

# Labor Regulations and Job Quality: Evidence from India

*Nidhiya Menon, Brandeis University*

*Yana van der Meulen Rodgers, Rutgers University*

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**Abstract.** This study examines whether measures of job quality in India’s manufacturing sector differ systematically across states with varying types of labor regulation. The analysis uses repeated cross sections of India’s NSSO household survey data from 1983 to 2004 merged with data on state-level regulations affecting employment adjustment and dispute resolution. Results show that restrictions on employment adjustment in a pro-worker direction result in substantially higher wages for all workers. Also, the probability of working full-time rises 1 percent for men and 10 percent for women. However, regulations increasing the cost of settling labor disputes contribute to lower wages for men and less job security for women, and regulations on employment adjustment increase the residual wage gap between men and women. We conclude that India’s employment protection legislation does have a silver lining when considering job quality, but that silver lining does not apply universally.

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Corresponding author: Yana Rodgers, Women’s and Gender Studies Department, Rutgers University, New Brunswick, NJ 08901. Tel 732-932-1151 x641, fax 732-932-1335, email yrodgers@rci.rutgers.edu. Contact information for Nidhiya Menon: Department of Economics & IBS, MS 021, Brandeis University, Waltham, MA 02454-9110. Tel 781-736-2230, fax 781-736-2269, email nmenon@brandeis.edu. The authors gratefully acknowledge Ahmad Ahsan and Carmen Pagés for sharing their data on state-level labor regulation.

## I. INTRODUCTION

Discussions of labor regulations often take place in a framework that highlights the cost of compliance. In such a framework, firms may hire fewer workers, substitute toward labor-saving technologies, and take on more casual home-based workers in an effort to reduce labor costs. Several studies have found empirical support for this argument, including Botero *et al.* (2004), which found that more highly regulated labor markets are associated with greater unemployment and more informal sector activity. Similarly, Amin (2009) found that retail stores in India responded to the cost of stricter labor laws by substituting away from workers to computers. In contrast, stronger rights for workers can have beneficial macroeconomic effects by enhancing labor market stability, which helps to foster domestic and foreign investment. Investment, in turn, spurs economic growth and the creation of new jobs in the formal sector (Stiglitz 2002; Rodrik 1999). These contrasting effects of regulations may be mediated by competitive pressures introduced through liberalization and globalization (Standing 1999). For example, even though developing country workers have gained new employment opportunities from increased integration with the global market, the jobs are often temporary, casual, flexible, and characterized by poor working conditions.

India constitutes an interesting case study in this debate on the costs and benefits of strong labor market regulations against a backdrop of market-oriented macroeconomic reforms. As a federal constitutional republic, India's labor market exhibits substantial variation across its twenty-eight geographical states in terms of the regulatory environment. Labor regulations have historically fallen under the purview of states, a system that has allowed state governments to decide whether to enact labor legislation that gives employers more flexibility (pro-business) or gives workers greater protection (pro-worker). Furthermore, starting in the early-1990s, India

underwent sweeping deregulation in trade and industry, mainly in response to external pressures that emanated from a balance of payments crisis.

The payments crisis and India's relatively slow economic growth in the preceding two decades had many roots, including the prevalence of an overly restrictive labor market regime. To test if such blame was justified, Besley and Burgess (2004) used detailed manufacturing-sector data for India from 1958 to 1992 and found that states which adopted relatively pro-worker industrial relations policies had lower output, productivity, investment, and employment in the formal sector. This conclusion has subsequently received mixed support. In a study supporting these results, Sanyal and Menon (2005) argued that pro-worker policies may manifest themselves in greater instances of labor turmoil. The authors found that states with a relatively high number of strikes, number of man-days lost in work-stoppages, and percentage of unionized workers experienced less domestic investment. Also finding negative effects, Hasan *et al.* (2003) used the Besley and Burgess measure of labor laws to analyze how labor market adjustments to trade liberalization varied across states. They found that states with restrictive labor regulations experienced smaller increases in labor demand elasticities following India's trade reforms compared to states with more flexible labor markets, implying that firms in the more restrictive states were at a competitive disadvantage in their ability to adjust their inputs in response to growing integration in world markets.

In contrast, Bhattacharjea (2006) characterized these earlier results as fragile, with the argument that the Besley and Burgess measure of pro-employer and pro-worker reforms did not clearly disentangle cross-state variations in labor regulations from differences in industrial relations and investment climates. What matters more, according to Bhattacharjea's critique, is the actual enforcement of labor laws and the judicial interpretation of India's Industrial Disputes

Act (IDA) of 1947. Our formulation of labor market regulations in this study takes Bhattacharjea's concerns into account.

In terms of the costs and benefits associated with labor laws and globalization, some have argued that women in particular have borne the burden of inadequate enforcement of labor standards as countries incorporate into a uniform global trading order. For example, Menon and Rodgers (2009) examined the impact of trade openness on India's gender wage gap in manufacturing and found that pressures to cut costs from international competition led to a reduction in women's relative pay. Lack of enforcement of labor standards appears to have left women with less bargaining power and limited wage gains compared to men. In the current study, we are careful to disaggregate results by gender in order to assess relative burdens.

Within this broader context, our objective is to study the association between labor regulations and job quality in India. The analysis adds to the debate on India's strict labor laws by examining whether measures of job quality differ systematically across states with variations in statutory laws that governed industrial and labor relations. The empirical work uses five waves of household survey data spanning the 1983-2004 period, merged together with data across states and over time on regulations affecting employment adjustment and labor disputes in India's manufacturing sector. As indicators of job quality, the analysis focuses specifically on wage levels, intensity of work activity (likelihood of working full-time), mode of payment (likelihood of being paid in cash only), job security, average skill requirements, and the residual gender wage gap. States that took a pro-employer stance in their amendments to labor regulations are expected to exhibit downward pressure on wages, lower rates of full-time work, and more precarious forms of payment and employment. In contrast, labor law amendments in a relatively

pro-worker direction are expected to have had positive effects on measures of job quality, despite pressures to the contrary from an increasingly competitive economic environment.

The results are consistent with these expectations. In particular, regulations associated with employment adjustment in a pro-worker direction have a positive impact on job quality as measured by wages and the probability of full time work, for both men and women. More specifically, a legislative amendment to any of the IDA's regulations on employment adjustment in a pro-worker direction contributes to a wage increase of 34 percent for men, and the probability that men work full-time increases by 1 percent. The corresponding magnitudes for women are a 32 percent wage increase and a 10 percent increase in the probability of full-time work. These estimates indicate that employment protection legislation can bring beneficial impacts to workers, especially in terms of wages and the availability of full-time work.

However, such benefits do not apply across the board. In particular, prolonging the length of dispute settlement depresses men's wages and reduces job security for women. More specifically, a labor law amendment that extends the duration of dispute resolution can reduce men's wages by 5 percent and lower the probability that a woman has a secure job by 8 percent. Moreover, firms appear to respond to regulations that impede employment adjustment by hiring workers with lower average skill levels. Finally, regulations that make it difficult for employers to adjust the size of their workforce contribute to a higher residual wage gap between men and women. Hence when employers face restrictions on modes of adjusting their workforce and settling labor disputes, workers gain some benefits in terms of job quality, but also bear some of the additional costs of the restrictions.

## **II. LABOR REGULATIONS AND THE BUSINESS ENVIRONMENT**

Like many developing countries in the post-WWII era, India based its economic development and trade policies on an import substitution strategy.<sup>1</sup> The country had some of the highest tariff rates and most restrictive non-tariff barriers in the region. Yet in 1990 and early 1991, a series of external, political, and macroeconomic shocks—including an oil price hike spurred by the Gulf War, a reduction in remittances from Indians employed in the Middle East, a shake-up in investor confidence following the assassination of Rajiv Gandhi, and growing fiscal and trade deficits—precipitated a financial crisis. The Indian government requested stand-by assistance from the International Monetary Fund in August 1991, and in return, agreed to what had become a fairly standard policy prescription of stabilization and structural adjustment policies. The government aimed to reduce tariff levels on a wide range of imported products, lower the variation across sectors in tariff rates, simplify the tariff structure, and remove many of the exemptions. Several new waves of reforms occurred in 1994 and 1997, with a slowdown in the pace of trade liberalization after 1997 as pressures from outside agencies subsided.

This period of economic liberalization followed several decades of statutory activity at the state level in interpreting and amending provisions of the 1947 IDA. These actions have been the topic of several empirical studies in the economics literature, with Ahsan and Pagés (2009) providing the most recent assessment of amendments, up through 1989, of state-level regulations on job security, labor disputes, and contract labor laws. The authors focused specifically on three regulatory categories: employment adjustment, dispute resolution, and a specific provision in the IDA known as Chapter 5b. The first category, labeled as “Adjustment”, measures the cumulative direction of changes in laws affecting firms’ employment adjustment capacity. This category relates primarily to laws that affect the ability of firms to hire and fire workers in response to changing business conditions. As explained in Ahsan and Pagés (2009), all amendments in each

year that strengthen workers' job security (and limit the ability of firms to adjust employment) are coded as +1. Such amendments include reductions in firms' ability to retrench, increases in the cost of making layoffs, and restrictions on firm closures. All amendments in each year that weaken workers' job security and strengthen the capacity of firms to adjust employment are coded as -1. Next, a state is assigned a 0 for each year in which there were no legislative changes affecting employment adjustment (neutral legislation). As the final step in the construction of the Adjustment variable and similar to the strategy in Ahsan and Pagés (2009), we added these values of +1, 0, and -1 over time to create a cumulative indicator of net amendments, up to and including each year of data in the analysis. This summation was implemented in order to construct a measure that would evaluate a state's overall exposure to a particular regulation *as of* each year.

The distribution across states of these net amendments over time in regulations affecting employers' ability to retrench is shown in Figure 1. One can readily see that the majority of states had no changes over time to regulations affecting the ability of firms to hire and fire workers. Of the seven states that did have such changes, all states made regulatory changes that favored workers rather than employers. Maharashtra and West Bengal in particular stand out for changing the regulatory environment to strengthen workers' job security and reduce the ability of firms to make employment adjustments.

### **Insert Figure 1 Here**

A similar procedure was followed to construct the second category of regulatory changes, labeled "Disputes." In particular, in each year, any state amendment that made it easier for workers to initiate and sustain an industrial dispute or that lengthened the resolution of industrial disputes was coded as +1. Conversely, any state amendment that limited the capacity of workers

to initiate and sustain an industrial dispute or that facilitated the resolution of industrial disputes was coded as -1. In years when there were no changes in laws related to procedures for resolving industrial disputes, states were assigned a 0. Again, as the final step in the construction of the Disputes variable, we added these values of +1, 0, and -1 over time to create a cumulative indicator of net changes to the laws on disputes, up to and including each year we analyze.

The distribution of these net changes over time across states in laws on procedures for the resolution of industrial disputes is shown in Figure 2. In contrast to trends in the Adjustment variable, regulatory changes over time to procedures for the resolution of disputes tended to favor employers and not workers, especially in Andhra Pradesh and Tamil Nadu. Four additional states also passed amendments on resolving industrial disputes that were in a pro-employer direction. Note that West Bengal, which stood out for having pro-worker regulatory changes affecting firms' employment adjustment capacity, also stands out for having pro-worker changes on procedures for resolving industrial disputes.

### **Insert Figure 2 Here**

The third category of regulatory actions, "Chapter 5b", captures the cumulative direction of amendments to Chapter 5b of the IDA. In sum, Chapter 5b prohibits firms that employ a certain threshold number of workers to fire them without permission from the state. In 1947, Chapter 5b applied to all firms with more than 300 workers. As of 1982, this threshold was reduced to firms with more than 100 workers. While this provision is one of many laws affecting firms' capacity to adjust the number of their employees (coded above as "Adjustment"), this particular provision has stood out over time as the most contentious. Any amendment that set a lower threshold for firms would be coded as +1, since the lower threshold would be pro-worker in the sense of widening the coverage to more firms who would be constrained in their ability to

fire workers at will. Similarly, raising the threshold would necessitate a coding of -1, reflecting a change in a pro-employer direction. Finally, each state is assigned a 0 for each year in which there were no legislative changes affecting the firm size threshold in state legislation relating to Chapter 5b. Again, as the final step in the construction of the “Chapter 5b” variable, we added these values of +1, 0, and -1 over time to create a cumulative indicator of the net directions of amendments, up to and including each year of the analysis. The results are depicted in Figure 3.

### **Insert Figure 3 Here**

One can readily see that five states had amendments in the pro-worker direction to Chapter 5b of the IDA. Each of these states set a lower firm size threshold for the application of Chapter 5b, thus preventing a larger population of firms from retrenching workers at will. For example, in 1981, the state of Maharashtra passed an amendment to Chapter 5b that extended the prohibition to fire workers without government permission from firms with 300 employees to firms with 100 employees.

Figures 1 – 3 have provided a graphical description of the regulatory climate in India. Placing India’s labor regulations into a broader context, fairly recent information on India’s overall business environment indicates that states with the best perceived business environment include Maharashtra, Gujarat, New Delhi, Tamil Nadu, and Karnataka (Table 1). This ranking of perceptions of business environments by state is based on the World Bank’s 2005 Enterprise Survey for India, which contains information on how the business environment is perceived by individual firms, and what firms see as the major impediments to performance.<sup>2</sup> The business environment includes various features related to the economic, financial, regulatory and investment climate. The high rankings for these states are consistent with results in Mitra *et al.* (2002), which found these states to be the most industrialized and also the best equipped in terms

of infrastructure. In contrast to the states with favorable business climates, the states with the worse business environments in Table 1 are Bihar, Orissa, West Bengal, Kerala, Jharkhand, and Uttar Pradesh, with Bihar having by far the largest proportion of negative responses. Note that in a set of consistency checks with additional questions in the survey, for states with the top five business environments, respondents overwhelmingly responded that these states had both a better general business environment and a better environment for their particular industry compared to the state in which they were located. In contrast, business owners overwhelmingly preferred their own state compared to the states with the worse business environments.

### **Insert Table 1 Here**

The World Bank data on business environments also indicate that the most important reason cited for locating an enterprise in a particular state was because the owners were from that state: 80 percent of business owners responded that a reason for locating their establishment in a particular state was that they were from that state. Another common reason was natural resources: slightly more than half of owners cited raw materials as an important reason for selecting a particular state. Favorable tax policies appeared to play a smaller role in attracting new enterprise: just 30 percent of owners said they chose a particular state for their enterprise location because the state gave concessions and benefits. Among those who found state concessions and benefits to be important, owners were dispersed geographically, with some concentration of owners in the cities of Kolkata (West Bengal) and Jaipur (Rajasthan). Both these states have relatively poor business environments, implying that authorities may have been trying to compensate by providing tax breaks.

### **III. METHODOLOGY AND DATA**

To measure the implications of labor regulation on indicators of job quality, the analysis uses an empirical specification adapted from Ahsan and Pagés (2009) that relates a set of job quality outcomes to worker characteristics and labor regulations across states over time. This specification assesses how job quality changed over time and across states with different regulatory environments while controlling for worker characteristics and state macroeconomic indicators.

We express the determinants of job quality for individual workers as follows:

$$y_{ijt} = a + bR_{jt} + cX_{ijt} + bS_{jt} + \mu_j + m_t + \vartheta_{ijt} \quad (1)$$

where  $i$  denotes an employee,  $j$  denotes a state, and  $t$  denotes time. The dependent variable  $y_{ijt}$  represents a job quality indicator for individual  $i$  in state  $j$  in year  $t$ . The notation  $R_{jt}$  is a set of variables representing the regulatory environment in the labor market across states and over time. The matrix  $S_{jt}$  represents a set of control variables for state-level indicators of public finance, including net state domestic product per capita, state total expenditures per capita, and state development expenditures (expenditures on health and education) per capita. The notation  $X_{ijt}$  is a set of individual and household characteristics that influences workers' wages and terms of employment. These characteristics include gender, education level attained, years of potential experience and its square, whether the worker has any technical education, marital status, low caste status, religion, household headship, rural versus urban residence, and the number of pre-school children in the household. Most of these variables, including the number of pre-school children, marital status, and household headship, are fairly standard control variables in wage regressions across countries. Specific to India, wages may be lower for individuals belonging to castes that are perceived as backward and for individuals who are not Hindu.<sup>3</sup> Finally,  $\mu_j$  is a state-specific effect that is common to all individuals in each state,  $m_t$  is a time-specific effect

that is common to all individuals in each year, and  $\vartheta_{ijt}$  is a worker-specific idiosyncratic error term.

Regressions are performed alternatively with repeated cross-section data at the worker level, and at the aggregate level with state averages over time. All regressions at the worker level are estimated separately for men and women. Models with continuous dependent variables (as is the case for log wages and all aggregated state-level measures) are estimated with Ordinary Least Squares, and models with a non-linear dependent variable (as is the case for indicators of full-time, works for cash only, and has a secure job) are estimated with logit regressions. The paper reports marginal effects of the logit coefficients. All regressions are weighted using sample weights provided in the NSSO data for the relevant years; the weights correct for the fact that the proportion of individuals and households in the sample for each year differs from the proportion in the true population. In addition, we report robust standard errors clustered at the state level.

To estimate the regressions, the study draws on five cross-sections of household survey data collected by the National Sample Survey Organization (NSSO) in India. The data include the years 1983 (38<sup>th</sup> round), 1987-1988 (43<sup>rd</sup> round), 1993-1994 (50<sup>th</sup> round), 1999-2000 (55<sup>th</sup> round), and 2004 (60<sup>th</sup> round). For each round, we utilize the Employment and Unemployment module - Household Schedule 10. These surveys have detailed information on wages; hours worked; intensity of work; form of remuneration; types of occupations; and other details on worker characteristics including age, education, gender, and ethnicity.

To construct the labor force sample, we retain all employees of prime working age (ages 15-60) with positive weekly total wages in the manufacturing sector and with measured values for all indicators in the empirical analysis, leaving us with 75,018 observations in the pooled sample. Indicators of job quality include real wage levels; intensity of work activity (as measured

by the likelihood of engaging in full-time work); mode of payment (whether payment is in cash); job security (as measured by the likelihood of a worker not needing to engage in subsidiary employment); wage inequality (as measured by residual gender wage gaps); and skill requirements (as measured by average educational qualifications of workers).<sup>4</sup> For the state-level regressions, all the variables in the labor force sample are aggregated to the state-level using state codes provided by the NSSO. This step entailed reconciling changes over time in NSSO state codes that arose, in part, from the creation of new states in India (such as the creation of Jharkhand from southern Bihar in 2000). Newly created states were combined with the original states from which they were created in order to maintain a consistent set of state codes across the years of analysis. In addition, consistent with previous studies on India that condition on state-level indicators, Union Territories were combined with the states to which they are closest geographically.

Sample statistics in Table 2 indicate that real weekly cash wages rose steadily during the 1983 to 2004 period, with the steepest rise between 1987 and 1993, and very little real wage growth from 1993 to 1999. Moreover, a very high percentage of workers in India's manufacturing sector were employed full-time throughout the period.<sup>5</sup> Similarly, the vast majority of employees work for cash only. Over time there was some variation in the percentage of workers having secure jobs and not needing to hold a subsidiary job, with an average over the period of about 88 percent. Table 2 further indicates that manufacturing sector workers are predominantly men, and they depict considerable variation in their educational attainment. For example, in 1983, 28 percent of workers were illiterate and 22 percent of workers had at least a secondary school education. By 2004, the percentage of illiterate workers had dropped to 22 percent, and the percentage of workers with at least secondary school had risen to 30 percent.

## Insert Table 2 Here

Among other indicators, the majority of the sample lived in urban areas, which is consistent with the fact that the sample covers just manufacturing sector workers. Finally, the bulk of the sample was married, had no technical education, lived in households headed by men, and claimed Hinduism as their religion. Interestingly, on average across the years, about one quarter of the workers belonged to the lowest tier of India's class system: the scheduled castes and scheduled tribes.

Merged into the panel data on worker characteristics is a separate database of public finance variables at the state level that serve as control variables. The variables cover 16 states for each of the five years for which we have NSSO data (1983, 1987, 1993, 1999, and 2004), and include net state domestic product per capita, state total expenditures per capita, and state development expenditures per capita. Development expenditures, in turn, are based on state health and education expenditures. These public finance variables are constructed from data in the Economic Organization and Public Policy Program's *Indian States Data Base*, which is available through the London School of Economics and Political Science (EOPP 2011).<sup>6</sup>

Finally, merged with the labor force panel dataset is information on labor regulations over time and across states from Ahsan and Pagés (2009). This data was used to construct the three variables on Adjustment, Disputes, and Chapter 5b, discussed in the previous section. We test for sensitivity of coefficients on the regulation variables by including them in alternative formulations in four models. Model 1 includes the Adjustment and the Disputes variables alone, plus all the other worker characteristics, public finance variables, state dummies, and year dummies. Model 2 replaces these two variables with the measure of cumulative amendments to Chapter 5b. Because Chapter 5b constitutes a subset of the regulations affecting employment

adjustment, the Adjustment and Chapter 5b variables would be collinear if included together in the same regression. Model 3 adds the Disputes variable to Model 2, plus the interaction term of the Disputes and Chapter 5b variables in order to reflect the idea that these two regulatory measures may reinforce each other. For example, a pro-worker amendment to Chapter 5b would strengthen job security and make it more difficult for firms to fire workers, thus potentially increasing the cost and duration of dispute settlement. Model 4 has a similar rationale as Model 3, with the inclusion of an interaction term for the compounded effects of the Adjustment and Disputes variables.

#### **IV. RESULTS**

Table 3 presents the regression results for the determinants of men's job quality in India's manufacturing sector. As additional controls not reported in the table, all regressions include state and year dummies, as well as state public finance variables. Note that the log wage results in the first column represent coefficient estimates and their standard errors from OLS regressions, while results in the other three columns represent marginal effects and their standard errors from logit regressions. The positive coefficients in the first row of the table indicate that regulations associated with employment adjustment that are in a pro-worker direction have a positive impact on job quality, as measured by wages and the probability of full time work. In particular, wages are 34 percent higher, and the probability that men work full-time increases by 1 percent for a unit increase in the Adjustment variable. Recall that a unit increase in one of the regulatory variables represents a legislative amendment that has a pro-worker tilt. The probability of working full-time also increases in response to labor law amendments that prolong the time it takes to settle disputes. That said, extending the time it takes to settle labor disputes has negative effects on men's wage levels and the probability of being compensated in cash only.

For a unit increase in the Disputes variable, the probability of receiving compensation in cash declines by 2 percent. Since cash is fungible, we consider this mode of compensation to be the preferred outcome. Hence the result for the Disputes variable reflects a change that is less welfare-enhancing for men. The result also suggests that employers pass on to workers the additional cost of resolving disputes by reducing wages, and perhaps, by substituting in-kind payments for cash payments. Neither of these labor amendments affects men's job security.

In terms of the other determinants of men's job quality, higher levels of schooling are associated with higher pay and greater job security. Strikingly, men with graduate school are 3 percent less likely to work full-time. Manufacturing sector work is likely to be blue-collar in nature; these results suggest that individuals with advanced levels of schooling are more likely to take on white-collar service sector positions. Moreover, completion of secondary school has significant positive effects on receiving compensation in cash, and men with secondary schooling are 9 percent more likely to hold a secure job.

Experience has the expected non-linear effect on wages, although this variable appears to matter only for that measure of job quality and not for the likelihood of engaging in full-time work, receiving cash compensation, or having a secure job. As expected, lack of technical education has strong negative impacts on wages and the probability of full-time work. Moreover, married men are more likely to earn higher wages and work on a full-time basis, whereas men belonging to the disadvantaged groups in India are 6 percent less likely to work full-time. Belonging to Hinduism has a positive impact on being compensated in cash, and workers in households headed by men are less likely to work full-time. Because households headed by men are likely to have a secure stream of income, it is possible that other workers in such households do not need full-time work attachment to supplement household earnings. Finally, job security is

about 16 percent lower in rural areas, and surprisingly for men, a greater number of pre-school children reduces the probability of having a secure job (one would expect this finding for women).

Table 4 reports coefficients on alternative specifications of the regulation measures for men. The positive and statistically significant impact of regulations affecting employment adjustment on men's wages in Model 1 is retained when including the interaction term in Model 4, while the latter is not statistically significant. The result implies that the positive impact on men's wages comes entirely through heightened job security rather than through compounded effects of dispute settlement. In contrast, the positive effect of the Adjustment variable on the probability of working full-time loses its statistical significance once the interaction with the Disputes variable is added to Model 4, implying that men's likelihood of working full-time has greater impetus from the cost to employers of having to go through the process of settling disputes. Amendments to Chapter 5b have a positive impact on all four measures of men's job quality: wages (Models 2 and 3), probability of working full-time (Model 3), probability of working for cash only (Model 2), and probability of having a secure job (Model 3). For instance, a unit increase in the Chapter 5b variable is associated with a 3 percent higher likelihood of full-time work and a 4 percent increase in the likelihood of having job security. Hence, while Chapter 5b may have caused more contention than other provisions of the IDA, the results suggest that such amendments improved job quality for workers in the manufacturing sector.

Table 5 presents results for the determinants of job quality for women workers. As before, all regressions include state and year dummies as well as state public finance variables, although these coefficients are not reported in the table. The positive coefficients on the Adjustment variable in the regressions for wages and for the indicators of full-time work and

holding a secure job indicate that regulations on employers' ability to adjust their workforce in a pro-worker direction have positive impacts on these job quality measures for women. More specifically, a unit increase in the Adjustment variable is associated with a 10 percent higher probability of full-time work, a 9 percent higher probability of holding a secure job, and a 32 percent increment in wages. These marginal effects for full-time work and job security are substantially higher than the effects reported for men. Further, unlike the effects for men, women's wage levels, the probability of working full-time, and the probability of being compensated in cash are unaffected by the Disputes variable. Alternately, prolonging the duration of dispute settlement does have a negative effect for women on job security – a unit increase in the Disputes variable reduces job security by 8 percent. Taken together with the finding that the Disputes variable has no impact on men's job security, the result suggests that when dispute settlement costs rise, women face a higher risk of losing their job security.

In terms of the other determinants of women's job quality, higher levels of schooling are associated with higher pay and somewhat greater job security. As in the case of men, women workers with higher levels of schooling are less likely to work full-time, although they would command substantially higher wages if they chose to do so. The coefficient in Table 5 indicates that women with graduate school are about 32 percent less likely to be employed full-time, and likely to earn wages that are over 100 percent higher as compared to women without any schooling.

Potential experience has the expected non-linear effect on women's wages, and unlike results for men, reduces the probability of women having full-time work and a secure job. In particular, an additional year of experience reduces the probability of full-time work by about 1 percent. Some of these results may reflect trends in intermittency and aging, as women of child-

bearing age and relatively older women workers are more likely to exit the labor market relative to men of comparable ages. Unlike the significant impacts of a lack of technical education for men, for women workers, technical education has no effect on wages or other measures of job quality. This finding might reflect the fact that on average, relatively few women workers received technical education in the years covered by the analysis. Surprisingly, married women workers are 13 percent more likely to work on a full-time basis, conditional on the number of pre-school children in the household. Households in India do not tend to be unitary in nature – thus, older relatives are likely to be present to provide assistance with childcare. Women belonging to the disadvantaged social groups in India are approximately 10 percent less likely to work full-time, and being Hindu has no impact on any measure of job quality. As expected, women workers in households headed by men are about 30 percent less likely to work full-time. Finally, in rural India, women workers are about 16 percent less likely to have secure jobs, a result similar in magnitude to that found for men. However, unlike men, women in the rural sector are more likely to be compensated in cash only compared to their urban counterparts.

Table 6 reports coefficients on alternative specifications of the regulation measures for women workers. The positive and statistically significant impact of the Adjustment variable on women's wages in Model 1 is retained when its interaction with the Disputes variable is included in Model 4. Hence the reinforcing aspects of adjustment regulations and dispute regulations in a pro-worker direction have an additional positive impact on women's wages. That said, increases in the cost of resolving disputes in Model 4 have a negative effect on women's pay, which could reflect the attempt of firms to pass along the greater costs of dispute settlement to women in the form of lower wages. Moreover, amendments to Chapter 5b that favor workers contribute to higher wages (Models 2 and 3), with a positive reinforcing effect from the interaction term

(Model 3). The marginal effects for the Chapter 5b variable in the top panel of Table 6 are similar in sign, but somewhat larger in magnitude, as compared to the effects for men in Table 4.

In terms of the probability of full-time work, echoing the results for men, the positive effect of the Adjustment variable loses its statistical significance once the interaction with the Disputes variable is added to the model (Model 4). Hence the process of resolving disputes has a larger effect on women's likelihood of working full-time. The impact of adjustment regulations on the probability of full-time work in Model 1 is similar in sign and magnitude to the impacts in terms of job security (Models 1 and 4). Interestingly, increases in the Disputes variable result in an approximately 5 percent higher probability of compensation in cash only (Model 3) and a 16 percent lower probability of holding a secure job (Model 3 and 4) for women workers. This effect on cash remuneration is absent for men, indicating that women workers bear a larger share of the burden associated with regulations affecting dispute resolution. Finally, similar to the results for men, amendments to Chapter 5b have a positive impact on women's wages, the probability of full-time work, probability of being compensated in cash, and job security. As in the case of men, these results indicate that amendments to Chapter 5b in a pro-worker direction were beneficial for women workers employed in manufacturing.

The presence of labor regulation also has implications for the average skill levels of workers employed in the regulated sectors. Table 7 explores this assumption using state-level averages of variables that measure men's average skills. The first panel of Table 7 reports results for the case where average skills are measured more broadly using an indicator for whether the worker has some schooling (as compared to no schooling). The second panel focuses on a more exclusively defined category of skilled workers – men with secondary or higher education (as compared to men with less or no schooling). The negative and significant coefficient on the

Adjustment variable in Model 1 of the top panel indicates that regulations that impede employment adjustment reduce the average measure that workers are literate. In particular, for a one unit increase in the Adjustment variable, the state average measure of worker literacy drops by 4 percent. This result is consistent with the estimate in Model 4, which includes the interaction term with the Disputes variable. The interaction terms in Model 4 is insignificant, implying that most if not all of the negative effect on average skills is coming from restrictions on employment adjustment. Models 2 and 3 show similar estimates for Chapter 5b regulatory changes – that is, regulations that impede employment adjustment reduce the average measure of worker literacy. A significant effect for the Disputes variable is found only in Model 4 – the sign on this coefficient indicates that increasing costs of settling labor disputes contributes to the employment of men with lower average skill levels.

In comparison to the top panel, many of the effects of regulations in the bottom panel of Table 7 are measured with error. The negative and significant impact of the interaction term in Model 3 suggests that regulations that curtail employment adjustment may compound the impact on average skills of dispute resolution regulations. This result is also found in Model 4 where the interaction term is of similar sign but of smaller magnitude. Taken together, the results in Table 7 indicate some impact of the adjustment and disputes regulations on men’s average skill levels, particularly if average skill levels are defined more broadly. These results still hold when average skill levels are defined more exclusively, but the estimates have less precision.

Table 8 reports corresponding results on state-level averages of skill levels for women workers. The negative and significant coefficient on the Adjustment variable in Model 1 of the top panel is similar in sign but of larger magnitude as compared to the effect for men, and indicates that regulations that impede employment adjustment reduce the average likelihood that

workers are literate by about 6 percent. Again, this result is consistent with the estimate in Model 4, which includes the interaction term with the Disputes variable. Models 2 and 3 also report negative and significant estimates for Chapter 5b regulatory changes. A significant effect for the Disputes variable is found in Model 1, Model 3, and Model 4 – the positive sign on this coefficient across the models indicates that increasing costs of settling labor disputes contributes to the employment of fewer uneducated women workers. This finding contrasts with the impact of the Disputes variable for men in Table 7 – the estimate in Model 4 in particular suggests that the increasing cost of settling labor disputes is associated with the employment of a higher proportion of literate women but a lower proportion of literate men.

The bottom panel of Table 8 shows results for highly educated women workers. As in the case of highly educated men, many of the estimates are measured imprecisely. Of the two terms that are significant, the negative and significant impact of the interaction term in Model 3 indicates that regulations that limit dispute resolution may amplify the negative impact of employment adjustment regulation on the average skill levels of women workers (similar to its impact for men). This result is underlined in Model 4 where the interaction term is in the same direction but of lower size. Consistent with the results on the average skills of men, Table 8 indicates some impact of the adjustment and disputes regulations on average skill levels of women workers, especially when skills are defined more broadly. This regulatory impact is only weakly evident when average skill levels are defined more exclusively.

The final test considers the impact of labor regulations on the residual wage gap between men and women, with results reported in Table 9. The residual wage gap is estimated using the Oaxaca-Blinder decomposition procedure, a technique that decomposes the wage gap in a particular year into a portion explained by average group differences in productivity

characteristics and a residual portion that is commonly attributed to discrimination (Oaxaca 1973; Blinder 1973). Results in Table 9 for the Adjustment variable in Models 1 and 4 indicate that amending adjustment regulations in a pro-worker direction widens the residual wage gap between men and women. This widening in the residual gap is broadly consistent with the differential impact of the Adjustment variable on log wages in Table 3 for men and Table 5 for women. The same conclusion applies when changes in adjustment regulations are measured specifically by amendments to Chapter 5b (Models 2 and 3). The significance and sign of the interaction term in Model 3 indicates that most of the effect on the unexplained portion of the wage gap is coming from Chapter 5b amendments (as opposed to the Disputes variable, which is insignificant). Hence, these results indicate that regulations restricting employers in their ability to adjust the workforce may lead to wage discrimination against women. When employers face employment protection legislation, they compensate for the additional cost by remunerating women workers relatively less.

The regression results discussed above indicate that India's IDA regulations pertaining to employment adjustment and dispute resolution have substantial effects on job quality. In particular, real wages, the probability of having a full-time work, the likelihood of being compensated solely in cash, and job security are each responsive to state-level labor laws. Moreover, these responses differ along gender lines, and the direction of causality underlying the results is from labor regulations to the job quality measures. Reverse causality is absent because state governments have passed no amendments to the IDA since 1989. Given that most of the data in this study were collected after that year, the direction of causality is plausibly from regulations to the job quality measures.

## V. CONCLUSION

This study has examined the extent to which India's regulatory environment in the labor market affects various measures of job quality across states. Results confirm that measures of job quality are indeed sensitive to state-level statutory laws that govern industrial and labor relations in India's manufacturing sector. Labor law amendments affecting employment adjustment, dispute settlement, and Chapter 5b of the IDA have substantial impacts on wages, probabilities of full-time work, probabilities of being compensated in cash, and job security. In particular, restrictions on employment adjustment in a pro-worker direction result in substantially higher wages for men and women, and they contribute to increases in full-time work probabilities of 1 percent for men and 10 percent for women. The most contentious of all labor regulations, Chapter 5b, has beneficial effects on all four measures of job security when law-makers legislate in a pro-worker direction, with women workers benefitting relatively more. For example, whereas Chapter 5b regulation increases job security by about 4 percent for men, the corresponding estimate for women is over six times larger. Although previous researchers argue that this particular provision of the IDA reduced investment, employment, and output, our results highlight its benefit to workers.

Other gender-disaggregated results indicate that regulations on workforce adjustment and disputes do not have uniform impacts. For example, alternative specifications of the regulation variables indicate that prolonging the duration of settling labor disputes has a negative impact for women in terms of pay and job security, but not for men. This finding suggests that the security and remuneration of women's jobs are most at risk when the costs of dispute settlement rise. Moreover, regulations that curtailed employment adjustment can lead to a widening in the residual gender wage gap, a commonly-used measure of wage discrimination against women. Hence, in some instances, amendments in a pro-worker direction can be less welfare-enhancing

for women as compared to men. It is not surprising that Freeman (2009)'s review concluded that India's labor institutions did more harm than good. Our results, which provide a valuable update on earlier studies, indicate that employment protection legislation does have a silver lining when considering job quality, but that silver lining does not apply universally.

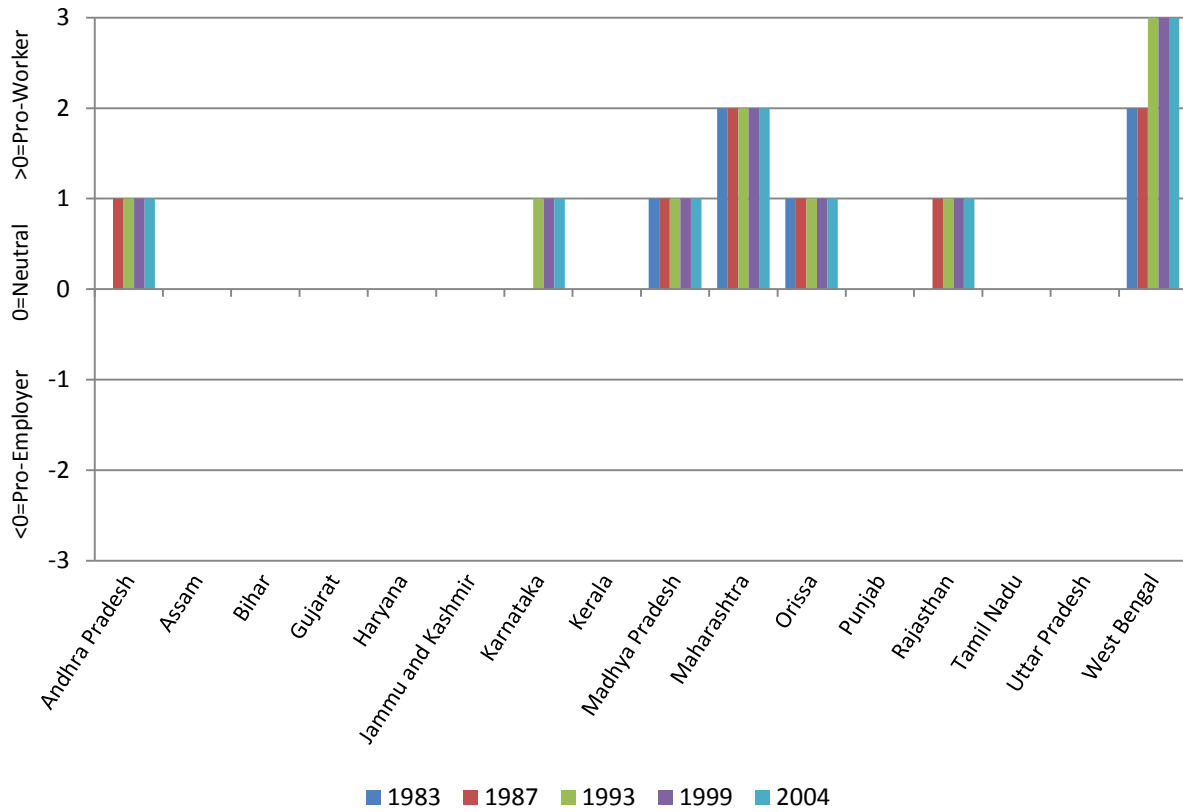
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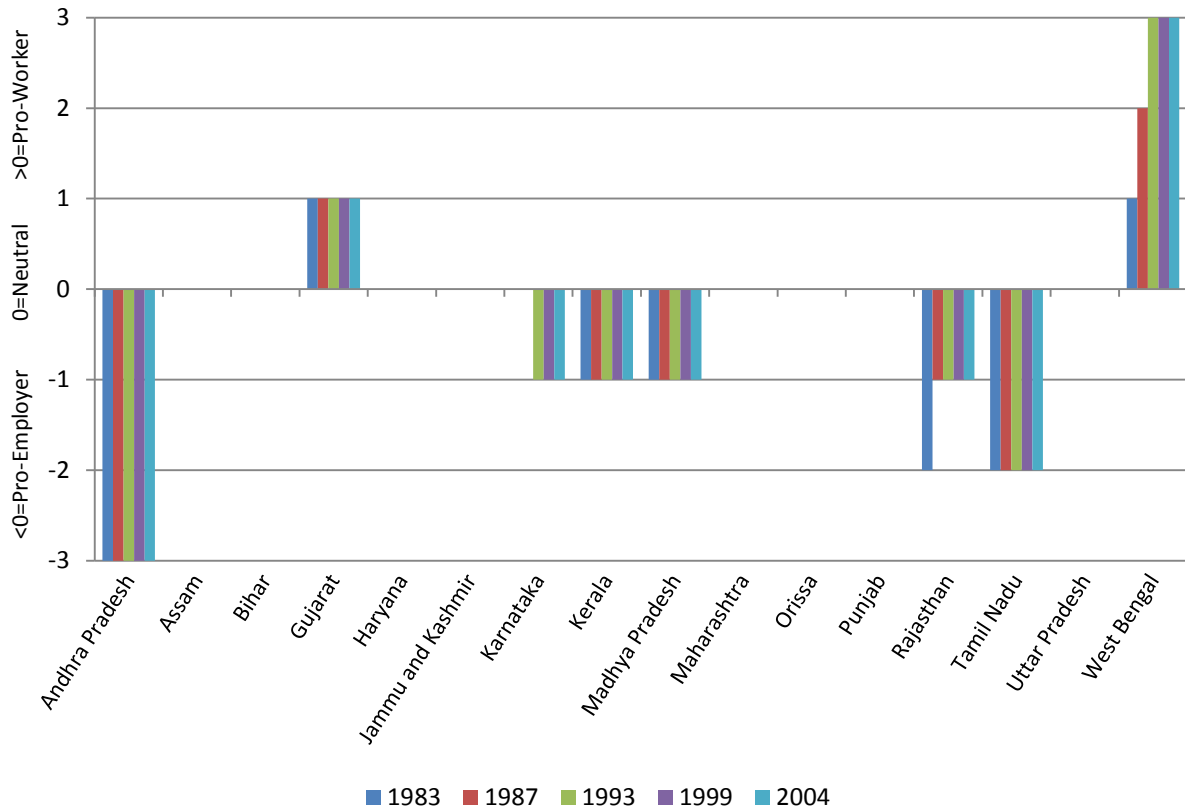
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**Figure 1.** Changes in Laws Affecting Firms' Employment Adjustment Capacity, 1983-2004



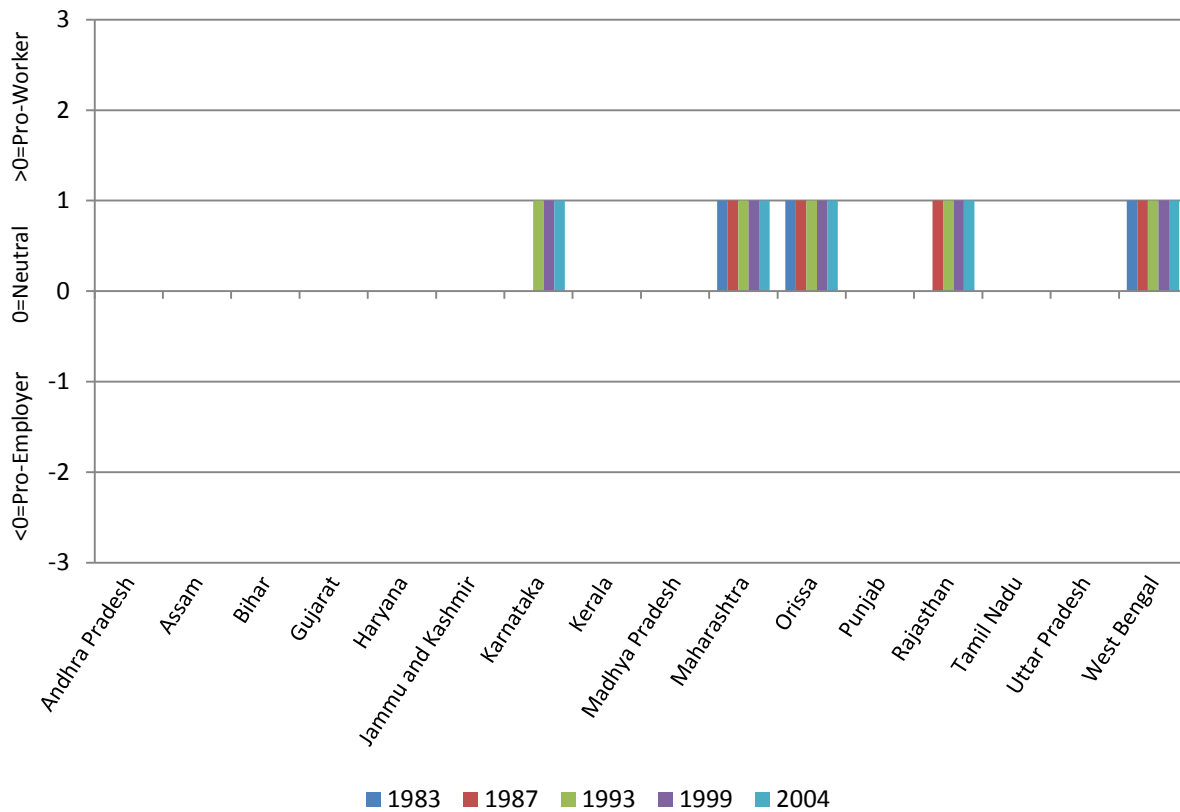
**Source:** Authors calculations using data on state regulations from Ahsan and Pagés (2009).

**Figure 2.** Changes in Laws on Procedures for Resolution of Industrial Disputes, 1983-2004



**Source:** Authors calculations using data on state regulations from Ahsan and Pagés (2009).

**Figure 3.** Amendments to Chapter 5b of the Industrial Disputes Act, 1983-2004



**Source:** Authors calculations using data on state regulations from Ahsan and Pagés (2009).

**Table 1.** Best and Worst Business Environments in India by State, 2005

<i>Best Environment</i>	<i>% of Firm Responses</i>	<i>Worst Environment</i>	<i>% of Firm Responses</i>
Maharashtra	23.7	Bihar	65.0
Gujarat	22.7	Orissa	7.4
New Delhi	13.0	West Bengal	6.9
Tamil Nadu	8.3	Kerala	5.9
Karnataka	4.7	Jharkhand	3.7
Andhra Pradesh	3.5	Uttar Pradesh	3.2
Haryana	3.5	Rajasthan	1.5
Punjab	3.4	Punjab	0.9
Jharkhand	3.1	New Delhi	0.8
Uttar Pradesh	2.8	Andhra Pradesh	0.8
West Bengal	2.3	Haryana	0.7
Kerala	2.3	Tamil Nadu	0.7
Rajasthan	1.9	Madhya Pradesh	0.7
Madhya Pradesh	1.9	Gujarat	0.6
Orissa	1.5	Maharashtra	0.5
Bihar	0.4	Assam	0.2
Chhattisgarh	0.4	Karnataka	0.2
Uttaranchal	0.2	Chhattisgarh	0.1
Himachal Pradesh	0.1	Himachal Pradesh	0.1
Pondicherry	0.1	Jammu and Kashmir	0.1
Goa	0.1		
Assam	0.1		
Meghalaya	0.1		

**Source:** World Bank (2005).

**Table 2.** Individual and Household Characteristics for Manufacturing Sector Paid Employees

	<i>1983</i>	<i>1987</i>	<i>1993</i>	<i>1999</i>	<i>2004</i>
Log real weekly cash wages in rupees	3.824 (1.200)	4.027 (1.131)	4.375 (1.035)	4.380 (0.990)	4.528 (0.929)
Works full-time	0.921 (0.270)	0.908 (0.289)	0.973 (0.162)	0.847 (0.360)	0.950 (0.217)
Works for cash only	0.959 (0.197)	0.961 (0.193)	0.950 (0.218)	0.931 (0.254)	0.860 (0.347)
Has secure job (no subsidiary job needed)	0.866 (0.340)	0.960 (0.197)	0.842 (0.365)	0.887 (0.316)	0.856 (0.351)
Male	0.842 (0.365)	0.845 (0.362)	0.812 (0.391)	0.853 (0.354)	0.828 (0.377)
Educational attainment					
Illiterate	0.276 (0.447)	0.222 (0.416)	0.265 (0.441)	0.188 (0.391)	0.223 (0.416)
Less than primary school	0.144 (0.351)	0.133 (0.340)	0.136 (0.342)	0.108 (0.311)	0.081 (0.272)
Primary school	0.198 (0.398)	0.196 (0.397)	0.165 (0.372)	0.145 (0.352)	0.168 (0.374)
Middle school	0.164 (0.370)	0.149 (0.356)	0.166 (0.372)	0.208 (0.406)	0.233 (0.423)
Secondary school	0.162 (0.369)	0.208 (0.406)	0.198 (0.399)	0.253 (0.435)	0.177 (0.382)
Graduate school	0.056 (0.229)	0.091 (0.288)	0.070 (0.256)	0.097 (0.296)	0.118 (0.322)
Potential experience in years	20.707 (12.106)	21.295 (12.168)	20.439 (12.066)	23.322 (13.237)	19.645 (11.933)
Potential experience squared/100	5.753 (6.105)	6.015 (6.129)	5.633 (5.927)	7.191 (6.891)	5.283 (5.722)
Age in years	32.141 (11.027)	33.661 (11.189)	32.389 (11.070)	36.492 (12.436)	32.458 (10.694)
No technical education	0.941 (0.237)	0.918 (0.274)	0.931 (0.254)	0.938 (0.241)	0.917 (0.277)
Currently married	0.705 (0.456)	0.734 (0.442)	0.708 (0.455)	0.674 (0.469)	0.700 (0.458)
Scheduled tribe/scheduled caste	0.181 (0.385)	0.156 (0.363)	0.206 (0.405)	0.387 (0.487)	0.230 (0.421)
Hindu	0.818 (0.386)	0.824 (0.381)	0.837 (0.369)	0.852 (0.355)	0.846 (0.361)
Household headed by a man	0.933 (0.250)	0.938 (0.242)	0.918 (0.275)	0.970 (0.170)	0.918 (0.275)
Rural	0.336 (0.472)	0.146 (0.354)	0.427 (0.495)	0.419 (0.493)	0.458 (0.498)
No. of pre-school children in household	0.632 (0.863)	0.548 (0.821)	0.511 (0.778)	0.418 (0.733)	0.484 (0.782)
Sample size	17,223	14,071	24,646	12,919	6,159

**Note:** Standard deviations are in parentheses, and sample means are weighted. All means are expressed in percentage terms unless otherwise noted.

**Table 3.** Determinants of Job Quality in India's Manufacturing Sector for Men

	<i>Log Wages</i>	<i>Works Full-Time</i>	<i>Works for Cash Only</i>	<i>Has Secure Job</i>
Amendments to Labor Regulations:				
Adjustment	0.340*** (0.043)	0.014* (0.008)	0.011 (0.016)	0.003 (0.017)
Disputes	-0.053*** (0.018)	0.018*** (0.006)	-0.018*** (0.005)	0.009 (0.010)
Education (reference group = illiterate)				
Less than primary school	0.132** (0.054)	-0.003 (0.019)	-0.005 (0.011)	0.019 (0.012)
Primary school	0.105 (0.066)	-0.013 (0.016)	-0.008 (0.013)	0.033*** (0.009)
Middle school	0.272*** (0.074)	0.004 (0.013)	0.013 (0.018)	0.028*** (0.010)
Secondary school	0.522*** (0.088)	-0.010 (0.015)	0.034* (0.018)	0.090*** (0.020)
Graduate school	1.057*** (0.102)	-0.030* (0.017)	0.020 (0.052)	0.093*** (0.021)
Years of potential experience	0.042*** (0.002)	-0.001 (0.001)	0.002 (0.001)	0.000 (0.002)
Potential experience squared/100	-0.058*** (0.003)	0.000 (0.002)	-0.003 (0.002)	0.000 (0.003)
No technical education	-0.342*** (0.059)	-0.074*** (0.020)	0.001 (0.034)	-0.003 (0.024)
Currently married	0.105*** (0.035)	0.183*** (0.015)	0.008 (0.007)	-0.056*** (0.018)
Scheduled tribe/scheduled caste	-0.017 (0.029)	-0.057*** (0.008)	0.007 (0.019)	0.009 (0.014)
Hindu	-0.054* (0.026)	-0.017 (0.014)	0.026** (0.011)	-0.023** (0.011)
Household headed by a man	0.148* (0.078)	-0.169*** (0.029)	-0.022 (0.031)	0.014 (0.021)
Rural	-0.010 (0.034)	-0.007 (0.014)	-0.009 (0.018)	-0.159*** (0.019)
No. of pre-school children in household	-0.006 (0.016)	-0.002 (0.005)	0.004 (0.009)	-0.011** (0.006)

**Notes:** Weighted to national level with weights provided by the NSSO in each year. Standard errors, in parentheses, are clustered by state. The notation \*\*\* is  $p < 0.01$ , \*\* is  $p < 0.05$ , \* is  $p < 0.10$ . All regressions include state dummies, year dummies, state public finance controls, and a constant. There are 63,592 observations at the individual level. The log wage column shows coefficients from OLS regressions. The full-time, cash only, and secure job columns show marginal effects from logit regressions.

**Table 4.** Effects of Labor Law Amendments on Job Quality for Men: Alternative Models

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<b>Log Wages</b>				
Adjustment	0.340*** (0.043)	--	--	0.345*** (0.044)
Disputes	-0.053*** (0.018)	--	-0.021 (0.020)	-0.031 (0.049)
Chapter 5b	--	0.388*** (0.045)	0.567*** (0.057)	--
Disputes * Chapter 5b	--	--	0.163*** (0.023)	--
Adjustment * Disputes	--	--	--	-0.008 (0.015)
<b>Works Full-Time</b>				
Adjustment	0.014* (0.008)	--	--	0.012 (0.008)
Disputes	0.018*** (0.006)	--	0.002 (0.009)	0.011** (0.005)
Chapter 5b	--	-0.001 (0.008)	0.031*** (0.009)	--
Disputes * Chapter 5b	--	--	0.026*** (0.004)	--
Adjustment * Disputes	--	--	--	0.002 (0.002)
<b>Works for Cash Only</b>				
Adjustment	0.011 (0.016)	--	--	0.013 (0.015)
Disputes	-0.018*** (0.005)	--	-0.009 (0.007)	0.001 (0.017)
Chapter 5b	--	0.029** (0.012)	0.017 (0.021)	--
Disputes * Chapter 5b	--	--	-0.003 (0.011)	--
Adjustment * Disputes	--	--	--	-0.006 (0.004)
<b>Has Secure Job</b>				
Adjustment	0.003 (0.017)	--	--	0.004 (0.009)
Disputes	0.009 (0.010)	--	-0.012* (0.007)	-0.017* (0.010)
Chapter 5b	--	0.011 (0.011)	0.038*** (0.012)	--

Disputes * Chapter 5b	--	--	0.027 <sup>***</sup> (0.006)	--
Adjustment * Disputes	--	--	--	0.008 <sup>***</sup> (0.003)

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**Notes:** Weighted to national level with weights provided by the NSSO in each year. Standard errors, in parentheses, are clustered by state. The notation <sup>\*\*\*</sup> is p<0.01, <sup>\*\*</sup> is p<0.05, <sup>\*</sup> is p<0.10. All regressions include individual and household characteristics, state dummies, year dummies, state public finance controls, and a constant. There are 63,592 observations at the individual level. The log wage panel shows coefficients from OLS regressions. The full-time, cash only, and secure job panels show marginal effects from logit regressions.

**Table 5.** Determinants of Job Quality in India's Manufacturing Sector for Women Workers

	<i>Log Wages</i>	<i>Works Full-Time</i>	<i>Works for Cash Only</i>	<i>Has Secure Job</i>
Amendments to Labor Regulations:				
Adjustment	0.315* (0.152)	0.104** (0.045)	0.040 (0.033)	0.093** (0.043)
Disputes	-0.019 (0.082)	-0.043 (0.030)	-0.008 (0.023)	-0.082* (0.047)
Education (reference group = illiterate)				
Less than primary school	0.015 (0.097)	-0.059* (0.031)	-0.016 (0.020)	0.000 (0.028)
Primary school	0.048 (0.062)	-0.088 (0.058)	-0.026 (0.019)	0.063** (0.029)
Middle school	0.182 (0.117)	-0.125** (0.058)	-0.006 (0.016)	0.020 (0.024)
Secondary school	0.435*** (0.102)	-0.116** (0.046)	0.005 (0.029)	0.045 (0.060)
Graduate school	1.195*** (0.184)	-0.317*** (0.065)	0.053 (0.036)	0.079 (0.169)
Years of potential experience	0.021*** (0.005)	-0.008** (0.004)	0.002 (0.001)	-0.007*** (0.003)
Potential experience squared/100	-0.035*** (0.009)	0.008 (0.006)	-0.004* (0.002)	0.011** (0.005)
No technical education	0.005 (0.093)	-0.216 (0.136)	-0.014 (0.019)	0.098 (0.071)
Currently married	0.051 (0.043)	0.131*** (0.024)	0.000 (0.013)	-0.031 (0.027)
Scheduled tribe/scheduled caste	0.048 (0.046)	-0.096* (0.053)	-0.005 (0.014)	0.022 (0.017)
Hindu	0.058 (0.101)	0.037 (0.050)	-0.002 (0.017)	0.015 (0.027)
Household headed by a man	-0.096 (0.071)	-0.298*** (0.057)	0.011 (0.023)	0.085 (0.052)
Rural	-0.002 (0.072)	-0.029 (0.033)	0.031* (0.016)	-0.156*** (0.019)
No. of pre-school children in household	0.065* (0.031)	0.032 (0.020)	0.003 (0.011)	-0.016 (0.013)

**Notes:** Weighted to national level with weights provided by the NSSO in each year. Standard errors, in parentheses, are clustered by state. The notation \*\*\* is  $p < 0.01$ , \*\* is  $p < 0.05$ , \* is  $p < 0.10$ . All regressions include state dummies, year dummies, state public finance controls, and a constant. There are 11,426 observations at the individual level. The log wage column shows coefficients from OLS regressions. The full-time, cash only, and secure job columns show marginal effects from logit regressions.

**Table 6.** Effects of Labor Law Amendments on Job Quality for Women: Alternative Models

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<b>Log Wages</b>				
Adjustment	0.315* (0.152)	--	--	0.216** (0.090)
Disputes	-0.019 (0.082)	--	0.044 (0.054)	-0.363*** (0.097)
Chapter 5b	--	0.489*** (0.069)	0.817*** (0.095)	--
Disputes * Chapter 5b	--	--	0.252*** (0.031)	--
Adjustment * Disputes	--	--	--	0.134*** (0.033)
<b>Works Full-Time</b>				
Adjustment	0.104** (0.045)	--	--	0.059 (0.038)
Disputes	-0.043 (0.030)	--	-0.249*** (0.030)	-0.150*** (0.014)
Chapter 5b	--	0.151*** (0.037)	0.212*** (0.049)	--
Disputes * Chapter 5b	--	--	0.291*** (0.021)	--
Adjustment * Disputes	--	--	--	0.040*** (0.010)
<b>Works for Cash Only</b>				
Adjustment	0.040 (0.033)	--	--	0.040* (0.024)
Disputes	-0.008 (0.023)	--	0.052*** (0.007)	-0.040 (0.039)
Chapter 5b	--	0.102*** (0.016)	0.124*** (0.024)	--
Disputes * Chapter 5b	--	--	-0.031*** (0.010)	--
Adjustment * Disputes	--	--	--	0.009 (0.008)
<b>Has Secure Job</b>				
Adjustment	0.093** (0.043)	--	--	0.103*** (0.013)
Disputes	-0.082* (0.047)	--	-0.124*** (0.015)	-0.160*** (0.019)
Chapter 5b	--	0.222*** (0.040)	0.261*** (0.009)	--

Disputes * Chapter 5b	--	--	0.134 <sup>***</sup>	--
			(0.010)	
Adjustment * Disputes	--	--	--	0.029 <sup>***</sup>
				(0.005)

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**Notes:** Weighted to national level with weights provided by the NSSO in each year. Standard errors, in parentheses, are clustered by state. The notation <sup>\*\*\*</sup> is p<0.01, <sup>\*\*</sup> is p<0.05, <sup>\*</sup> is p<0.10. All regressions include individual and household characteristics, state dummies, year dummies, state public finance controls, and a constant. There are 11,426 observations at the individual level. The log wage panel shows coefficients from OLS regressions. The full-time, cash only, and secure job panels show marginal effects from logit regressions.

**Table 7.** Determinants of Average Skill Levels in India’s Manufacturing Sector: Alternative Models for Men

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<b>Is Literate</b>				
Adjustment	-0.042 <sup>***</sup> (0.010)	--	--	-0.052 <sup>***</sup> (0.014)
Disputes	-0.008 (0.008)	--	-0.001 (0.010)	-0.021 <sup>*</sup> (0.012)
Chapter 5b	--	-0.063 <sup>**</sup> (0.026)	-0.067 <sup>***</sup> (0.022)	--
Disputes * Chapter 5b	--	--	-0.020 (0.013)	--
Adjustment * Disputes	--	--	--	0.010 (0.006)
<b>Has Secondary or Graduate Education</b>				
Adjustment	-0.004 (0.012)	--	--	0.009 (0.015)
Disputes	-0.005 (0.007)	--	0.003 (0.008)	0.011 (0.013)
Chapter 5b	--	0.019 (0.023)	0.012 (0.019)	--
Disputes * Chapter 5b	--	--	-0.026 <sup>***</sup> (0.009)	--
Adjustment * Disputes	--	--	--	-0.012 <sup>*</sup> (0.007)

**Notes:** Weighted to national level with weights provided by the NSSO in each year. Standard errors, in parentheses, are clustered by state. The notation <sup>\*\*\*</sup> is  $t \geq 2.58$ , <sup>\*\*</sup> is  $t \geq 1.96$ , <sup>\*</sup> is  $p \geq 1.64$ . All regressions include regional dummies, year dummies, and state public finance controls. All regressions have 80 observations at the state-year level and are estimated with OLS.

**Table 8.** Determinants of Average Skill Levels in India's Manufacturing Sector: Alternative Models for Women

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<b>Is Literate</b>				
Adjustment	-0.064** (0.027)	--	--	-0.051* (0.027)
Disputes	0.054** (0.023)	--	0.077** (0.030)	0.074** (0.032)
Chapter 5b	--	-0.069** (0.031)	-0.095** (0.042)	--
Disputes * Chapter 5b	--	--	-0.070** (0.030)	--
Adjustment * Disputes	--	--	--	-0.015 (0.010)
<b>Has Secondary or Graduate Education</b>				
Adjustment	-0.005 (0.011)	--	--	0.010 (0.011)
Disputes	-0.010 (0.009)	--	0.002 (0.008)	0.014 (0.011)
Chapter 5b	--	-0.004 (0.027)	-0.007 (0.023)	--
Disputes * Chapter 5b	--	--	-0.029** (0.012)	--
Adjustment * Disputes	--	--	--	-0.018*** (0.005)

**Notes:** Weighted to national level with weights provided by the NSSO in each year. Standard errors, in parentheses, are clustered by state. The notation \*\*\* is  $t \geq 2.58$ , \*\* is  $t \geq 1.96$ , \* is  $p \geq 1.64$ . All regressions include regional dummies, year dummies, and state public finance controls. All regressions have 80 observations at the state-year level and are estimated with OLS.

**Table 9.** Residual Wage Gap Covariates at the State Level: Alternative Models

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
<b>Residual Wage Gap</b>				
Adjustment	0.057** (0.022)	--	--	0.060** (0.025)
Disputes	0.007 (0.008)	--	-0.005 (0.011)	0.011 (0.019)
Chapter 5b	--	0.112** (0.052)	0.110** (0.055)	--
Disputes * Chapter 5b	--	--	0.035* (0.021)	--
Adjustment * Disputes	--	--	--	-0.003 (0.014)

**Notes:** Weighted to national level with weights provided by the NSSO in each year. Standard errors, in parentheses, are clustered by state. The notation \*\*\* is  $t \geq 2.58$ , \*\* is  $t \geq 1.96$ , \* is  $t \geq 1.64$ . All regressions have 80 observations at the state-year level and are estimated with OLS. Residual wage gaps are constructed with the full panel data set of 75,018 observations and include controls for worker productivity characteristics, state dummies, and year dummies.

## ENDNOTES

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<sup>1</sup> This paragraph on India's economic liberalization is based on information in Krishna and Mitra (1998), Topalova (2007), and Edmonds, Pavcnik, and Topalova (2007).

<sup>2</sup> The survey was administered through interviews with business owners and managers, so all information is at the firm level, with 2,286 observations.

<sup>3</sup> For more discussion of wage differentials among religious groups in India, see Bhaumik and Chakrabarty (2009).

<sup>4</sup> Whether or not a worker engaged in subsidiary work was used to proxy for job security because the NSSO data had no questions on how long someone had held his or her current job.

<sup>5</sup> The small dip in the percentage of workers who worked full-time in 1999 compared to the other years is most likely due to variable construction. The indicator for work intensity in this year was coded differently in the original NSSO source data.

<sup>6</sup> Note that the EOPP source did not include values for 2004 so we constructed in-sample projections for this final year.