12.84)	(-4.15)	(49.34)	(12.68)	(-6.25)
(Per capita land owned)^2	-0.005	-0.035	0.030	-0.005	-0.040	0.035
	(-28.26)	(-6.10)	(5.00)	(-29.85)	(-6.68)	(7.00)

continued

Table 2-14, Continued.

	Majority	SC	Majority - SC	Majority	SC	Majority - SC
Proportion of irrigated land	0.073	0.011	0.062	0.092	0.062	0.030
	(12.46)	(1.03)	(4.77)	(12.74)	(4.16)	(2.50)
Possess milch animals	0.054	0.057	-0.003	0.062	0.076	-0.014
	(10.03)	(6.30)	(-0.27)	(11.62)	(7.53)	(-1.40)
Possess draught animal	-0.061	-0.059	-0.002	-0.009	-0.020	0.011
	(-11.07)	(-5.18)	(-0.15)	(-1.50)	(-1.62)	(0.92)
Constant	5.687	5.581	0.106	5.732	5.654	0.078
	(171.68)	(96.81)	(1.54)	(193.07)	(98.91)	(1.28)
Number of observations	42677	11661	54338	42677	11661	54338
Number of villages	5796	3782	5939	5796	3782	5796
R squared	0.232	0.129	0.242	0.221	0.114	0.156
F-statistics	517.29	69.76	341.35	506.52	49.85	39.86
Chow Test statistics			17.06			19.17

Note: The numbers in parentheses are t-statistics.

Table 2-15 Decomposing Sources of Inequality with Occupation Dummies by Neumark Method

		Year	*Differences log p.c. expenditure*			*Percent of*	
			Characte-ristics	Returns	Total	Character-ristrics	structure
Majority - SC							
Village FE?	No	1983	0.155	0.067	0.222	69.8	30.2
		1987	0.168	0.078	0.245	68.3	31.7
		1993	0.165	0.074	0.240	69.0	31.0
Village FE?	Yes	1983	0.152	0.070	0.222	68.5	31.5
		1987	0.163	0.083	0.245	66.3	33.7
		1993	0.159	0.081	0.240	66.3	33.8

Note: Decomposition results are based on the equation (6) in the text.

Table 2-16 Multinomial Logit Regression for Non-SC Households, 1993

	Occupation category					
	Profess-ional managerial	Clerical	Sales Service	Cultivator	Other agri-culture	Produc-tion worker
Female headed household	-0.079	-0.522	-0.201	0.402	0.852	-0.214
	(-0.64)	(-2.73)	(-1.97)	(5.13)	(9.33)	(-2.36)
Number of adult males	-0.291	-0.335	-0.119	0.068	-0.074	-0.103
	(-5.71)	(-4.80)	(-2.69)	(1.92)	(-1.67)	(-2.54)
Number of adult females	0.122	0.242	0.123	0.185	0.187	0.205
	(2.19)	(3.16)	(2.54)	(4.91)	(4.02)	(4.68)
Proportion of male15-59	0.894	0.667	0.139	-0.813	-0.445	0.214
(over adults)	(2.58)	(1.23)	(0.57)	(-4.53)	(-1.97)	(0.97)
Proportion of female15-59	-0.568	-1.039	-0.886	-0.772	-1.366	-0.864
	(-1.22)	(-1.49)	(-2.57)	(-2.88)	(-4.23)	(-2.78)
Proportion of female>=60	0.231	-0.525	-0.221	-0.862	-1.489	-1.001
	(0.45)	(-0.67)	(-0.59)	(-2.97)	(-4.30)	(-2.88)
Age of head	0.122	0.163	0.021	-0.007	0.011	-0.015
	(7.94)	(6.75)	(1.88)	(-0.86)	(0.97)	(-1.53)
Age of head squared/100	-0.001	-0.002	-0.022	0.013	0.009	0.008
Household head's education	(-7.26)	(-6.72)	(-1.77)	(1.39)	(0.82)	(-0.69)
Literate, not completed primary	-0.200	-0.223	0.610	0.397	0.498	0.499
	(-2.01)	(-1.44)	(10.64)	(8.57)	(8.01)	(9.98)
Primary completed	1.309	1.716	0.985	0.621	0.692	0.812
	(10.46)	(7.68)	(15.25)	(12.51)	(9.45)	(15.25)
Middle completed	2.097	3.082	1.600	1.010	1.365	1.156
	(18.47)	(16.21)	(25.17)	(19.71)	(19.85)	(20.67)
Secondary completed	4.414	5.050	2.521	1.574	2.195	1.763
	(41.88)	(27.60)	(33.23)	(23.96)	(27.36)	(24.55)
University completed and above	6.007	6.189	2.785	1.735	2.802	1.752
	(39.53)	(28.49)	(18.99)	(13.04)	(19.22)	(11.58)
Per capita land owned	3.526	2.946	1.855	4.841	3.029	0.172
	(25.37)	(16.15)	(11.71)	(40.09)	(21.55)	(1.00)
Proportion of irrigated land	-0.201	-0.170	-0.082	1.776	-0.328	-0.053
	(-2.74)	(-1.69)	(-1.31)	(42.02)	(-4.82)	(-0.94)
Possess milch animals	-0.043	-0.172	-0.169	0.916	0.317	-0.076
	(-0.72)	(-2.07)	(-3.43)	(24.87)	(6.15)	(-1.76)
Possess draught animal	-0.116	-0.170	-0.428	1.177	-0.326	-0.252
	(-1.59)	(-1.64)	(-6.42)	(28.13)	(-4.93)	(-4.36)
Muslim household	0.747	-0.160	0.674	0.197	0.340	0.440
	(9.12)	(-1.07)	(11.82)	(3.94)	(5.02)	(8.73)
Constant	-6.680	-8.074	-2.072	-1.831	-2.358	-0.465
	(-14.85)	(-12.05)	(-6.57)	(-7.42)	(-7.18)	(-1.68)
Number of observations	41378					
Log likelihood	-46666					
Pseudo R squared	0.263					

Note: Comparison group is Agricultural laborer. The numbers in the parentheses are t-statistics.

Table 2-17 Inequality Decomposition: SC vs. Majority

	G	E	D	I	II	III	IV
	lnY_n-lnY_s	$b(X_n-X_s)$	$X_n(b_n-b)$ - $X_s(b_s-b)$	P_s*E	P_s*D	$(p_n-\hat{p}_s)$ *lnY_n	$(\hat{p}_s-p_s)$ *lnY_n
1983							
Prof./tech/managerial	0.249	0.101	0.148	0.001	0.002	0.083	0.053
clerical	0.210	0.120	0.090	0.001	0.001	0.029	0.006
sales/service	0.173	0.084	0.089	0.004	0.005	-0.068	0.178
Agricultural labor	0.063	0.020	0.043	0.010	0.022	-0.702	-0.924
cultivators	0.177	0.078	0.099	0.017	0.022	0.913	0.625
other agriculture	0.222	0.078	0.144	0.003	0.006	-0.022	0.073
Production worker	0.065	0.021	0.044	0.003	0.006	-0.188	0.050
Total	**0.211**			**0.041**	**0.064**	**0.045**	**0.061**
				(19%)	(30%)	(21%)	(29%)
1987							
Prof./tech/managerial	0.231	0.133	0.098	0.003	0.002	0.122	0.049
clerical	0.233	0.077	0.156	0.001	0.003	0.036	-0.006
sales/service	0.183	0.082	0.102	0.004	0.005	-0.074	0.194
Agricultural labor	0.054	0.008	0.046	0.004	0.023	-0.754	-0.910
cultivators	0.205	0.099	0.105	0.023	0.024	0.980	0.674
other agriculture	0.196	0.113	0.083	0.003	0.002	-0.040	0.109
Production worker	0.120	0.035	0.085	0.006	0.014	-0.197	-0.045
Total	**0.254**			**0.043**	**0.073**	**0.073**	**0.065**
				(17%)	(29%)	(29%)	(25%)
1993							
Prof./tech/managerial	0.223	0.110	0.113	0.003	0.003	0.128	0.055
clerical	0.184	0.062	0.122	0.001	0.002	0.042	0.006
sales/service	0.218	0.097	0.121	0.005	0.007	-0.046	0.184
Agricultural labor	0.059	0.019	0.040	0.009	0.020	-0.852	-0.792
cultivators	0.203	0.102	0.101	0.022	0.021	1.054	0.501
other agriculture	0.206	0.152	0.054	0.007	0.002	-0.023	0.134
Production worker	0.112	0.037	0.075	0.006	0.012	-0.242	-0.023
Total	**0.243**			**0.052**	**0.066**	**0.060**	**0.065**
				(21%)	(27%)	(25%)	(27%)

Note: Decomposition results are based on the equation (7) in the text.

Appendix Table 2-1 Descriptive Statistics, 1983 and 1987

	1983			1987		
	Majority	SC	ST	Majority	SC	ST
Log (per capita expenditure)	5.54	5.311	5.232	5.617	5.410	5.330
(1993 price level Rs.)	(0.578)	(0.539)	(0.552)	(0.530)	(0.478)	(0.498)
Female headed household	0.109	0.096	0.079	0.108	0.100	0.072
	(0.312)	(0.295)	(0.269)	(0.310)	(0.300)	(0.258)
Number of male adult members	1.587	1.443	1.483	1.601	1.435	1.488
	(1.063)	(0.907)	(0.927)	(1.056)	(0.900)	(0.914)
Number of male adult members	1.591	1.432	1.481	1.584	1.409	1.473
Proportion of household members:	(0.935)	(0.785)	(0.845)	(0.924)	(0.762)	(0.833)
Males age 15-59	0.430	0.437	0.453	0.434	0.446	0.459
	(0.218)	(0.211)	(0.207)	(0.216)	(0.210)	(0.198)
Females age 15-59	0.451	0.459	0.460	0.453	0.457	0.456
	(0.210)	(0.201)	(0.198)	(0.207)	(0.203)	(0.187)
Males older than and equal to 60	0.057	0.051	0.041	0.055	0.046	0.040
	(0.142)	(0.138)	(0.119)	(0.137)	(0.133)	(0.125)
Females older than and equal to 60	0.062	0.052	0.046	0.058	0.050	0.046
	(0.159)	(0.152)	(0.134)	(0.155)	(0.148)	(0.143)
Age of household head	44.526	42.594	41.407	44.360	42.011	41.216
Maximum education in household:	(14.148)	(13.503)	(13.178)	(13.941)	(13.547)	(13.113)
Note literate	0.387	0.597	0.641	0.269	0.442	0.515
	(0.487)	(0.491)	(0.480)	(0.444)	(0.497)	(0.500)
Literate but not completed primary	0.137	0.137	0.145	0.165	0.182	0.183
	(0.344)	(0.343)	(0.352)	(0.371)	(0.386)	(0.387)
Primary completed	0.188	0.132	0.111	0.195	0.169	0.143
	(0.391)	(0.338)	(0.314)	(0.396)	(0.375)	(0.350)
Middle completed	0.148	0.084	0.063	0.180	0.125	0.099
	(0.355)	(0.277)	(0.243)	(0.384)	(0.330)	(0.299)
Secondary completed	0.105	0.037	0.025	0.151	0.068	0.049
	(0.306)	(0.189)	(0.157)	(0.358)	(0.251)	(0.216)
University completed and above	0.035	0.014	0.015	0.040	0.015	0.011
	(0.184)	(0.118)	(0.120)	(0.196)	(0.121)	(0.105)
Per capita land owned (hectare)	0.685	0.244	0.713	0.277	0.105	0.264
	(1.620)	(0.611)	(1.391)	(0.702)	(0.282)	(0.490)
Proportion of land irrigated over	0.298	0.198	0.082	0.319	0.226	0.139
cultivated land	(0.418)	(0.379)	(0.241)	(0.430)	(0.401)	(0.314)
Number of observations	48262	13302	7299	51216	13243	7372

Note: The numbers in parentheses are t-statistics.

Appendix Table 2-2 Determinants of Living Standards, 1983

	Without	village	FE	with	village	FE
	Majority	SC	ST	Majority	SC	ST
Female headed household	0.148	0.105	0.223	0.136	0.089	0.183
	(14.23)	(4.87)	(7.27)	(13.22)	(4.07)	(6.27)
Number of adult males	-0.066	-0.049	-0.075	-0.061	-0.051	-0.081
	(-15.39)	(-5.00)	(-6.21)	(-14.46)	(-5.12)	(-7.09)
Number of adult females	-0.018	-0.026	0.004	-0.022	-0.027	0.015
	(-3.84)	(-2.43)	(0.03)	(-4.92)	(-2.58)	(1.20)
Proportion of male15-59	0.010	0.029	-0.066	0.004	0.051	-0.008
(over adults)	(0.46)	(0.66)	(-0.98)	(0.20)	(1.15)	(-0.12)
Proportion of female15-59	-0.471	-0.307	-0.640	-0.450	-0.254	-0.563
	(-14.85)	(-4.69)	(-6.79)	(-14.47)	(-3.89)	(-6.38)
Proportion of female>=60	-0.405	-0.361	-0.672	-0.381	-0.337	-0.656
	(-12.12)	(-5.20)	(-6.61)	(-11.65)	(-4.87)	(-6.86)
Age of head	-0.003	-0.008	-0.005	-0.002	-0.010	-0.006
	(-2.86)	(-4.19)	(-1.80)	(-2.50)	(-4.77)	(-2.26)
Age of head squared/100	0.004	0.010	0.006	0.003	0.012	0.007
Maximum education	(3.60)	(4.47)	(1.94)	(3.12)	(5.22)	(2.23)
Literate, not completed prim	0.071	0.039	0.142	0.059	0.034	0.079
	(9.35)	(2.79)	(8.27)	(7.91)	(2.44)	(4.59)
Primary completed	0.166	0.128	0.198	0.155	0.098	0.128
	(24.33)	(9.22)	(10.21)	(22.68)	(6.98)	(6.85)
Middle completed	0.40	0.197	0.299	0.225	0.182	0.198
	(31.90)	(11.41)	(12.09)	(29.91)	(10.40)	(8.28)
Secondary completed	0.435	0.368	0.468	0.411	0.342	0.330
	(50.18)	(15.09)	(12.57)	(47.57)	(13.83)	(8.96)
Univ. completed & above	0.497	0.240	0.342	0.488	0.204	0.317
	(36.64)	(6.23)	(6.44)	(36.15)	(5.14)	(6.14)
Per capita land owned(ha)	0.106	0.190	0.095	0.109	0.198	0.108
	(48.93)	(17.44)	(13.99)	(50.14)	(17.35)	(15.97)
(Per capita land owned)^2	-0.002	-0.012	-0.003	-0.002	-0.013	-0.003
	(-26.11)	(-8.78)	(-8.12)	(-26.40)	(-9.00)	(-9.03)
Prop. of irrigated land	0.118	0.062	0.219	0.117	0.047	0.190
	(19.97)	(4.99)	(8.80)	(18.78)	(3.53)	(6.85)
Constant	5.699	5.616	5.624	5.693	5.611	5.600
	(189.45)	(97.04)	(68.74)	(193.01)	(97.62)	(73.21)
Number of observations	48262	13302	7299	48262	13302	7299
Number of villages	1903	1626	1150	1903	1626	1150
R squared	0.147	0.067	0.513	0.147	0.067	0.107
F-statistics	521.29	60.44	58.13	507.87	53.92	47.78

Note: The numbers in parentheses are t-statistics.

Appendix Table 2-3 Determinants of Living Standards, 1987

	without village FE			with village FE		
	Majority	SC	ST	Majority	SC	ST
Female headed household	0.116	0.114	0.218	0.079	0.086	0.141
	(12.08)	(6.26)	(8.00)	(9.02)	(4.69)	(5.89)
Number of adult males	-0.082	-0.074	-0.102	-0.067	-0.070	-0.068
	(-21.58)	(-9.05)	(-9.35)	(-19.62)	(-8.52)	(-7.27)
Number of adult females	-0.023	-0.027	-0.011	-0.026	-0.010	-0.008
	(-5.65)	(-3.03)	(-0.92)	(-7.04)	(-1.16)	(-0.77)
Proportion of male15-59	-0.031	-0.014	-0.030	-0.054	0.015	-0.088
(over adults)	(-1.47)	(-0.34)	(-0.53)	(-2.82)	(0.38)	(-1.77)
Prop. of female15-59	-0.479	-0.480	-0.627	-0.425	-0.407	-0.466
	(-15.85)	(-8.47)	(-7.83)	(-15.70)	(-7.27)	(-6.68)
Proportion of female>=60	-0.394	-0.476	-0.588	-0.380	-0.430	-0.451
	(-12.27)	(-7.88)	(-6.92)	(-13.27)	(-7.21)	(-6.15)
Age of head	0.001	-0.004	-0.007	0.001	-0.003	-0.003
	(0.50)	(-2.04)	(-2.82)	(1.24)	(-1.61)	(-1.22)
Age of head squared/100	0.001	0.005	0.009	0.001	0.004	0.004
Maximum education	(1.37)	(2.44)	(3.40)	(0.38)	(2.02)	(1.65)
Literate, not completed prim	0.053	0.017	0.077	0.006	-0.017	-0.018
	(7.30)	(1.46)	(5.26)	(0.95)	(-1.45)	(-1.36)
Primary completed	0.151	0.121	0.152	0.079	0.028	0.044
	(21.88)	(10.56)	(9.58)	(11.96)	(2.30)	(2.98)
Middle completed	0.252	0.173	0.238	0.175	0.109	0.127
	(35.90)	(13.29)	(13.11)	(25.56)	(7.82)	(7.54)
Secondary completed	0.445	0.342	0.505	0.337	0.250	0.285
	(60.85)	(21.25)	(21.34)	(46.25)	(14.76)	(12.60)
Univ. completed & above	0.664	0.458	0.660	0.543	0.387	0.408
	(62.76)	(15.13)	(15.01)	(53.54)	(12.91)	(9.67)
Per capita land owned	0.197	0.343	0.216	0.223	0.448	0.319
	(56.67)	(17.51)	(14.42)	(63.96)	(19.67)	(22.53)
(Per capita land owned)^2	-0.005	-0.036	-0.015	-0.006	-0.054	-0.026
	(-30.06)	(-7.71)	(-6.44)	(-36.89)	(-11.41)	(-12.93)
Prop. of irrigated land	0.078	-0.010	0.163	0.110	0.059	0.066
	(14.98)	(-0.93)	(9.63)	(16.69)	(4.20)	(2.99)
Constant	5.750	5.763	5.755	5.759	5.685	5.624
	(200.62)	(113.46)	(83.36)	(223.86)	(112.99)	(93.37)
number of observations	51216	13243	7372	51216	13243	7372
number of villages	6733	4271	1863	6733	4271	1863
R squared	0.200	0.104	0.169	0.193	0.093	0.143
F-statistics	796.36	96.68	99.98	802.93	79.38	75.90

Note: The numbers in parentheses are t-statistics.

Appendix Table 2-4 Determinants of Living Standards with Interaction Terms

		With interaction terms				
	Average	Agri. yield		State develop. spending		
	Majority	SC	ST	Majority	SC	ST
Female headed household	0.123	0.126	0.129	0.121	0.123	0.131
	(11.61)	(6.66)	(4.61)	(11.56)	(6.37)	(4.82)
Number of adult males	-0.078	-0.057	-0.087	-0.078	-0.056	-0.086
	(-18.26)	(-6.60)	(-7.33)	(-18.56)	(-6.29)	(-7.40)
Number of adult females	-0.023	-0.034	-0.013	-0.021	-0.034	-0.013
	(-5.01)	(-3.58)	(-1.06)	(-4.74)	(-3.49)	(-1.06)
Proportion of male15-59	-0.012	0.007	0.018	-0.013	-0.003	0.011
(over adults)	(-0.53)	(0.18)	(0.30)	(-0.57)	(-0.07)	(0.19)
Proportion of female15-59	-0.395	-0.340	-0.476	-0.412	-0.320	-0.490
	(-11.83)	(-5.76)	(-5.48)	(-12.52)	(-5.31)	(-5.79)
Proportion of female>=60	-0.364	-0.278	-0.453	-0.389	-0.264	-0.460
	(-10.29)	(-4.40)	(-4.74)	(-11.14)	(-4.10)	(-4.94)
Age of head	0.004	0.001	-0.002	0.002	0.002	-0.003
	(3.59)	(0.74)	(-0.58)	(2.10)	(1.22)	(-0.98)
Age of head squared/100	-0.002	-0.000	0.005	-0.001	-0.001	0.005
	(-1.61)	(-0.18)	(1.54)	(-0.29)	(-0.56)	(1.84)
Maximum education						
Literate	0.067	0.186	0.117	0.137	0.100	0.330
	(2.96)	(4.33)	(2.95)	(4.80)	(2.94)	(4.34)
Primary completed	0.114	0.252	0.186	0.177	0.080	0.448
	(5.28)	(5.89)	(4.61)	(6.44)	(2.13)	(5.46)
Middle completed	0.159	0.243	0.264	0.280	0.125	0.424
	(7.79)	(5.43)	(5.77)	(10.73)	(3.17)	(4.91)
Secondary completed	0.287	0.268	0.357	0.363	0.212	0.825
	(14.08)	(5.48)	(6.31)	(14.73)	(4.84)	(8.89)
University and above	0.412	0.234	0.358	0.423	0.430	1.138
	(14.70)	(2.64)	(3.49)	(12.52)	(5.53)	(7.83)
Per capita land owned (ha)	0.107	0.401	0.249	0.249	0.214	0.128
	(16.21)	(5.65)	(8.76)	(21.56)	(6.29)	(2.50)
Per capita land squared	-0.006	-0.040	-0.018	-0.004	-0.054	-0.020
	(-32.00)	(-5.32)	(-7.49)	(-25.08)	(-8.60)	(-8.30)
Proportion of irrigated land	0.064	0.040	0.181	-0.012	0.152	0.206
	(3.90)	(1.07)	(4.30)	(-0.67)	(4.21)	(2.49)
Possess milch animals	0.050	0.061	0.042	0.062	0.063	0.030
	(9.14)	(6.68)	(3.44)	(11.52)	(6.77)	(2.52)
Possess draught animal	-0.065	-0.028	-0.095	-0.044	-0.061	-0.066
	(-11.68)	(-2.53)	(-7.64)	(-8.02)	(-5.34)	(-5.41)
Constant	5.727	5.199	5.563	5.369	5.523	5.581
	(163.50)	(91.90)	(71.27)	(151.54)	(96.39)	(73.72)

continued

Appendix Table 2-4, cont.

	Majority	SC	ST	Majority	SC	ST
State ag. Domestic product per net sown area	-0.090 (-8.76)	0.472 (16.62)	0.023 (1.34)			
State dev. spending per pop. (average 1991-3)				0.393 (16.64)	-0.015 (-1.23)	0.749 (14.35)
Interaction terms with						
Literate, completed primary	0.027 (1.69)	-0.148 (-2.54)	-0.018 (-0.54)	-0.070 (-1.82)	-0.004 (-0.17)	-0.353 (-3.46)
Primary completed	0.047 (3.16)	-0.197 (-3.58)	-0.031 (-0.90)	-0.049 (-1.37)	0.040 (1.73)	-0.435 (-4.00)
Middle completed	0.072 (5.21)	-0.128 (-2.15)	-0.038 (-1.01)	-0.067 (-1.92)	0.033 (1.34)	-0.298 (-2.53)
Secondary completed	0.096 (7.00)	-0.005 (-0.08)	0.018 (0.37)	0.033 (1.01)	0.062 (2.25)	-0.644 (-5.42)
University completed	0.117 (6.38)	0.189 (1.61)	0.208 (2.52)	0.206 (4.50)	-0.023 (-0.48)	-0.753 (-3.91)
Per capita land owned	0.095 (17.17)	-0.072 (-0.69)	-0.015 (-0.56)	-0.086 (-6.13)	0.166 (5.68)	0.172 (2.33)
Proportion of irrigated land	-0.001 (-0.09)	0.041 (0.74)	0.012 (0.32)	0.161 (6.55)	-0.100 (-4.24)	-0.060 (-0.55)
Number of observations	41282	11252	5849	41282	11252	5849
R squared	0.209	0.134	0.182	0.204	0.100	0.222
F-statistics	420.25	68.14	51.00	422.75	49.26	65.21

Note: The numbers in parentheses are t-statistics.

Appendix Table 2-5 Determinants of Living Standards, 1983 (Mixed Villages with ST)

	without village		FE	with village		FE
	Majority	ST	Majority - ST	Majority	ST	Majority - ST
Female headed household	0.144	0.219	-0.075	0.135	0.175	-0.077
	(12.11)	(6.99)	(-2.21)	(11.45)	(5.86)	(-2.28)
Number of adult males	-0.061	-0.073	0.011	-0.058	-0.080	0.021
	(-12.42)	(-5.83)	(0.84)	(-11.86)	(-6.83)	(1.59)
Number of adult females	-0.021	-0.023	-0.019	-0.026	-0.014	-0.026
	(-4.03)	(-0.16)	(-1.27)	(-5.06)	(-1.06)	(-1.73)
Proportion of male15-59	-0.002	-0.075	0.073	0.005	-0.020	0.045
	(-0.08)	(-1.08)	(0.97)	(0.18)	(-0.30)	(0.61)
Proportion of female15-59	-0.467	-0.640	0.174	-0.435	-0.574	0.164
	(-12.72)	(-6.66)	(1.66)	(-12.06)	(-6.36)	(1.59)
Proportion of female>=60	-0.428	-0.687	0.259	-0.392	-0.689	0.244
	(-11.06)	(-6.60)	(2.30)	(-10.31)	(-7.03)	(2.20)
Age of head	-0.003	-0.005	0.002	-0.002	-0.005	0.002
	(-2.43)	(-1.68)	(0.66)	(-2.05)	(-2.07)	(0.50)
Age of head squared/100	0.004	0.006	-0.002	0.003	0.006	-0.002
Maximum education	(2.97)	(1.81)	(-0.67)	(2.57)	(2.05)	(-0.54)
Literate, not completed primary	0.066	0.140	-0.074	0.059	0.076	-0.065
	(7.61)	(7.93)	(-3.71)	(6.85)	(4.37)	(-3.28)
Primary completed	0.164	0.194	-0.030	0.159	0.174	-0.015
	(20.83)	(9.75)	(-1.38)	(20.60)	(6.47)	(-0.68)
Middle completed	0.226	0.300	-0.075	0.217	0.279	-0.062
	(25.84)	(11.87)	(-2.75)	(25.41)	(8.05)	(-2.29)
Secondary completed	0.426	0.468	-0.042	0.410	0.433	-0.023
	(42.58)	(12.29)	(-1.05)	(41.31)	(8.84)	(-0.58)
Univ. completed & above	0.502	0.340	0.162	0.498	0.333	0.165
	(31.76)	(6.25)	(2.82)	(31.73)	(5.98)	(2.91)
Per capita land owned (ha)	0.108	0.096	0.011	0.111	0.105	0.006
	(43.34)	(13.76)	(1.49)	(44.63)	(15.69)	(0.74)
(Per capita land owned)^2	-0.002	-0.003	0.001	-0.002	-0.003	0.001
	(-23.83)	(-8.17)	(2.80)	(-24.17)	(-9.02)	(2.98)
Proportion of irrigated land	0.126	0.225	-0.099	0.126	0.198	-0.072
	(18.14)	(8.87)	(-3.71)	(17.01)	(6.79)	(-2.67)
Constant	5.716	5.623	0.093	5.693	5.605	0.094
	(163.96)	(67.21)	(1.01)	(165.84)	(71.54)	(1.04)
Number of observations	36394	7047	43443	36394	7047	43441
Number of villages	1125	1125	1125	1125	1125	1125
R squared	0.147	0.111	0.176	0.147	0.106	0.176
F-statistics	393.17	55.93	281.98	392.06	45.94	268.12

Note: The numbers in parentheses are t-statistics.

Appendix Table 2-6 Determinants of Living Standards, 1987 (Mixed Villages with ST)

	without village		FE	with village		FE
	Majority	ST	Majority - ST	Majority	ST	Majority - ST
Female headed household	0.214	0.205	0.009	0.158	0.137	0.021
	(8.83)	(6.23)	(0.22)	(6.46)	(4.43)	(0.56)
Number of adult males	-0.098	-0.096	-0.002	-0.084	-0.086	0.002
	(-11.00)	(-7.06)	(-0.14)	(-9.67)	(-5.87)	(0.12)
Number of adult females	-0.001	-0.022	0.022	-0.003	-0.015	0.012
	(-0.01)	(-1.51)	(1.22)	(-0.42)	(-1.12)	(0.75)
Proportion of male15-59	-0.031	-0.076	0.046	-0.068	-0.099	0.031
	(-0.59)	(-1.08)	(0.50)	(-1.31)	(-2.49)	(0.39)
Proportion of female15-59	-0.641	-0.680	0.039	-0.619	-0.556	-0.063
	(-8.90)	(-6.85)	(0.31)	(-8.91)	(-5.95)	(-0.56)
Proportion of female>=60	-0.569	-0.660	0.092	-0.571	-0.615	0.044
	(-7.38)	(-6.34)	(0.69)	(-7.84)	(-5.41)	(-0.37)
Age of head	-0.005	-0.007	0.001	-0.002	-0.004	0.002
	(-2.48)	(-2.15)	(0.32)	(-0.74)	(-0.20)	(0.51)
Age of head squared/100	-0.005	0.009	-0.002	0.003	0.005	-0.002
Maximum education	(-2.48)	(2.45)	(-0.42)	(1.14)	(0.38)	(-0.41)
Literate, not completed prim	0.066	0.048	0.018	0.014	-0.017	0.031
	(3.89)	(2.58)	(0.70)	(0.03)	(-1.39)	(1.33)
Primary completed	0.185	0.129	0.056	0.103	0.073	0.030
	(11.49)	(6.46)	(2.15)	(5.22)	(2.72)	(1.26)
Middle completed	0.298	0.241	0.057	0.212	0.184	0.028
	(17.92)	(10.46)	(1.97)	(11.27)	(7.00)	(1.03)
Secondary completed	0.491	0.519	-0.027	0.389	0.402	-0.013
	(28.29)	(17.65)	(-0.77)	(19.85)	(10.26)	(-0.42)
Univ. completed & above	0.723	0.671	0.052	0.598	0.554	0.044
	(29.22)	(12.87)	(0.87)	(23.13)	(7.33)	(0.81)
Per capita land owned (ha)	0.176	0.215	-0.039	0.203	0.302	-0.099
	(23.30)	(11.43)	(-1.86)	(26.25)	(16.92)	(-5.04)
(Per capita land owned)^2	-0.005	-0.015	0.010	-0.006	-0.024	0.018
	(-12.86)	(-5.84)	(3.66)	(-15.40)	(-10.78)	(7.14)
Proportion of irrigated land	0.112	0.143	-0.030	0.109	0.101	0.008
	(8.44)	(6.92)	(-1.20)	(7.23)	(1.22)	(0.33)
Constant	5.932	5.875	0.057	5.903	5.828	0.075
	(88.80)	(68.43)	(0.52)	(95.55)	(69.44)	(0.75)
Number of observations	9187	4592	13779	9187	4592	13779
Number of villages	1557	1557	1557	1557	1557	1557
R squared	0.226	0.179	0.258	0.219	0.155	0.252
F-statistics	168.61	63.70	146.27	149.83	46.33	137.17

Note: The numbers in parentheses are t-statistics.

Appendix Table 2-7 Determinants of Living Standards, 1993 (ST Mixed Villages Only)

	without FE			with FE		
	Majority	ST	Majority - ST	Majority	ST	Majority - ST
Female headed household	0.166	0.165	0.001	0.127	0.140	-0.013
	(5.95)	(4.77)	(0.02)	(4.98)	(4.38)	(-0.33)
Number of adult males	-0.096	-0.109	0.013	-0.073	-0.084	0.011
	(-9.12)	(-7.34)	(0.70)	(-7.62)	(-6.03)	(0.66)
Number of adult females	-0.007	0.011	-0.018	-0.016	0.015	-0.031
	(-0.60)	(0.72)	(-0.90)	(-1.50)	(1.00)	(-1.76)
Proportion of male15-59	0.044	-0.071	0.012	0.033	-0.036	0.069
	(0.73)	(-0.91)	(1.13)	(0.61)	(-0.50)	(0.78)
Proportion of female15-59	-0.456	-0.719	0.263	-0.363	-0.541	0.178
	(-5.33)	(-6.58)	(1.84)	(-4.66)	(-5.36)	(1.42)
Proportion of female>=60	-0.395	-0.724	0.329	-0.351	-0.549	0.198
	(-4.41)	(-6.10)	(2.15)	(-4.32)	(-5.01)	(1.48)
Age of head	0.002	-0.000	0.003	0.003	-0.001	0.004
	(0.82)	(-0.14)	(0.59)	(1.39)	(-0.27)	(1.00)
Age of head squared/100	0.000	0.003	-0.003	-0.002	0.003	-0.005
Maximum education	(0.13)	(0.80)	(-0.55)	(-0.65)	(0.86)	(-1.25)
Literate, not completed prim	0.095	0.083	0.013	0.051	0.030	0.021
	(4.82)	(3.98)	(0.44)	(2.72)	(1.55)	(0.81)
Primary completed	0.167	0.144	0.023	0.107	0.045	0.062
	(8.78)	(6.40)	(0.76)	(5.83)	(2.09)	(2.30)
Middle completed	0.290	0.214	0.076	0.192	0.111	0.081
	(15.73)	(8.83)	(2.43)	(10.58)	(4.75)	(2.88)
Secondary completed	0.479	0.396	0.083	0.349	0.226	0.123
	(25.83)	(13.97)	(2.38)	(18.80)	(8.10)	(3.90)
Univ. completed & above	0.661	0.605	0.056	0.505	0.372	0.133
	(27.33)	(13.64)	(1.07)	(21.35)	(8.13)	(2.84)
Per capita land owned (ha)	0.157	0.273	-0.116	0.188	0.347	-0.159
	(17.21)	(10.57)	(-4.02)	(20.60)	(13.77)	(-5.98)
Per capita land owned squared	-0.005	-0.029	0.024	-0.006	-0.038	0.032
	(-9.89)	(-5.92)	(4.60)	(-12.01)	(-8.37)	(6.67)
Proportion of irrigated land	0.140	0.160	-0.021	0.084	-0.038	0.122
	(9.21)	(6.87)	(-0.72)	(4.59)	(-1.23)	(4.55)
Possess milch animals	0.051	0.036	0.015	0.051	0.023	0.028
	(3.77)	(2.28)	(0.71)	(3.70)	(1.41)	(1.45)
Possess draught animal	-0.097	-0.122	0.025	0.009	-0.010	0.019
	(-7.15)	(-7.49)	(1.15)	(0.66)	(-0.57)	(0.96)
Constant	5.643	5.766	-0.122	5.601	5.653	-0.052
	(69.87)	(60.05)	(-0.95)	(76.00)	(64.21)	(-0.46)
Number of observations	6736	3772	10508	6736	3772	10508
Number of villages	1217	1217	1217	1217	1217	1217
R squared	0.238	0.183	0.273	0.219	0.135	0.251
F-statistics	117.80	47.80	107.36	100.97	29.53	101.02
			12.22			10.94

Note: The numbers in parentheses are t-statistics.

Appendix Table 2-8 Determinants of Living Standards with Occupation Dummies, 1983

	Without village		With village	
	Majority	SC	Majority	SC
Professional/managerial	0.269	0.274	0.247	0.255
	(14.21)	(5.32)	(13.32)	(4.92)
Clerical	0.250	0.315	0.234	0.283
	(10.76)	(5.76)	(10.23)	(5.22)
Sales/service	0.062	0.095	0.055	0.069
	(3.84)	(2.52)	(3.42)	(1.82)
Agricultural laborer	-0.141	-0.044	-0.140	-0.052
	(-9.69)	(-1.33)	(-9.81)	(-1.59)
Cultivator	0.058	0.090	0.059	0.061
	(4.07)	(2.59)	(4.19)	(1.76)
Other agriculture	0.126	0.114	0.093	0.069
	(7.37)	(2.92)	(5.45)	(1.75)
Production/non-farm laborers	0.060	0.172	0.047	0.125
	(3.91)	(4.97)	(3.12)	(3.64)
Female headed household	0.153	0.117	0.143	0.102
	(14.65)	(5.40)	(13.89)	(4.65)
Number of adult males	-0.061	-0.048	-0.058	-0.049
	(-14.36)	(-4.92)	(-13.81)	(-4.98)
Number of adult females	-0.020	-0.026	-0.024	-0.027
	(-4.43)	(-2.50)	(-5.32)	(-2.54)
Proportion of male15-59	0.015	0.030	0.011	0.056
(over adults)	(0.67)	(0.67)	(0.49)	(1.27)
Proportion of female15-59	-0.443	-0.307	-0.432	-0.256
	(-14.17)	(-4.74)	(-14.08)	(-3.96)
Proportion of female>=60	-0.392	-0.361	-0.378	-0.339
	(-11.89)	(-5.27)	(-11.71)	(-4.96)
Age of head	-0.004	-0.009	-0.004	-0.010
	(-4.51)	(-4.70)	(-4.14)	(-5.20)
Age of head squared/100	0.005	0.011	0.005	0.013
Maximum education	(5.06)	(4.94)	(4.58)	(5.61)
Literate but not completed primary	0.049	0.019	0.038	0.020
	(6.48)	(6.62)	(5.06)	(1.45)
Primary completed	0.130	0.091	0.119	0.070
	(19.02)	(6.62)	(17.52)	(4.96)
Middle completed	0.182	0.148	0.170	0.140
	(24.06)	(8.57)	(22.50)	(7.96)
Secondary completed	0.335	0.266	0.318	0.250
	(37.03)	(10.48)	(35.23)	(9.68)
University completed and above	0.382	0.170	0.380	0.140
	(27.45)	(4.41)	(27.44)	(3.51)

continued

Appendix Table 2-8, Cont.

	Majority	SC	Majority	SC
Per capita land owned (ha)	0.097	0.157	0.098	0.169
	(41.89)	(12.78)	(42.06)	(13.37)
Per capita land owned squared	-0.002	-0.010	-0.002	-0.011
	(-23.09)	(-6.96)	(-22.86)	(-7.47)
Proportion of irrigated land	0.101	0.050	0.095	0.035
	(16.07)	(3.92)	(14.42)	(2.56)
constant	5.732	5.625	5.736	5.629
	(181.35)	(89.79)	(185.78)	(90.51)
Number of observations	48262	13302	48262	13302
Number of villages	1903	1626	1903	1626
R squared	0.173	0.092	0.173	0.092
F-statistics	440.03	59.23	424.13	49.30

Note: The numbers in parentheses are t-statistics.

Appendix Table 2-9 Determinants of Living Standards with Occupation Dummies, 1987

	Without village		With village	
	Majority	SC	Majority	SC
Professional/managerial	0.212	0.317	0.200	0.254
	(14.58)	(9.14)	(15.06)	(7.22)
Clerical	0.189	0.266	0.132	0.250
	(10.35)	(6.93)	(7.97)	(6.48)
Sales/service	0.017	0.085	-0.011	0.077
	(1.32)	(3.12)	(-0.95)	(2.73)
Agricultural laborer	-0.217	-0.084	-0.203	-0.069
	(-19.12)	(-3.82)	(-19.14)	(-3.02)
Cultivator	-0.039	0.068	0.001	0.073
	(-3.57)	(2.86)	(0.05)	(2.96)
Other agriculture	-0.001	0.055	-0.030	-0.033
	(-0.07)	(1.64)	(-2.00)	(-0.93)
Production/non-farm laborers	-0.027	0.069	-0.065	0.033
	(-2.24)	(2.92)	(-5.79)	(1.32)
Female headed household	0.113	0.126	0.076	0.094
	(11.76)	(6.97)	(8.77)	(5.14)
Number of adult males	-0.074	-0.075	-0.063	-0.069
	(-19.78)	(-9.30)	(-18.80)	(-8.56)
Number of adult females	-0.022	-0.028	-0.025	-0.012
	(-5.44)	(-3.13)	(-6.85)	(-1.30)
Proportion of male15-59	-0.015	-0.002	-0.029	0.018
(over adults)	(-0.72)	(-0.05)	(-1.53)	(0.47)
Proportion of female15-59	-0.443	-0.477	-0.399	-0.412
	(-14.89)	(-8.57)	(-15.04)	(-7.46)
Proportion of female>=60	-0.391	-0.494	-0.387	-0.447
	(-12.37)	(-8.31)	(-13.76)	(-7.59)
Age of head	-0.001	-0.004	-0.000	-0.003
	(-0.89)	(-2.18)	(-0.38)	(-1.85)
Age of head squared/100	0.003	0.005	0.002	0.004
Maximum education	(2.59)	(2.59)	(1.71)	(2.18)
Literate, not completed primary	0.034	-0.003	-0.013	-0.032
	(4.65)	(-0.24)	(-1.89)	(-2.71)
Primary completed	0.116	0.086	0.041	0.010
	(16.28)	(7.51)	(6.28)	(0.81)
Middle completed	0.193	0.126	0.119	0.072
	(27.27)	(9.70)	(17.28)	(5.20)
Secondary completed	0.345	0.251	0.247	0.182
	(45.54)	(15.20)	(33.00)	(10.50)
Univ. completed & above	0.521	0.321	0.417	0.270
	(47.18)	(10.40)	(39.79)	(8.78)

continued

Appendix Table 2-9, Cont.

Per capita land owned (ha)	0.193	0.260	0.206	0.369
	(53.55)	(12.26)	(57.88)	(15.24)
Per capita land owned squared	-0.005	-0.024	-0.005	-0.043
	(-29.39)	(-5.06)	(-33.85)	(-8.85)
Proportion of irrigated land	0.077	-0.021	0.073	0.024
	(13.93)	(-1.98)	(10.57)	(1.68)
Constant	5.839	5.797	5.859	5.730
	(199.07)	(109.42)	(222.46)	(108.05)
Number of observations	51216	13243	51216	13243
Number of villages	6733	4271	6733	4271
R squared	0.227	0.135	0.219	0.124
F-statistics	653.77	90.99	661.57	69.26

Note: The numbers in parentheses are t-statistics.

Appendix Table 2-10 Multinomial Logit Regression for Non-SC Households, 1983

	Occupation category					
	Professional managerial	Clerical	Sales Service	Cultivator	Other agriculture	Production worker
Female headed household	-0.120	-0.539	-0.156	-0.148	0.675	-0.343
	(-0.98)	(-2.76)	(-1.76)	(-2.32)	(7.79)	(-4.34)
Number of adult males	-0.372	-0.446	-0.078	0.208	-0.146	-0.059
	(-7.15)	(-6.32)	(-1.95)	(7.16)	(-3.34)	(-1.67)
Number of adult females	-0.085	0.083	-0.025	0.134	0.225	0.112
	(-1.47)	(1.03)	(-0.57)	(4.42)	(5.05)	(2.99)
Proportion of male15-59	-0.731	-0.096	-0.501	-0.617	-0.617	-0.023
(over adults)	(-2.32)	(-0.19)	(-2.37)	(-4.09)	(-2.76)	(-0.12)
Proportion of female15-59	-1.728	-1.890	-0.867	0.333	-1.636	-0.511
	(-4.15)	(-2.98)	(-2.99)	(1.55)	(-5.36)	(-1.92)
Proportion of female>=60	-0.512	-1.157	-0.002	0.350	-1.565	-0.201
	(-1.12)	(-1.58)	(-0.01)	(1.53)	(-4.71)	(-0.69)
Age of head	0.146	0.108	0.037	0.018	0.019	0.002
	(9.89)	(5.29)	(3.97)	(2.80)	(1.89)	(0.32)
Age of head squared/100	-0.001	-0.120	-0.036	-0.012	-0.011	-0.007
HH head's education	(-9.04)	(-5.11)	(-3.56)	(-1.79)	(-0.99)	(-0.79)
Literate not complete prim	0.384	0.124	0.711	0.377	0.676	0.629
	(4.02)	(0.84)	(13.17)	(9.22)	(11.13)	(13.51)
Primary completed	1.503	1.884	1.087	0.620	0.635	0.930
	(12.85)	(11.48)	(20.29)	(15.98)	(9.98)	(20.68)
Middle completed	2.941	3.308	1.734	1.098	1.298	1.313
	(27.23)	(21.77)	(27.46)	(22.32)	(18.09)	(22.04)
Secondary completed	5.343	5.376	2.509	1.732	2.013	1.934
	(45.32)	(34.58)	(26.61)	(21.37)	(19.31)	(21.46)
Univ. completed & above	5.673	5.176	2.021	1.342	1.920	1.050
	(38.04)	(26.61)	(13.01)	(10.42)	(11.74)	(6.45)
Per capita land owned	1.626	1.246	-0.260	2.628	1.665	-0.462
	(25.15)	(13.14)	(-3.18)	(58.38)	(29.30)	(-6.39)
Proportion of irrigated land	-0.311	0.018	0.023	1.755	-0.686	0.140
	(-3.41)	(0.15)	(0.35)	(45.47)	(-7.99)	(2.57)
Muslim household	0.168	-0.145	0.335	-0.043	-0.236	0.265
	(1.83)	(-1.05)	(6.21)	(-1.02)	(-3.19)	(5.77)
Constant	-5.817	-5.738	-1.894	-2.122	-1.999	-0.939
	(-14.31)	(-9.90)	(-7.06)	(-10.90)	(-6.67)	(-3.97)
Number of observations	48262					
Log likelihood	-57739					
Pseudo R squared	0.234					

Note: Comparison group is Agricultural laborer. The numbers in the parentheses are t-statistics.

Appendix Table 2-11 Multinomial Logit Regression for Non-SC Households, 1987

	Occupation category					
	Professional managerial	Clerical	Sales Service	Cultivator	Other agriculture	Production worker
Female headed household	0.122	-0.036	-0.008	0.043	-0.403	-0.057
	(-1.10)	(-0.23)	(-0.09)	(0.65)	(-2.96)	(-0.72)
Number of adult males	-0.377	-0.449	-0.062	0.178	-0.017	-0.046
	(-8.11)	(-7.37)	(-1.63)	(6.14)	(-0.35)	(-1.36)
Number of adult females	-0.080	0.063	0.054	0.150	0.146	0.134
	(-1.59)	(0.94)	(1.29)	(4.93)	(2.66)	(3.63)
Proportion of male15-59	-0.210	0.026	-0.534	-1.015	-0.557	-0.139
(over adults)	(-0.67)	(0.06)	(-2.46)	(-6.48)	(-2.07)	(-0.70)
Proportion of female15-59	-0.907	-1.587	-1.221	-0.333	-0.899	-1.019
	(-2.19)	(-2.72)	(-4.09)	(-1.51)	(-2.31)	(-3.81)
Proportion of female>=60	0.139	-0.384	-0.593	-0.136	-1.188	-0.892
	(0.31)	(-0.59)	(-1.84)	(-0.58)	(-2.71)	(-3.03)
Age of head	0.109	0.100	0.027	0.006	0.012	-0.007
	(7.96)	(5.31)	(2.80)	(0.83)	(0.95)	(-0.90)
Age of head squared/100	-0.001	-0.001	-0.019	0.002	0.001	0.006
HH head's education	(-6.89)	(-4.81)	(-1.80)	(0.31)	(0.04)	(0.62)
Literate not completed prim	1.055	1.344	0.959	0.433	0.460	0.620
	(16.28)	(14.35)	(18.84)	(11.67)	(6.97)	(14.14)
Primary completed	0.792	1.000	0.448	0.565	0.062	0.440
	(6.56)	(5.47)	(7.42)	(13.69)	(0.78)	(8.89)
Middle completed	1.921	2.282	0.983	0.951	0.461	0.722
	(17.26)	(13.80)	(15.12)	(19.95)	(5.35)	(12.69)
Secondary completed	4.112	4.219	1.709	1.505	1.135	1.203
	(37.10)	(25.90)	(21.02)	(22.99)	(11.00)	(15.89)
Univ. completed & above	6.436	6.162	2.575	2.303	2.157	1.582
	(37.24)	(28.96)	(14.84)	(15.00)	(11.20)	(8.91)
Per capita land owned	2.846	1.611	0.340	4.217	2.993	1.146
	(26.62)	(9.48)	(2.51)	(48.96)	(27.34)	(10.59)
Proportion of irrigated land	-0.021	0.171	0.046	1.734	-0.386	-0.226
	(-0.29)	(1.81)	(0.78)	(46.08)	(-4.64)	(-4.25)
Muslim household	0.351	-0.170	0.489	0.035	-0.298	0.293
	(4.28)	(-1.31)	(9.11)	(0.82)	(-3.31)	(6.23)
Constant	-5.773	-6.139	-1.877	-1.355	-2.356	-0.523
	(-14.63)	(-11.29)	(-6.83)	(-6.75)	(-6.53)	(-2.19)
Number of observations	51216					
Log likelihood	-63848					
Pseudo R squared	0.210					

Note: Comparison group is Agricultural laborer. The numbers in the parentheses are t-statistics.

CHAPTER IV

CONCLUSIONS

The major objective of this study was to quantify the wage inequality in the urban areas and the welfare disparities across social groups in rural areas, and to investigate the source of these inequalities in India. In Essay 1, we found the increase in wage inequality among male workers in urban India over the past two decades. Different from the findings on consumption inequality which is found to increase in the 1990s but not in the 1980s, wage inequality started increasing even before 1991 when economic reform initiated. The increasing wage income inequality before 1993 was accounted for by the unequal distribution of observed skills, while the rise in wage inequality after 1993 was mainly due to increases in the premium on skills acquired from observed factors.

In all likelihood, accelerating skill premium is attributable to the increase in demand for skilled workers in the process of economic reform in India. Indeed, we found that the demand for skilled workers rose faster in more recent subperiod. Related with the economic reforms, our demand shift index calculated separately for the states with more or less active deregulation shows that regulatory environment seems to have some impact on labor demand, but not all the time. After 1993, the demand for skilled workers seems to increase in both groups of states with more and less deregulations. Further studies must examine why demand for skilled labor increased.

In Essay2, we found that SCs and STs continued to be deprived long after the Indian government had introduced its policy of affirmative action. The disparities of living standards between SCs/STs and majority households in rural India are not only because SCs and STs own lower human and physical capital than majority households, but also because these groups face significantly different models of income generation.

In the aggregate measure by Neumark decomposition method, half of the welfare disparities are accounted for by the different returns. We find that the differences in living standards between STs and the majority are largely due to the differences between villages where only poorer STs live and villages where only the majority or both the majority and STs reside. The results in this paper suggests, however, that targeting to these areas are not enough to reduce inequality between STs and the majority since STs earn lower returns than majority households even within given backward areas.

Even though the decomposition analysis cannot identify whether the different coefficients contributing the welfare disparities between SCs and the majority are totally due to "discrimination", our results show that SC households still have disadvantages to get well-paid jobs, which leads to lower per capita expenditure. Making labor market active as well as raising human and physical capital among SCs are crucial for reducing disparities of living standards between SC and other majority households in rural India.

It is considered that caste discrimination is less likely to be found in the city than in the village since caste differs from sex and race in that it is less readily

identified and, therefore, the caste system became less rigid owing to the greater anonymity and the diminishing correlation between occupational or economic stratification (Banerjee and Knight 1985). However, recent study by Munshi and Rosenzweig (2003) points out that caste-based occupation networks in urban labor market not only still exist in Mumbai, the largest business city in India, but also influence human capital investment among lower castes. These questions would remain for the future research.

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