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Are all labor regulations equal? Evidence from Indian manufacturing

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Are All Labor Regulations Equal? Evidence from Indian Manufacturing

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Institute for the Study
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Are All Labor Regulations Equal? Evidence from Indian Manufacturing

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ABSTRACT

Are All Labor Regulations Equal? Evidence from Indian Manufacturing*

Using manufacturing data for India, this paper studies the economic effects of legal amendments on two types of labor laws: employment protection and labor dispute resolution legislation. We find that laws that increase employment protection or the cost of labor disputes substantially *reduce* registered sector employment and output. These laws do no seem to benefit workers either, as they do not increase the share of value added that goes to labor. Labor-intensive industries, such as textiles, are the hardest hit by amendments that increase employment protection while capital-intensive industries are the most affected by laws that increase the cost of labor dispute resolution. These adverse effects are not alleviated by the widespread and increasing use of contract labor, particularly in regards to employment. Results are robust to an alternative codification of legal amendments suggested by Bhattacharjea (2006).

JEL Classification: J23, J52, K31

Keywords: employment protection, labor dispute resolution, contract labor, employment, India

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1. Introduction

This paper studies the economic effects of two types of labor legislation in India: laws regulating the termination of employment (employment protection legislation) and laws regulating the resolution of labor disputes. It also studies the effects of the widespread and increase practice of hiring contract labor, a form of employment that is not covered by these two types of labor legislation

More than in other countries, in India labor laws are extremely contentious. According to some observers, they are among the most important constraints to income and job growth, especially in manufacturing and in the registered sector. Firm-level surveys reveal that Indian employers find labor laws to be more restrictive for their growth than in other countries. In this view, restrictive labor laws along with infrastructure constraints largely explain why the manufacturing sector – accounting only for 15 percent of the GDP-- remains so small. In contrast, many others sustain that current labor laws are necessary to warrant a minimum level of welfare to millions of workers. Still, others argue that given that 92% percent of the economic activity takes place in the unorganized sector, labor laws have little bearing on the majority of workers or firms. [1]

In recent years, a few studies have assessed the impact of different aspects of labor legislation on economic and social outcomes in India. This study adds to the existing literature in two ways:

First, while existing studies have focused on employment protection legislation or some composite measures of labor regulations, this paper examines different types of labor laws. In India, there are 45 pieces of central legislation covering many aspects of employment as well as a large number of state laws, whose effects need to be understood.

[1] In this paper, we use the terms "formal", "registered" and "organized" as synonyms. They all denote the fraction of production and employment that occurs in firms of more than 10 workers with power or 20 workers without power and for which the regulations contained in the Industrial dispute act (IDA) apply. It follows that the terms "informal", "unregistered" or "unorganized" cover the rest of output and employment.

For instance, compared to other countries, India loses a greater proportion of person-days and output due to strikes and lockouts, a situation, which is often associated with ineffective dispute resolution laws. This paper provides a first step in that direction, assessing the effects of labor disputes resolution and employment protection laws, including restrictions on firm closure.

Second, while many studies do not consider that firms may have found ways to lessen the effects of laws on their activities, in this study we assess whether the common practice of hiring workers by means of an agency or contractor (contract labor) dampened the effect of other labor laws. Contract labor can be hired only for certain occupations or activities and is exempted from most labor regulations. The share of contract labor in manufacturing has increased substantially during the last decade from around 12 percent of manufacturing employment in 1985 to 23 percent in 2002.

This paper also adds to a small but growing literature exploring within-country effects of changes in labor regulations (Almeida and Carneiro, 2006; Autor, Kerr and Kugler, 2007; and Kugler Jimeno and Hernanz, 2002, Kugler 2004) and to a wider literature which identifies the effects of regulations based on cross country analysis (see for example Nickell 1997; OECD, 1999; Botero et al, 2004; Heckman and Pagés, 2004, Micco and Pagés, 2006; Kahn, 2007). Many of these studies have identified important effects of labor legislation on employment and job flows. Very few, however, assess the effects of labor regulations on output, investment, or firm entry. Even less study the effects of different types of labor market legislation.

Our results indicate that both employment protection and dispute resolution legislation have similar effects on registered employment and output, but the effects differ across wages and productivity and also across industries. Such differences seem to be driven by a larger effect of labor dispute resolution legislation on investment. In fact, across industries, capital-intensive ones are most affected by amendments that increase the cost of resolving labor disputes, while labor-intensive industries, such as textiles, are the hardest hit by amendments that increase employment protection. And, while some

workers may benefit from employment protection legislation through higher wages, workers as a whole appear to be made worse off by both types of legislation. Our results also suggest that the increasing use of contract labor does not ameliorate these costs, particularly in regards to employment.

The remaining part of the paper is organized as follows: Section 2 provides a brief assessment of labor regulations in India.[2] Section 3 reviews previous studies assessing the effect of labor laws on economic outcomes. Section 4 describes the data used in this study. Section 5 describes the main results concerning the impact of employment protection and labor disputes resolution legislation. It also assess whether the increasing use of contract labor has ameliorated these effects. Section 6 explores the robustness of our results to an alternative codification of legal amendments, as well as to accounting for potential reverse causality issues. Finally, Section 7 concludes.

2. A Brief Description of Labor Regulations in India

Labor laws in India are covered by a large number of separate Acts setting minimum wages, conditions of work, payment of wages, benefits, workers' welfare, health and safety provisions, procedures for the resolution of industrial disputes, conditions for hiring and firing workers, and conditions for the closure of establishments. Legislative authority over labor issues falls with both federal and state governments. Over the years, state governments have amended some central acts. In addition, there is also considerable variation in the implementation of the law across states. Therefore, there is substantial variation in labor regulations at the state level.

The most controversial laws deal with the conditions for hiring and retrenching workers and with the closure of establishments. A 1976 amendment to the 1947 Industrial Disputes Act (IDA, 1947) made layoff, retrenchment and closure illegal except with the previous permission of the appropriated government for all firms with more than 300 workers. This coverage was subsequently extended in 1982 to all firms with more than

[2] See also the reports of the first and second National Commission on Labour, the studies contained in the volume *Reforming the Labour* edited by Debroy, B. and P.D. Kaushik (2005) and Ahmad, Pagés and Roy (2007) among others for a more detailed description of labor laws and labor law enforcement in India.

100 employees.[3] Permission to retrench or to close is rarely granted and unapproved separations carry a potential punishment of both a substantial fine and a prison sentence for the employer. Instead, actual compensation for retrenchment is low by international standards. In this event, a *workman* (as defined by the IDA) with more than 240 days of service is entitled to one month's notice and 15 days of compensation for every year of service at 50 percent of basic wages plus dearness allowance.[4]

The IDA also sets conciliation, arbitration and adjudication procedures to be followed in the case of an industrial dispute. It empowers national or state governments to constitute Labour Courts, Tribunals, National Tribunals, Courts of Inquiry, and Boards of Conciliation. The government has the monopoly in the submission of industrial disputes to Conciliation Boards, Courts, Tribunals or National Tribunals. Yet, the employer and the employer can, if they agree, refer the dispute to arbitration. After a dispute has been referred to arbitration, the government may also prohibit the continuation of any strike or lock-out. In industrial disputes originated by the discharge or dismissal of a worker, the court or tribunals can reinstate the worker in the conditions thy see fit if they deem such discharge unjustified. If the employer decides to pursue the matter in a higher court, the employer is liable to pay the foregone wages during the period of proceedings.

Contract workers and workers in casual, temporary (paid for 240 days or less in any 365 day period) and *badli* (substitute) are not considered *workmen* under the IDA and are exempted from the application of severance pay, mandatory notice or retrenchment authorization. From this perspective, labor laws create important incentives to hiring non permanent workers. This process is limited by the vigorous opposition of the unions and by the restrictions on hiring contract and casual labor imposed by the Contract Labour Regulation and Abolition Act. This Act regulates the service conditions of contract labor in firms of 20 or more employees, providing for some basic welfare amenities and provisions against the delay in wage payment. Section 10 of this Act gives authority to

[3]In addition, some states amended chapter Vb above and beyond what is specified in the central Act. For instance in 1980, West Bengal extended chapter Vb to firms hiring 50 or more workers.

[4] In the IDA, workers that are employed in managerial or administrative capacity or that being employed in a supervisory capacity draw wages above 1600 Rp. per month are not considered workmen and therefore are exempted from the provisions of such Act.

the State to prohibit the use of contract labor in any establishment. The relevant factors considered are whether contract labor is employed in work of perennial nature and whether it is also done through regular employers in those establishments or in other establishment of similar nature. Notwithstanding such constraints, the share of contract labor in manufacturing increased by more than 10 percentage points from 1985 to 2002.

There are significant differences in the level and evolution of contract labor across states (Table 1). While some of these differences are likely to reflect differences in the industrial specialization patterns of each state, they can also reflect differences in the implementation and enforcement of contract labor laws. States such as Kerala and West Bengal, with traditionally pro-labor governments have very small fractions of contract labor in manufacturing and their shares have remained constant over the years. In contrast, the share of contract labor is above 40 percent in a number of states, such as Gujarat, Orissa or Andhra Pradesh and has increased considerably in recent years.

The large majority of labor Acts were enacted in the period 1940-1989. During the seventies and particularly during the eighties, a number of central and state amendments increased the variability of the laws across states (see Appendix 1). In most cases, such amendments increased employment protection. They also increased the cost to employers of solving an industrial dispute, although some changes in the opposite direction were also observed. In the nineties the legislative activity came to a halt, with no new amendments in the IDA or Contract Labor Acts. Yet while there have not been important changes in labor laws or in union formal presence or power, increasing recourse to contract labor may have increased flexibility in the labor market.

3. Previous literature

A number of studies have attempted to estimate the effects of labor market regulations on economic outcomes in India and in other countries. Most studies focus on the effect of either employment protection legislation or the effect of some composite, summary measures of regulations, which are often interpreted to stand for the effect of employment

protection. In contrast, there is much less work assessing the effect of labor dispute regulation or the effect of contract labor.

In India, Fallon and Lucas (1991) and (1993) studied the effect of job security laws by analyzing the effects of the 1976 introduction of chapter Vb in the Industrial Disputes Act (IDA), which mandated firms employing 300 or more workers to request permission from the government prior to retrench. They found a large impact on manufacturing jobs: formal employment for a given level of output declined by 17.5 percent. Similarly, Dutta Roy (2004) examined the effects of the 1982 central amendment to the IDA, which extended the prohibition to retrench workers without government authorization to firms that employed hundred or more workers. The author found evidence of substantial adjustment costs in employment but no evidence that such costs were driven or altered by the IDA legislative amendment. Both studies however do not control for other macro or policy change that could confound the before-after comparison.

Besley and Burgess (2004) isolate the effect of a labor reform in a given state, from changes in policies and macroeconomic variables that are common across Indian states, thus better identifying the effect of labor laws. They find labor regulations to have important adverse effects on output and employment, particularly in the registered manufacturing sector. Their measure of regulations aggregates different types of labor regulations and therefore their results are not directly comparable to the other studies. Hasan, Mitra and Ramaswamy (2003) examine whether differences in labor laws explain differences in the way labor markets adjusted to trade reforms. They find that states with more stringent labor regulations (measured as in Besley and Burgess 2004) have lower demand elasticities and these elasticities are less affected by trade reforms. However, Bhattacharjea (2006) raises important concerns regarding the coding of state legislation amendments by Besley and Burgess (2004), which could invalidate results based on that measure of legislation.

Finally Lall and Mengistae (2005) and Amin (2007) examine the influence of labor market regulations –as perceived by employers—on manufacturing and retail sectors

respectively. Lall and Mengistae find that differences in labor regulations, jointly with differences in the severity of power shortages, explain a large share of the productivity gaps between cities. Amin finds that labor regulations reduce employment in retail.

Beyond India, a number of recent studies have examined the effects of labor legislation.[5] Among the most recent studies, Botero el al (2004) find that more protective labor regulations are associated with lower participation and higher unemployment rates. Almeida and Carneiro (2007) find that stricter enforcement of labor regulations constraints firm size and reduces the use of informal labor in Brazil. Micco and Pagés (2007) examine manufacturing data for a number of developing and developing countries and find that employment protection legislation constrains output and employment growth. Autor, Kerr and Kugler (2007) use firm level data across states in the United States and find that stricter employment protection legislation alters job flows and labor productivity.

Finally, a limited number of studies, mostly theoretical, have examined the implications of having a two-tier labor market, one with regular, protected workers and one with temporary or contract workers who are not subjected to the same regulations than regular workers (Boeri (1999), Blanchard and Landier (2002), Cahuc and Postel-Vinay (2002)). These studies find that, in economies with strict employment protection legislation, deregulation of the use of temporary workers may have negative implications in terms of turnover, overall employment and welfare.

4. Data

To perform this study we use a multiplicity of data sources at the state and, in some cases, at the state-industry level for the period 1959-1997. Data on GDP at the state level and for the agricultural, non agricultural, construction, and manufacturing sector come from the Besley and Burgess (2004) database. Data on net value added, wages, capital, employment and number of factories reported in the registered manufacturing sector at

[5] Organization for Economic Cooperation Development (OECD, 1999) Nickell (1997), Kahn (2007), and among others assess the effects of employment protection in a sample of OECD countries. Heckman and Pagés (2004) assess the effects of labor laws in the context of Latin American countries.

the state and state-industry level are from the Annual Survey of Industries (ASI). Data on the percentage of contract workers in registered manufacturing in each state and year also come from this source. Finally, data on industrial disputes are from the Labour Bureau. Table 2 provides a description of variables and data sources.

We follow, with important modifications, Besley and Burgess (2004), (hereafter BB) in exploiting the time variation in state amendments to central labor laws to identify the effect of such changes on economic outcomes. We identify amendments to two types of laws: (a) laws that regulate the procedures for the resolution of industrial disputes (ΔD), and (b) employment protection legislation (ΔEPL). Within the latter, we also distinguish amendments to Chapter Vb ($\Delta Chapter5b$) from other amendments.

Regarding laws that affect the resolution of industrial disputes, we code all state amendments that reduce workers or employers' capacity to initiate and sustain an industrial dispute or that expedite the resolution of industrial disputes *as* $\Delta D = 1$. Instead, we code all amendments that restrict such capacity or extend the period of resolution of an industrial dispute as $\Delta D = -1$. Finally, we code all the state-year pairs for which there is no change in industrial dispute related laws as $\Delta D = 0$. For example, Andhra Pradesh passed the followed amendment to the IDA in 1987

> "If in the opinion of the state government it is necessary or expedient so to do for securing the public safety or the maintenance of public order or services or supplies essential to the life of the community or for maintaining employment or industrial peace in the industrial establishment it may issue an order which (i) requires employers and workers to observe the terms and conditions of an order, (ii) prohibits strikes and lockouts in connection with any industrial dispute"

Since this amendment restricts parties ability to initiate, sustain or win an industrial dispute it is coded as -1. Other examples of amendments concerning the resolution of industrial disputes are amendments that classify some services or industries as public utilities and therefore are subjected to more restrictive laws regarding strikes and lock-

outs.[6] Other amendments that are judged to expedite the resolution of industrial disputes are instances when a state gives more prominence to conciliation or when it increases the powers of more expeditious courts thus reducing the average length of resolution.

Regarding employment protection laws, we code all amendments that limit firms' ability to dismiss workers, make layoffs more expensive, or restrict firm closures as $\Delta EPL=1$,we code as ΔEPL=-1 all amendments that go in the opposite direction and ΔEPL=0 al state-years in which there are no changes. Table 1.A in Appendix provides a list of all state amendments classified and the assigned value of the code in each case. In years and states where there is more than one amendment to a particular type of law, we follow Besley and Burgess (2004) and for each state and date we aggregate individual scores as follows: we code as 1 if the sum of the individual scores is positive, -1 if is negative and 0 if the sum is zero. With this procedure, we identify ten amendments that are judged to reduce the possibility to initiate an industrial dispute or reduce the average resolution time, and five amendments that go in the opposite direction. We also find ten state amendments to employment protection legislation *all* in the direction of increasing protection.

Within employment protection legislation, we also distinguish amendments to Chapter Vb ($\Delta Chapter5b$) from other amendments related with other aspects of employment protection, and code it as described above. Doing this, we identify five state amendments to chapter Vb all in the direction of increasing the stringency of employment protection.

Based on the legislative variables just described, we construct three variables corresponding to the accumulated sum of amendments for labor dispute, employment protection legislation and amendments to Chapter 5b over time in a state *i* up to period *t*. We denominate these three variables, $Dispute_{it}$, EPL_{it}, and $Chapter\ 5b_{it,,}$ respectively.

Finally, we measure the use of contract labor in state *i*, period *t*, ($Contract\ labor_{it}$) *by* the percentage of contract workers in registered manufacturing in each state and year.

[6] Once we identify whether an amendment relates to labor disputes or employment protection we rely on the original coding by Besley and Burgess (2004). See Table 1.A in appendix for a detailed description of the coding.

5. The Effects of Labor Laws

We relate labor laws to economic outcomes, by estimating the following specification:

$$Y_{it} = \tau_i + \tau_t + \beta X_{it} + \phi_a R_{it-1} + \varepsilon_{it} \quad \textbf{(1)}$$

where Y_{it} is an economic outcome such as manufacturing output, employment or wages in state *i* in period *t*, X_{it} is a vector of state controls, and τ_i and τ_t denote a state and time dummy, respectively. R_{it-1} is a vector of regulation measures, such as *EPL or Dispute*,, lagged one period to account for the average lag between enactment and implementation. In some specifications, outcome variables vary at the industry-state level, in which case the specification is augmented with industry dummies.

Table 3 reports the correlation between our regulatory measures and the regulatory measure described in Bestley and Burgess (2004). Interestingly, the correlation between *Disputes* and the Besley and Burgess measure is .90, while the correlation between the latter measure and *EPL* is .54. We observe a much lower correlation between *EPL* and *Disputes* or between *c5b* and *Disputes*, indicating that job security and labor dispute variables reflect different aspects of labor laws, and that as such, they can be included together in the specifications.

Table 4 provides summary statistics of the data used to estimate these specifications both at the state and at the state-industry level. On average, states enacted laws to reduce the occurrence and resolution time of industrial disputes and to increase job security relative to the central act. All data is reported in per capita, or per worker terms. Persons employed refers to all employees (production and non-production) in a given time. In this context, the term “workers” refers to employees directly associated with production.

It should be noted that since most other economic reforms are applied at the national level, this methodology allows identifying the effect of labor laws, enacted at the state level, from the effect of other contemporaneous policies and reforms, enacted at the national level. It also allows distinguishing the effect of labor reforms from the effects of nation-wide shocks, which is not usually possible by just comparing outcomes before and

after labor reforms. In all specifications, we account for the possible autocorrelation of the error term by estimating robust standard errors clustered at the state or at the state-industry level for state-level or industry-state level data, respectively (see Bertrand, Dufflo and Mullainathan, 2004).

5.1 The effect of Job Security and Dispute Resolution Legislation

5.1.1 Effects on output

Table 5 reports the estimates of the impact of different labor market regulations on various output measures. As mentioned above, we include a full set of state and year fixed effects in all specifications. The results suggest that regulations on dispute resolution procedures have a larger effect on output outcomes than regulations on employment security. Nonetheless, a test of the equality of the coefficients does not reject the null hypothesis. Regulations have a higher impact on registered manufacturing output than in sectors such as agriculture or construction where regulations either do not apply or are mildly enforced. Yet, the results for per-capita state output are still sizeable and statistically significant indicating that states that restrict employment adjustment or increase the cost of settling labor disputes grow at a slower rate.

We next assess the robustness of these results when we control for state specific policies and outcomes by means of two additional variables: the state budget deficit as a percentage of GDP and the logarithm of development expenditures per capita. The fiscal position captures the degree by which states implement responsible fiscal policy. The log of development expenditures controls for the degree by which state governments invest in the health and education of their citizens. Since both indicators are likely to be correlated with labor policies and state output outcomes, its exclusion could bias the results. Following Besley and Burgess (2004) we also control for the logarithm of state population.

The results indicate that both dispute resolution regulations and employment protection legislation are associated with strong negative effects on registered manufacturing output (Table 6). The results also suggest that both types of regulations contribute to expanding

the size of the unregistered sector, although coefficients for the unregistered sector are statistically significant at conventional levels only for disputes. The results against suggest a larger effect of *Disputes* than of *EPL*, although an F test does not reject the hypothesis of equality of coefficients. The coefficients indicate large effects: on average, legal amendments that slow down the resolution of industrial disputes or reduce firm's labor adjustment possibilities lead to a reduction in registered manufacturing output of between 15 and 20 percent, and expand unregistered manufacturing output between 6 and 7 percent. The former underscores that while laws intended to increase job security, such as chapter Vb, draw most of the attention, dispute-related laws can also exert a large, if not larger, effect on economic outcomes.

We further attempt to identify the importance of job security regulations by estimating the effects of extending the scope of chapter Vb to smaller firms (Table 6, columns 3-4) Our results, indicate that such amendments lead to a 24 percent decline in registered manufacturing output, although the estimates are not statistically significant at conventional levels.

We next examine possible complementarities between amendments to chapter Vb in IDA and amendments in dispute resolution provisions. These complementarities might emerge from the fact that laws that enhance job security tend to reinforce workers' bargaining power within the firm increasing their ability to initiate and sustain industrial disputes. Conversely, the higher the cost of resolving industrial disputes, the higher the bargaining power that workers can attain with higher employment protection.. The results reported in Table 6 support this hypothesis (Columns 5-6). The negative sign on the interaction variable suggests that both types of amendments feed each other compounding the effects of both types of regulations on output. An amendment to Chapter Vb in the direction of increasing job security increases the effects of dispute resolution laws by another 21 percent points. Thus, the combined effects of amendments to job security and dispute resolution laws on registered manufacturing employment are very large. Such effects are reversed in the unregistered sector. In fact, the results indicate that is the combination of

poorly designed dispute resolution procedures and job security laws what generates a large contraction (expansion) in the registered (unregistered) manufacturing sector.

One possible criticism to the former results is that they could be driven by shifts in the composition of industries within manufacturing and states. In that case, we would be wrongly attributing those effects to regulations. Conversely, to the extent that some industries are more affected by regulations than others, the composition of manufacturing activity could shift towards industries less affected by regulations. In this latter case, manufacturing wide estimates would underestimate the effects of regulations within industries. To account for such effects, we estimate the effects of regulations on net manufacturing value added per capita using variation at the state-industry level. To account for the presence of autocorrelation in the error term within industries and states, we calculate robust standard errors clustered at the industry-state level. We also include a full set of industry-state dummies, and year effects, plus the state policies controls we discussed above.

The results presented in Table 7 confirm that results with aggregated data are robust to further disaggregation by industries and states. As before, we find that both *EPL* and *Disputes* exert large and negative effects on manufacturing value added, and while the point estimates of *Disputes* are larger than for *EPL*, the equality of coefficients hypothesis is not rejected by the data. We also find large, negative and statistically significant effects of amendments that extend chapter Vb to smaller firms. According to these results, on average, state amendments on chapter Vb have been associated with an 18 percent reduction in manufacturing value added. We also confirm the evidence for complementarities between *Disputes* and amendments on chapter Vb. As found in the aggregate data, chapter Vb exerts influence through *Disputes*, that is, its effects are much larger and statistically significant in states where resolving disputes is costlier for employers. We also find evidence of complementarities between *Disputes* and the overall measure of employment protection legislation.

In sum, the former results indicate that regulations that restrict employers' ability to adjust employment or that increase the cost of solving industrial disputes are associated with large output losses in the registered sector and an expansion of the unregistered sector. Importantly, we also find strong complementarities between different laws. We next examine whether labor reforms that exert strong adverse effects on output can nonetheless make registered workers better off by shifting resources from capital to labor.

5.1.2 Effects on employment, wages and other outcomes

Our results indicate that regulations that increase the cost of settling labor disputes or adjusting labor also have an adverse effect on employment (table 8). Making use of state-industry variation, we distinguish between effects on total employment (persons employed) and the effects on the employment of workers directly involved in production (workers employed). The results are very similar when the aggregate rather than the disaggregate data is used. As it was the case for value added, the point estimates suggest a larger effect for *Disputes* than for *EPL*, but a test of equality of coefficients is not rejected. We also identify large adverse employment effects of extending chapter Vb to smaller firms. The effect on total persons employed associated with regulations is larger than on (production) workers.

The estimates suggest again strong complementarities between regulations affecting employment adjustment and dispute resolution procedures in regards to their effects on employment. It is worth emphasizing the large magnitude of the effects. According to our estimates, on average states that implement amendments that increase *EPL* experience a 11 decline in manufacturing employment relative to states that don't reform(column (1))

In addition to welfare effects associated with higher employment security, regulations that decrease value added and employment could benefit workers that hold on to registered sector jobs if their wages increase substantially as a result of regulatory interventions. In table 9 we examine the effects of regulations on wages, productivity, labor share and other outcome indicators to obtain a better idea of the effect of regulations on workers' bargaining power and welfare. The results indicate significantly

different outcomes depending on the type of regulations. While state legal amendments that increase employment protection are associated with a small increase in wages, amendments that increase the cost of resolving industrial disputes have the opposite effect (column (1)). A test on the equality of effects of both types of regulations rejects the null hypothesis.

Column (2) in table 9 suggests that the asymmetric effects in wages are driven by the differential effects on labor productivity. While labor policies that make employment adjustment more costly do not cause a significant dent on labor productivity, increasing the cost of settling labor disputes does. The null hypothesis of equality of coefficients is also rejected in this case. In turn, such effect appears to be driven by a larger adverse effect of *Disputes* on the stock of capital.

Adding the estimates in column (1) of table 9 with those in column (4) of table 8 we find that higher job security and costlier dispute resolution procedures *reduce* workers' wage bill. For legal amendments that increase *EPL,* the decline in employment more than offsets the small rise in wages. As a result, total earnings for organized workers decline. This effect is stronger for regulations that increase *Dispute* since they cause a decline in both wages *and* employment. Finally, the results in Column (3) of table 9 indicate that neither amendments on *EPL* or *Disputes* appear to raise the share of value added in the hands of workers.

Columns (5)–(7) of table 9 explore the channels by which labor regulations lead to employment and capital losses. In particular, it examines whether the reduction in employment and capital is associated with a decline in the number of firms (as a consequence of plant closures and foregone entry) or with a decline in the average size of a plant (both in terms of number of workers and capital stock). We find that *the bulk of the effects on employment come from a decline in the number of factories,* while the number of workers per firm does not change significantly. We also find that about half of the reduction in capital associated with industrial dispute laws is driven by a reduction in the number of firms. The other half is driven by a reduction of the capital stock of the

average plant. It therefore appears that industrial dispute laws lead to a decline in the capital/labor ratio within plants. These results also underscore the importance of firm exit as means of adjustment when employment adjustment is impaired or when profit opportunities dwindle. They also call attention to the costs of regulation in terms of foregone employment and output due to the reduced creation of new firms.

One question that arises from our results is what drives the adverse effects of labor dispute regulations. Are such effects brought by changes in firms' decisions in light of new regulations or are rather driven by a disruption in production and employment directly caused by labor disputes? Table 10 presents the results of re-estimating the basic specification controlling for the number of person-days lost to industrial disputes with the state-level data.[7] It is quite clear that the adverse results of the legislation do not arise from the direct losses associated with industrial disputes. In fact, the direct effect of actual disputes seems to be the opposite, that is force firms to hoard labor without effects on output or earnings. Instead, the former suggest that the adverse effects of legislation concerning the resolution of labor disputes might arise from changes in firms' investment decisions generated by the enactment of such laws.

In sum, while labor regulations are generally seen as means to improve workers' welfare our analysis suggests that in India did not achieve their intended goals. Instead, our findings indicate that more strict regulations are associated with firm closures, lower investments and reduced output in the registered sector. This in turn dries up the demand for labor, offsetting any positive effects on workers' bargaining power brought by the laws. The end result is less job opportunities in the organized sector, and an expansion of the unorganized sector.[8] This is particularly true for costlier dispute resolution, which not only are associated with lower net entry of firm and lower labor demand, but also with lower capital investments per firm, lower labor productivity and lower earnings for workers.

[7] Data on person-days lost in labor disputes are only available at the state level.
[8] Workers' welfare could still improve as a result of labor laws if increased job security or higher benefits offset the negative effects of laws on the wage bill.

5.1.3 Effects Across Industries

Different industries might be differently affected by labor regulations. Micco and Pagés (2006) show that industries that are inherently more volatile –either because they experience more price variation, or because they are subjected to higher demand variance--are more affected by employment protection legislation. The degree of labor and capital intensity can also affect the extent by which some industries are affected by labor regulations relative to others. For example, regulations that increase the price of labor are likely to have a larger effect in labor-intensive sectors, as the price of labor constitutes a more important factor in their overall profitability.

We make use of the state-industry variation to estimate the effect of regulations by industry (table 11). The results indicate that industries are not equally affected. In addition, industries that are more affected by employment adjustment regulations differ from industries affected by industrial dispute resolution regulations. Our results indicate that the repair of capital goods, and the industries producing textiles, furniture, and food products tend to be more affected by job security than industries producing basic chemicals, metal products and parts, rubber, plastic and petroleum or the generation and transmission of electricity. The effects are felt in terms of a reduction in value added and jobs, while the effect on wages is mixed. In some industries, the reduction in value added and jobs associated with employment protection legislation is accompanied by an increase in wages; In others, wages decline in a significant manner.

In contrast, dispute resolution regulations affect more the production of metal products and parts, basic metals, basic chemicals, machinery and equipment, while the least affected industries are the food, apparel, paper and paper products, textiles, wood and furniture and repair of capital goods.

The former suggests that the degree of labor or capital intensity of a given industry plays a role in how it is affected. The results presented in table 12 confirm this hypothesis. Employment protection legislation is associated with higher employment declines in more labor-intensive sectors (as measured by either the average labor share of an industry

during the 1959-1997 period or the rank ordering of industries according to their average labor share during that same period).[9] Instead, capital-intensive sectors are relatively more affected by dispute resolution procedures.

While at this point, we can only speculate about the possible causes of such patterns, one explanation that fits the evidence is the following: Employment adjustment regulations are hard felt in labor intensive sectors because they imply a substantial increase in the price of labor, which is more important for labor intensive sectors. These costs increases come from at least two sources: On the one hand, prohibitions to retrench increase the cost of negotiated severance packages in voluntary retirement schemes negotiated between workers and firms. On the other hand, employment protection regulations raise earnings for workers who remain in their jobs. On their part, regulations that increase the cost of settling industrial disputes also increase the cost of labor and reduce labor demand. They also create substantial uncertainty regarding the cost of an industrial dispute. This is particularly important in industries that operate with more capital, as protracted and costly labor disputes may render capital unusable. This leads to a reduction in investment and a larger decline in the demand for labor.

5.2 The Effect of Changes in the Use of Contract Labor

The increasing use of contract labor is another area of heated controversy. While many consider this practice as one beset with exploitative tendencies, employers have been pressing for extended flexibility in the engagement of contract workers even in core and perennial activities.[10] The increasing use of contract labor across states may have provided employers with the flexibility required in the face of strict employment regulations. They may have also resulted in lower costs for firms and lower income for workers –as firms may be able to pay less for contract labor than for regular workers. Given its significance in overall employment, it becomes important to understand the effects of the widespread use of this type of work. To do so, we add three additional

[9] The degree of labor intensity of a given industry may be itself affected by labor regulations. To minimize this effect we estimate our specifications using both the average labor share and the relative degree (ranking) of labor-intensity in the 1959-1997 period by industry. While the average labor share is likely to have shifted, the ranking of industries is less likely to be affected by regulations.

[10] See for instance CII (2004)

variables to specification (1). These variables are the share of contract labor in manufacturing by state and period, and two interaction terms between our labor law measures and the share of contract labor. As before, we account for the quality of policies implemented at the state level by controlling for fiscal deficit to GDP and log of developmental expenditures. We also lag these variables one period to minimize possible reverse causality problems. It is worth mentioning that adding these variables reduces considerably the size of the sample because a measure of the use of contract labor is only available since 1985. It also constraints our sample to a time period (1985-1997) where relatively fewer legislative changes took place. Given these restrictions, the coefficients on labor regulations are not directly comparable to those obtained with the whole sample.

Our results provide some evidence that the increasing use of contract labor may be reducing the "bite" of labor law on output. Columns (1) and (2) in table 13 present the results of estimating the effect of regulations and its interaction with the share of contract labor using industry data aggregated at the state level. The coefficients on the interaction of regulations with contract labor in column 1 suggest that the adverse effects on value added of both types of regulation are offset by the widespread use of contract labor. Considering that in the last year of the sample, contract labor accounted for 17 percent of manufacturing employment, our estimates imply that contract labor more than offsets for effect of amendments in job security laws and almost offsets the effect of amendments in dispute resolution laws.[11] Column (2) presents the results of the joint effect of regulations and contract labor using the aggregate measure of regulations developed by Besley and Burgess (2004). The positive coefficient on the interaction term suggests again that the use of contract labor outweighs the adverse effect of regulations. The results also indicate that the use of contract labor may increase value added independently of how stringent are labor market regulations as a result of higher labor productivity and/or lower labor costs.

[11] This is based on multiplying the coefficients on the interaction terms between regulations and share of contract labor by 17.2% which corresponds to the average use of contract labor in year 1996.

However, we cannot rule out that the increasing use of contract labor comes as a result of changes in the composition of employment across industries rather than deliberate attempts to counterweight the impact of regulations. While some evidence suggest that the use of contract labor increased more in states whose industries opened more to trade and have more strict labor regulations, Ramaswamy (2005) reports substantial differences in contract labor intensity across industries.[12] Therefore, marked shifts in the composition of industries within states could explain changes in the use of contract labor. To account for this possibility, we re-estimate the results presented in column (1) using the industry-state variation, and thus controlling for the structure of manufacturing employment. We also present results for the same sample 1985-1997 but without including the contract labor variables to disentangle the effect of the inclusion of *de facto* variables from changes in the sample size.

The results for value added using the industry-state variation are shown in column (3). While the sign of the coefficients is unchanged relative to the estimates in column (1) the magnitude of the interaction coefficients is lower and the coefficients are not statistically significant at conventional levels. Comparing the coefficients on the regulatory variables between columns (3) and a specification where we estimate model (1) with the same sample than in column (3) we find that the reduction in significance of *EPL* is not due to the introduction of contract labor but rather to the smaller number of observations.[13]

Columns (4) and (6) presents similar results for total persons and workers employed. The coefficients on the interaction coefficients are either zero or very close to being zero,

[12] In separate regressions not reported in this paper, we find some evidence that the increasing use of contract labor is associated with the interaction of trade liberalization *and* restrictive labor laws. More precisely, we regressed the logarithm of the share of contract labor in every state against a state specific measure of manufacturing tariffs, labor regulations and the interaction of labor regulations and tariffs, plus country and state dummies, and the policy controls used in most of our specifications. Using the Besley and Burgess (2004) measure of regulations, we find that the coefficients on both tariffs and labor regulations are positive while the interaction of labor regulations and tariffs is negative. All coefficients are statistically significant at conventional levels. If we use our measures of regulations, i.e. *EPL* and *Disputes* and their interactions with tariffs, we get that the signs of the coefficients are preserved but the coefficients are not statistically significant.

[13] Estimating specification (1) for the sample 1959-1985 yields strongly negative and statistically significant coefficients on *EPL* suggesting that the reduced variation after 1985 might be responsible for the reduced size and significance of the coefficient.

indicating little evidence that contract labor reduces the adverse effects of regulations on employment. The former suggests that contract labor may be more effective at ameliorating the effects of regulations on output than on employment. This might be due to the fact that regulations reduce the capital-labor, and the output-labor ratio below what would be desired by firms. If contract workers are more productive than regular workers, the introduction of contract labor may ameliorate such effects. It is also quite interesting that the higher the share of contract labor, the lower the adverse investments effects brought by changes in dispute resolution laws (Column (10)) and the higher direct effect on investment (column 10) While it is often emphasized that firms hire contract labor as a way to reduce wage and adjustment costs, the fact that contract workers are not covered by industrial dispute laws seems to be an additional source of interest for employers.

It is also worth emphasizing that the introduction of contract labor has a direct positive effect on employment independently on labor regulations (column 6). Such direct effect does not seem to be attributed to a cost effect, as the coefficient on contract labor in column (8) is negative, but not statistically significant.

6. Endogeneity and Robustness

The results described above suggest that there is a strong association between economic outcomes and labor regulations. However, one lingering concern is that such association may be driven by reverse causality. In particular, it is plausible that the expectation of poor outcomes in the near future increases the likelihood of reforms that either increase job security or make the resolution of disputes more costly. Such relation would generate a negative association between economic outcomes and labor reforms, and yet economic outcomes would not be driven by regulations. To address this concern, we re-estimate our former regressions extending the lag between legal amendments and economic outcomes to 5 and 8 years. While the anticipation of future poor economic outcomes may drive current legal amendments, it is unlikely that legislators or their constituencies can forecast future economic outcomes five or eight years in advance. Table 14 presents our findings. Lagging the regulatory variables 5 or 8 periods does not alter our results.

Another source of concern is the criticism laid down by Bhattacharjea (2006) to the Besley and Burgess (2004) scoring system, which constitutes the base for the coding in this study. In particular, Bhattacharjea´s criticism refers to seven amendments, which he argues are mistakenly coded by Besley and Burgess. We re-code our legislative measures: *Disputes*, *EPL*, *Chapter5b*, as well as the original measure by Besley and Burgess (2004) *Bbreg* based on the recommendations of this study. Table 2.A in the appendix describes the list of modified codes. We then re-estimate our specifications with such measures. The main results do not change, although the coefficient for *EPL* and *chapter5b* become larger as it would be expected, if measurement error is reduced. Table 15 reports the results for the main specifications for output and employment, but as mentioned the rests of the results remain unaltered. The results found by Besley and Burgess (2004) are also robust to these changes (Table 15, columns 7 and 8) One particular area of mention is the very large magnitude of the coefficients now implied by chapter 5b. Part of this large increase may be due to the fact that they are now estimated out of only three amendments in three states: West Bengal, Orissa, and Maharashtra. While the results on table 13 suggest that reverse causality is not driving the results, these large coefficients could indicate that in these three instances some reverse causality could also be at play.

7. Conclusions

Labor regulations are generally introduced to improve the lot of workers. However our results suggest that in India they are not achieving this goal. Not only regulations seem to have created large costs for society, but they have not raised workers' labor share. Instead, workers seem to have been left with an equal share of a smaller cake. In the process a large number of job opportunities in the registered sector may have been lost, and while some workers may have found refuge in the informal sector, the swelling ranks in this sector are likely to be associated with lower earnings in this sector.

We also find that while regulations such as chapter Vb of IDA tend to get all the attention, there are important costs associated with regulations that increase the cost of settling industrial disputes. By reducing investment, employment and wages, they

generate pure costs for workers and for the society as a whole. Improving the conciliation-arbitration-adjudication is a pending reform that could bear important gains for all parties involved[14]

Nonetheless, the attention on chapter Vb seems to be well placed. Our results suggest important employment effects associated with the enactment of amendments to this chapter. Labor intensive sectors such as textiles would have been the hardest hit eroding the comparative advantage of India in labor intensive industries, and in the process removing viable job opportunities for a large number of people.

Perhaps not surprisingly, contract labor has become a common way to deal with these problems. Yet, such solution is no panacea, at it does not seem to alleviate the adverse effects of labor regulations, particularly in regards to employment.

[14] On this issue see A.U. Khan (2005)

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APPENDIX

TABLE 1.A. List of State amendments and coding of *D* and *A* regulation measures (see notes at the end of the Table)

State	Provision	Section	Year	BB score	DS	ΔD	EPLS	ΔEPL
Andhra Pradesh	Allows the appropriate government to declare any industry as a public utility if a public emergency or public interest requires so. In the central act only industries in the First Schedule (public utilities) may be declared thus. Public utilities are more limited in having strikes and lock-outs and the government has greater power to refer industrial disputes in public utilities service to the appropriate court.	2	1949	-1	-1	-1	0	0
Andhra Pradesh	States that where a Tribunal has been constituted under this Act for the adjudication of disputes in any specified industry or industries and a dispute exists or is apprehended in any such industry then the employer or majority of workmen may refer the dispute to that Tribunal. This facilitates referral of disputes to Tribunals as the process does not need to be intermediated by government. In the central act both sides have to apply to the government so it can refer the dispute to a court.	10	1949	-1	-1		0	
Andhra Pradesh	Any services in hospitals or dispensaries are classified as a public utility. Public utilities are more limited in having strikes and lock-outs and the government has greater power to refer industrial disputes in public utilities service to the appropriate court. In the central act these services are not classified as public utilities.	2	1968	-1	-1	-1	0	0
Andhra Pradesh	A Labor Court or Tribunal is granted the power of a Civil Court to execute its award or any settlement as a decree of a Civil Court.	11A-11D	1982	-1	-1	-1	0	0
Andhra Pradesh	If in the opinion of the state government it is necessary or expedient so to do for securing the public safety or the maintenance of public order or services or supplies essential to the life of the community or for maintaining employment or industrial peace in the industrial establishment it may issue an order which (i) requires employers and workers to observe the terms and conditions of an order. (ii) prohibits strikes and lockouts in connection with any industrial dispute.	10A-10K	1987	-1	-1	0	0	1
Andhra Pradesh	Prior payment of compensation to the worker is a condition precedent to the closure of an undertaking. Under the central act payment of compensation does not need to be made prior to closure.	25FFF	1987	1	0		1	

Andhra Pradesh	Where a closed firm is re-opened, workers who were on the roll of a given unit should be given the opportunity to offer themselves for employment in preference to others. Under the central act retrenched workers are given preference but there is less specify as regards rehiring workers from the same unit.	25H	1987	1	0		1	
Andhra Pradesh	Where a worker is reinstated by an award of a Labour Court or Tribunal, his wages will be paid from the date specified in that award whether or not he has been reinstated by the employer.	25HH	1987	1	0		1	
Andhra Pradesh	Failure to comply an order by the state Government which constrains industrial dispute activity in the interests of the public is punishable with imprisonment for a period which is not less than six months and with a fine.	29A	1987	-1	-1		0	
Andhra Pradesh	In the case of an industrial dispute involving an individual worker he has the right to apply directly to the Labour Court for adjudication. No such right is specified in the central act.	2A	1987	1	1		0	
Andhra Pradesh	In place of the Collector, the Chief Judicial Magistrate or the Chief Metropolitan Magistrate are given the power to recover from an employer money owing to a worker as the result of settlement of an industrial dispute.	33C	1987	1	1		0	
Andhra Pradesh	If an employer wants to change the conditions of service applicable to any worker he has to give him a notice of 42 days (instead of 21)	9A	1987	1	0		1	
Gujarat	Failure of the employer to nominate his representatives to Councils within firms is punishable by a fine of 50 rupees and in the case of continuing failure to do so the employer will pay an additional fine which may extend to 50 rupees per day for every day that such failure continues.	30-30A	1973	1	1	1	0	0
Karnataka	In the case of an industrial dispute involving an individual worker he may within a six months period have the right to apply directly to the Labor Court for adjudication. No such right is specified in the central act.	10	1988	1	1	-1	0	1
Karnataka	Increases the power of the conciliation officer in terms of enforcing attendance at hearings regarding industrial disputes, compelling the production of documents and issuing commissions for the examination of witnesses. Also makes clear what the penalties are for non-attendance or failure to produce relevant documents.	11	1988	-1	-1		0	
Karnataka	The state government obtains the power to transfer any industrial dispute pending before a tribunal to any other tribunal constituted by the state government for adjudication.	10A-10K	1988	-1	-1		0	

Karnataka	If in the opinion of the state government it is necessary or expedient so to do for securing the public safety or the maintenance of public order or services or supplies essential to the life of the community or for maintaining employment or industrial peace in the industrial establishment it may issue an order which (i) requires employers and workers to observe the terms and conditions of the order (ii) prevents any public utility service from closing.	10A-10K	1988	-1	-1		0	
Karnataka	The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments of a seasonal character and which employ more than 100 but less than 300 workers. Under the central act these rules only apply to permanent establishments, which employ more than 300 workers.	25K	1988	1	0		1	
Kerala	If in the opinion of the state government it is necessary or expedient so to do for securing the public safety or the maintenance of public order or services or supplies essential to the life of the community or for maintaining employment or industrial peace in the industrial establishment it may issue an order which (i) requires employers and workers to observe the terms and conditions of the order (ii) prevents any public utility service from closing.	10A-10K	1979	-1	-1	-1	0	0
Kerala	Failure to comply an order by the state Government, which constrains industrial dispute activity in the interests of the public is punishable with imprisonment for a period, which is not less than six months and with a fine.	29A	1979	-1	-1		0	
Madhya Pradesh	Increases the power of the labor court to try offences covered both under the Industrial Disputes Act as well as offences covered under a range of other Acts pertaining to labor (which are specified in the Second Schedule of the Industrial Disputes Act).	7	1982	-1	-1	-1	0	0
Madhya Pradesh	Labour court is given the power to deal with every offence punishable under the Labour Disputes Act as well as under a range of other central acts dealing with labour issues.	34	1982	-1	-1		0	
Madhya Pradesh	In the case of criminal cases the Labour Court shall have all the powers under the Code of Criminal Procedure of a Judicial Magistrate of the First Class.	11A-11D	1982	-1	-1		0	
Madhya Pradesh	(i) Undertakings dealing with construction of buildings, bridges, roads, canals, dams or other construction work are no longer exempted from procedures for closing down undertakings. (ii) State government as opposed to central government is deemed the appropriate government in dealing with negotiations regarding procedures for closing down undertakings.	25O	1983	1	0	0	1	1
Maharashtra	Discontinuation or reduction of power supply to an industrial establishment can be used a reason for lay-off (for which workers will receive compensation). Under the central act only shortage of coal, power or raw materials or the accumulation of stocks or the breakdown of machinery are listed as valid reasons for lay-offs	2	1981	1	0	0	1	1

Maharashtra	If being laid off is not due to electricity problems then the workers receive 100% of their wages as compared to the normal 50%.	25C	1981	1	0		1	
Maharashtra	The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments of a seasonal character and which employ more than 100 but less than 300 workers. Under the central act these rules only apply to permanent establishments which employ more than 300 workers.	25K	1981	1	0		1	
Maharashtra	Any employer or worker affected by the decision to close down an enterprise is permitted for 30days from the date of permission to close being granted appeal to an Industrial Tribunal to overturn the decision.	25O	1983	1	0	0	1	1
Orissa	The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments, which employ more than 100 workers. Under the central act these rules only apply to establishments, which employ more than 300 workers.	25 K	1983	1	0	0	1	1
Orissa	Any employer or worker affected by the decision to close down an enterprise is permitted for 30 days from the date of permission to close being granted appeal to an Industrial Tribunal to overturn the decision.	25O	1983	1	0		1	
Rajasthan	Member is defined as someone who is an ordinary member of a Union and who has paid a subscription of not less than four annas per month and who is not in arrears as regards these payments. Such an exact definition does not exist under the central act.	2	1960	-1	-1	-1	0	0
Rajasthan	The definition of employer in the context of an industrial dispute also includes owners who have contracted with persons for the execution of work as part of the industry.	2	1960	1	1		0	
Rajasthan	Registrar is defined as the person appointed to be the Registrar of Unions. This makes it clear who is involved in the bargaining process on behalf of the unions. This definition does not appear in the central act and hence might be subject to interpretation.	2	1960	-1	-1		0	
Rajasthan	Union is defined to be a trade union of employees registered under the Indian Trade Unions Act, 1926. This makes it clear who is involved in the bargaining process on behalf of the unions. This definition does not appear in the central act and hence might be subject to interpretation	2	1960	-1	-1		0	
Rajasthan	The state government has to appoint a Registrar of Unions and may also appoint Assistant Registrars of Unions to work in local areas. This makes it clear who can represent unions within Work Committees.	3	1960	-1	-1		0	
Rajasthan	The state government has the right to refer an industrial dispute to an Industrial Tribunal if it is satisfied that (i) public peace or safety is threatened, serious or prolonged hardship of part of the community is likely to be caused or the industry concerned is likely to be seriously damaged, (ii) the industrial dispute is unlikely to be settled by other means or (iii) it is in the public interest to do so.	10A-10K	1970	-1	-1	-1	0	0

Rajasthan	If in the opinion of the state government it is necessary or expedient so to do for securing the public safety or the maintenance of public order or services or supplies essential to the life of the community or for maintaining employment or industrial peace in the industrial establishment it may issue an order which (i) requires employers and workers to observe the terms and conditions of the order. (ii) prevents any public utility service from closing.	10A-10K	1970	-1	-1		0	
Rajasthan	Failure to comply an order by the state Government, which constrains industrial dispute activity in the interests of the public is punishable with imprisonment for a period, which may extend to one year or with a fine, which may extend to two thousand rupees or with both.	30-30A	1970	-1	-1		0	
Rajasthan	Widens the scope of awards for which the worker can obtain judicial help with securing money owed by a employer to include awards made as the result of an order issued by the state Government to constrain industrial dispute activity in the interests of the public.	33C	1970	1	1		0	
Rajasthan	This describes the supervisory duties of the Registrar of Unions and the rules for registration of unions (which is obligatory). One duty of the Registrar is to ensure that only one union (that with the largest employment) represents a single unit within an industry.	9C	1970	-1	-1		0	
Rajasthan	The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments of a seasonal character and which employ more than 100 but less than 300 workers. Under the central act these rules only apply to permanent establishments, which employ more than 300 workers.	25K	1984	1	0	1	1	1
Rajasthan	Under the central act where workers in a mine have been laid off for reasons of fire, flood or gas explosion the employer doesn't have to receive prior consent. However, the employer has to apply for permission to continue the lay-off beyond 30 days. Here that condition is removed	25M	1984	-1	0		-1	
Rajasthan	Union representatives have to be involved in any negotiations concerning retrenchment of workers. Their involvement is not stipulated under the central act.	25N	1984	1	1		1	
Rajasthan	Undertakings dealing with construction of buildings, bridges, roads, canals, dams or other construction work are no longer exempted from procedures for closing down undertakings.	25O	1984	1	0		1	
Rajasthan	The maximum penalty for lay-off and retrenchment of workers without permission is increased to imprisonment for three months or a fine of two thousand rupees or both (from the one month imprisonment or a fine of one thousand rupees or both) which are the terms stipulated in the central act.	25Q	1984	1	0		1	

Rajasthan	The procedures for lay-off and retrenchment specified in Chapter V-A of the central act are deemed to be applicable to industrial establishments of a seasonal character and which employ more than 100 but less than 300 workers. Under the central act these rules only apply to permanent establishments which employ more than 300 workers.	25S	1984	1	0		1	
Tamil Nadu	Allows the appropriate government to declare any industry as a public utility if a public emergency or public interest requires so. In the central act only industries in the First Schedule (public utilities) may be declared thus. Public utilities are more limited in having strikes and lock-outs and the government has greater power to refer industrial disputes in public utilities service to the appropriate court.	2	1949	-1	-1	-1	0	0
Tamil Nadu	States where a Tribunal has been constituted under this Act for the adjudication of disputes in any specifed industry or industries and a dispute exists or is apprehended in any such industry then the employer or majority of workmen may refer the dispute to that Tribunal. This facilitates referral of disputes to Tribunals as the process does not need to be intermediated by government. In the central act both sides have to apply to the government so it can refer the dispute to a court	10	1949	-1	-1		0	
Tamil Nadu	If in the opinion of the state government it is necessary or expedient so to do for securing the public safety or the maintenance of public order or services or supplies essential to the life of the community or for maintaining employment or industrial peace in the industrial establishment it may issue an order which (i) requires employers and workers to observe the terms and conditions of the order and (ii) prevents any public utility service from closing.	10A-10K	1982	-1	-1	-1	0	0
Tamil Nadu	Failure to comply an order by the state government, which constrains industrial dispute activity in the interests of the public is punishable with imprisonment for a period which is not less than six months and with a fine.	29A	1982	-1	-1		0	
Tamil Nadu	Increases the power of the conciliation officer in terms of enforcing attendance, compelling the production of documents and issuing commissions for the examination of witnesses.	11	1988	-1	-1	0	0	0
Tamil Nadu	In the case of an industrial dispute involving an individual worker he has the right to apply directly to the Labour Court for adjudication. No such right is specified in the central act.	2A	1988	1	1		0	
West Bengal	Any worker who presents himself and is given employment for that day cannot be laid off for that day. However, if he didn't receive a work within 2 hours he is deemed as being laid off. Under the central act only the second condition holds.	2	1974	1	0	0	1	1

West Bengal	Workers involved in sales promotion are included in the definition of workers. This category of employment is not specified in the central act.	2	1980	1	1	1	1	1
West Bengal	Retrenchment, which means termination of employment of a worker, does include workers terminated on grounds of continued ill-health. In the central act termination for these workers is excluded from the definition of retrenchment.	2	1980	1	0		1	
West Bengal	A report of the outcome of conciliation proceedings must be submitted within 60 days of the commencement of conciliation proceedings. In the central act the same report must be produced within 14 days.	12	1980	1	1		0	
West Bengal	In the case of public utility service, the conciliation proceeding is deemed to start on the day, the notice of a strike or lockout is received by a conciliation officer. In the case of other industries the conciliation proceeding is deemed to start on the date conciliation officer asked the parties to join a conference. Under the central act the conciliation proceeding in all industries have to start on the day that notice of a strike or lockout is received by a conciliation officer.	20	1980	1	1			
West Bengal	A Labour Court or Tribunal is granted the power of a Civil Court to execute its award or any settlement as a decree of a Civil Court.	11A-11D	1980	-1	-1		0	
West Bengal	(i) Provides greater detail on the procedures for making awards from Labour Courts or Tribunals including necessary signatories and the timing of awards. (ii) The state government also retains the right to reject, modify any award made by a Labour Court or Tribunal	17A	1980	1	1		0	
West Bengal	The limit of 45 days for workers receiving 50% of their wages upon being laid off (if they worked more than a year) is removed.	25C	1980	1	0		1	
West Bengal	Where a lay-off extends for more than seven days then the worker only has to present himself once a week at the plant in order to be entitled to compensation as opposed to daily as stipulated under the central act.	25E	1980	1	0		1	
West Bengal	Prior payment of compensation to the worker is a condition precedent to the closure of an undertaking. Under the central act payment of compensation does not need to be made prior to closure.	25FFF	1980	1	0		1	
West Bengal	Where a closed firm is re-opened, workers who were on the roll of a given unit should be given the opportunity to offer themselves for employment in preference to others. Under the central act retrenched workers are given preference but there is less specify as regards rehiring workers from the same unit.	25H	1980	1	0		1	
West Bengal	Where a worker is reinstated by an award of a Labour Court or Tribunal, his wages will be paid from the date specified in that award whether or not he has been reinstated by the employer.	25HH	1980	1	0		1	

West Bengal	The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments, which employ more than 50 workers. Under the central act these rules only apply to establishments, which employ more than 300 workers.	25K	1980	1	0		1	
West Bengal	The period after which, if the appropriate government has not responded, the employer can commence layoffs (i.e. treat his application as granted) is extended from 2 to 3 months.	25M	1980	1	0		1	
West Bengal	In place of the Collector, the Chief Judicial Magistrate or the Chief Metropolitan Magistrate are given the power to recover from an employer money owing to a worker as the result of settlement of an industrial dispute.	33C	1980	1	1		0	
West Bengal	If an employer wants to change in the conditions of service applicable to any worker he has to give him a notice of 42 days (instead of 21)	9A	1980	1	0		1	
West Bengal	Provides greater detail on the duties of Labour Courts, Tribunals and National Tribunals with respect to procedure, hearings, commencement of award and the amount of interim relief admissible to workers that have been discharged, dismissed or retrenched.	15	1986	1	1	1	0	0
West Bengal	In the case of an industrial dispute involving an individual worker if no settlement is arrived at within 60 days the party raising the dispute can apply directly to a conciliation officer. Within 60 days from the conciliation officer's certificate they can apply to refer the dispute to labour court. No such right is specified in the central act.	10	1989	1	1	1	0	1
West Bengal	In their application to close down an undertaking the employers have to demonstrate their ability to discharge their liability for payment of compensation to workers.	25O	1989	1	0		1	
West Bengal	Refusal of employment is added as grounds for an individual worker to enter into an industrial dispute with his/her employer. Only discharge, dismissal, retrenchment or other termination of employment, are mentioned as grounds in the central act.	2A	1989	1	1		0	

Source: Data Appendix for Besley and Burgess (2004) and updated until 2002 according to Sachdeva's (2003). EPLS is the code of each individual reform related to employment protection legislation, while ΔEPL is the consolidated score for those reforms for a given state and year. Likewise, DS is the code of each individual reform related with labor disputes, while ΔS is the consolidated one.

TABLE 2.A. List of re-coded state amendments according to Bhatthcharjea (2006)

State	Provision	Section	Year	BB score	DS	ΔD	EPLS	ΔEPL
Andhra Pradesh	Any services in hospitals or dispensaries are classified as a public utility. Bhattacharjea (2006) argues that these are not in manufacturing and therefore irrelevant for this study.	2	1968	***0***	***0***	***0***	0	0
Andhra Pradesh	A Labor Court or Tribunal is granted the power of a Civil Court to execute its award or any settlement as a decree of a Civil Court. Bhattacharjea (2006) argues that this does not need to reduce the cost of resolving labor disputes.	11A-11D	1982	*0*	*0*	*0*	0	0
Madhya Pradesh	In the case of criminal cases the Labour Court shall have all the powers under the Code of Criminal Procedure of a Judicial Magistrate of the First Class. Bhattacharjea (2006) argues that this does not need to reduce the cost of resolving labor disputes The final score for *Dispute* for this state-year does not change because there were other amendments in the direction of reducing costs of disputes.	11A-11D	1982	*0*	*0*	-1	0	0
Madhya Pradesh	(i) Undertakings dealing with construction of buildings, bridges, roads, canals, dams or other construction work are no longer exempted from procedures for closing down undertakings Bhattacharjea (2006) argues that these are not in manufacturing and therefore irrelevant for this study.	25O	1983	*0*	0	0	*0*	*0*
Maharashtra	The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments of a seasonal character and which employ more than 100 but less than 300 workers. Bhattacharjea (2006) questions this on the basis that the same change was adopted at the National level one year later. We however think it best to leave it unchanged to reflect that it changed one year ahead of central code.	25K	1981	1	0	0	1	0
Orissa	The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments, which employ more than 100 workers.. Bhattacharjea (2006) questions this on the basis that the same change was adopted at the National level in 1982. We agree on this one and change the code for ΔD from 1 to zero	25 K	1983	*0*	0	0	*0*	*0*
Rajasthan	The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments of a seasonal character and which employ more than 100 but less than 300 workers. Bhattacharjea questions this on the basis that the same change was adopted at the National level in 1982. We agree on this one and modify the code from 1 to 0. It however does not affect the overall code for ΔD for Rajasthan 1984.	25K	1984	*0*	0	1	*0*	*0*

Notes: List of amendments modified according to Bhattacharjea (2006). Modified codes appear with italic characters. *EPLS* is the code of each individual reform related to labor market adjustment, while ΔEPL is the consolidated score for labor reforms related to employment protection in a given state and year. Likewise, *DS* is the code of each individual reform related with labor disputes, while ΔD is the consolidated one.

Table 1

Percentage of Contract Labor in Manufacturing across Indian States

state	1985	1990	1995	2002
Kerala	1.6	1.8	1.5	2.33
Assam	8.2	6.4	7.9	3.95
Tamil Nadu	6.9	5.2	4.4	7.21
West Bengal	4.6	5.1	5.3	7.63
Delhi	7.5	7.4	4.8	7.64
Karnataka	11.5	10.4	8.1	9.33
Punjab	19.1	8.8	10.8	14.32
Maharashtra	5.7	6.4	12.8	16.34
Bihar	9.8	8	7.8	22.08
Rajasthan	8.8	13.2	14.1	22.25
Madhya Pradesh	13.6	23.1	21.5	23.94
Uttar Pradesh	14.2	12.6	13.5	25.92
Haryana	19	9.9	14.8	28.07
Gujarat	14.5	19.9	23.5	31.27
Jammu & Kashmir	25.4	8	16.1	31.55
Orissa	30	26	28.7	40.14
Andhra Pradesh	33.8	39.9	49.2	62.08
TOTAL	12.1	13.5	16.8	23.22

Source: Annual Survey of Industries

Table 2: Definition of variables and data sources

Name of variable	Description	Source	Period available
Output measures	Net State Domestic Product, for all sectors, agriculture, non-agriculture (all sectors excluding agric.), construction and manufacturing.	EOPP Database	1960-1997
Person-days lost in industrial disputes	Persons days lost in industrial disputes in the Central and State sphere.	Labor Bureau and EOPP Database	1965-1997
State fiscal Deficit	State expenditures minus state revenues	Official statistics	1960-1997
Population	Rural and urban population ('000)	EOPP database	1959-1997
Development Expenditures	Government expenditures in health and education	Official statistics	1959-1997
Net Value added	Value added created in factory. Computed as value of output minus the gross value of input and Depreciation.	ASI	1959-1997
Productive capital	It refers to the last date of operation in the year. It includes fixed (FK) and working capita (WK). FK is the sum of land, buildings, plant machinery and tools and other fixed assets. It also includes intangible assets. WK consist of stock of materials, fuel, semi-finished goods, cash in hand and at the Bank and the sum of pending payments to creditors	ASI	1959-1997
No of persons employed	Average number of all employees, engaged in production (workers) plus employees in supervisory, managerial and administrative work in a day of work. It is computed adding all workers in all shifts and dividing by days of work	ASI	1959-1997
Workers	Number of Workers. The term workers exclude persons holding positions of supervision and management or employed in confidential positions. It includes apprentices as well as persons employed thought contractors	ASI	1967-1997
Wages to Workers	All renumeration payable more or less regularly in each pay period to workers. (Direct wages+bonuses excluding severance pay, payments in kind and employers contributions to social security). They are expressed in gross terms, that is before employees contributions to social security and welfare funds.	ASI	1967-1997
Number of factories Registered	Factories registered under the Indian Factories Act 1948. Refers to any premises where ten or more workers are working (if factory uses power and twenty if it doesn't).	ASI	1959-1997

The EOPP Indian States Data Base from the STICERD, London School of Economics is available online at http://sticerd.lse.ac.uk/eopp/research/indian.asp . ASI is the Annual Survey of Industries produced by the Central Statistical Organization, Department of Statistics, Ministry of Planning, India. Prior to 1973 only data for the sample factory sector (firms that employ 50 workers or more with power or 100 without power) is available while data from 1974 onwards refers to the overall factory sector (firms that employ at least 10 worker with power or 20 without power). While the data for the two periods is not strictly comparable, the time dummies included in our specifications account for the difference. Estimates in which data from the factory survey was extended backwards for the period 1959-1973 using the growth rate of the sample factory sector in the period 1959-1973 yielded very similar results.

Table 3

Pairwise correlations among regulatory variables

	EPL	*Dispute*	*chapter5b*	*BBreg*
EPL	1			
Dispute	0.2239*	1		
chapter5b	0.8322*	0.1949*	1	
BBreg	0.5490*	0.9095*	0.4328*	1

BB*reg* denotes the regulatory measure constructed by Besley and Burgess (2004). * denotes significant at 5%.;

Table 4

Summary Statistics: 1959-1997

State level data					
Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
EPL	624	0.237	0.587	0	3
Dispute	624	-0.277	0.893	-3	3
Chapter5b	624	0.119	0.324	0	1
BBreg	624	-0.122	1.017	-3	4
GDP per capita*	591	2.84E-02	3.40E-02	2.18E-03	1.99E-01
GDP manufacturing per capita*	591	4.52E-03	6.97E-03	1.59E-04	5.40E-02
Registered manuf. GDP per capita*	591	2.94E-03	4.94E-03	3.63E-05	4.22E-02
State-Industry level data (Registered Manufacturing Sector)					
Net value added*	8504	2.47E-04	6.77E-04	6.92E-09	1.62E-02
Persons employed per capita	8630	5.94E-04	9.53E-04	1.15E-07	9.77E-03
Workers employed per capita	7125	4.71E-04	7.60E-04	1.14E-07	8.41E-03
Number registered factories per capita	8634	6.25E-06	1.05E-05	2.85E-08	1.09E-04
Earnings per worker*	7121	1.48E-01	1.53E-01	2.06E-03	1.52E+00
Labor share (workers)	7008	4.34E-01	1.45E+00	1.44E-03	6.97E+01
Productive capital per capita*	8607	8.59E-04	2.79E-03	1.47E-08	7.23E-02

All values marked with (*) are in '00000 of Rs. *EPL* denotes the cumulative sum of all IDA amendments relative to Employment Protection; *Dispute* denotes the cumulative sum of all IDA amendments relative to resolution of Labor Disputes; Chapter*5b* denotes the cumulative sum of all the amendments relative to Chapter 5b. BB*reg* denotes the regulatory measure constructed by Besley and Burgess (2004). See Section 4 and Appendix for details on the construction of regulatory variables and data sources.

Table 5

The Effect of Labor Laws on Gross Domestic Product at the State Level: 1958-1997

	(1) Log GDP per capita	(2) Log Agricultural GDP per capita	(3) Log Non Agricultural GDP per capita	(4) Log GDP in Construction per capita	(5) Log Manufacturing GDP per capita	(6) Log Registered Manufacturing GDP per capita	(7) Log Non Registered Manufacturing GDP per capita
EPL[t-1]	0.011	0.003	-0.013	-0.018	-0.079	**-0.158**	0.055
	(0.27)	(0.09)	(0.31)	(0.25)	(1.15)	**(1.87)+**	(0.60)
Dispute[t-1]	**-0.045**	0.001	**-0.073**	-0.078	**-0.1**	**-0.192**	0.031
	(1.92)+	(0.05)	**(2.91)***	(1.15)	**(2.19)***	**(3.33)****	(0.80)
Number of Obs.	591	591	591	591	591	591	591
Adjusted R-squared	0.99	0.98	0.99	0.95	0.98	0.97	0.95
Ftest *EPL=Dispute*	0.35	0.96	0.3	0.59	0.84	0.75	0.85

In addition to the regressors shown in this table, all specifications include year and state fixed effects; Absolute t-statistics calculated using robust standard errors clustered a the state level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 6

Labor Laws and Gross Domestic Product at the State Level: 1958-1997

	(1)	(2)	(3)	(4)	(5)	(6)
	Log registered Manuf. Ouput per capita	Log unregistered Manuf. Ouput per capita	Log registered Manuf. Ouput per capita	Log unregistered Manuf. Ouput	Log registered Manuf. Ouput per capita	Log unregistered Manuf. Ouput per capita
Chapter5b [t-1]			-0.241	0.047	-0.164	0.021
			(1.24)	(0.32)	(1.23)	(0.16)
EPL [t-1]	-0.149	0.062				
	(1.99)+	(0.79)				
Dispute [t-1]	-0.202	0.074			-0.107	0.032
	(5.80)**	(2.32)*			(2.10)+	(0.60)
Chapter 5b [t-1]**Dispute* [t-1]					-0.218	0.11
					(3.59)**	(1.86)+
Log of Fiscal Deficit to GDP	-0.002	0.039	-0.014	0.044	-0.004	0.04
	-0.14	(2.25)*	-0.72	(2.72)*	-0.3	(2.40)*
Log of Develop. Exp. per capita	0.579	0.322	0.723	0.256	0.551	0.33
	(2.15)*	(1.34)	(2.31)*	(1.01)	(1.91)+	(1.30)
Log of Population	1.542	-1.839	0.522	-1.414	0.8	-1.46
	(2.20)*	(1.69)	(0.52)	(1.31)	(1.28)	(1.42)
Number of Obs.	590	590	590	590	590	590
Adjusted R-squared	0.97	0.96	0.97	0.95	0.97	0.96
Ftest *EPL =Dispute*	0.59	0.9				

In addition to the regressors shown in this table, all specifications include year and state fixed effects. Absolute t-statistics calculated using robust standard errors clustered a the state level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 7:

Effects of Regulations on Value Added. State and Industry Variation

	(1)	(2)	(3)	(4)
	Log Net Manufacturing Value Added per Capita	Log Net Manufacturing Value Added per Capita	Log Net Manufacturing Value Added per Capita	Log Net Manufacturing Value Added per Capita
EPL [t-1]	-0.104			-0.079
	(1.66)+			(1.30)
Dispute [t-1]	-0.257		-0.145	-0.157
	(4.83)**		(1.78)+	(1.92)+
Chapter5b[t-1]		-0.182	-0.078	
		(1.81)+	(0.77)	
Chapter5b [t-1]**Dispute* [t-1]			-0.241	
			(2.93)**	
EPL [t-1]**Dispute* [t-1]				-0.061
				(2.28)*
Log of Fiscal Deficit to GDP	0.028	0.014	0.028	0.028
	(2.05)*	(1.00)	(2.06)*	(2.07)*
Log of Develop. Exp. per capita	0.321	0.53	0.265	0.278
	(1.85)+	(3.07)**	(1.53)	(1.62)
Log of Population	0.868	-0.497	-0.023	0.325
	(1.04)	(0.59)	(0.03)	(0.37)
test *EPL* [t-1]=*Dispute* [t-1]	0.13		0.67	0.5
Observations	8214	8214	8214	8214
Adjusted R-squared	0.89	0.89	0.89	0.89

In addition to the regressors shown in this table, all specifications include year and state-industry fixed effects; Absolute t-statistics calculated using robust standard errors clustered a the state-industry level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 8

Effects of Labor Regulations on Employment. State-Industry Variation

	(1)	(2)	(3)	(4)	(5)	(6)
	Log of persons employed per capita	Log of persons employed per capita	Log of persons employed per capita	Log of workers employed per capita	Log of workers employed per capita	Log of workers employed per capita
EPL [t-1]	-0.11			-0.098		
	(2.08)*			(2.08)*		
Disputes [t-1]	-0.158		-0.08	-0.122		-0.028
	(3.69)**		(1.30)	(3.58)**		(0.58)
Chapter 5b[t-1]		-0.183	-0.123		-0.141	-0.132
		(2.18)*	(1.41)		(1.91)+	(1.66)+
Chapter5b [t-1]**Disputes* [t-1]			-0.169			-0.175
			(2.66)**			(3.55)**
Log of Fiscal Deficit to GDP	0.017	0.008	0.017	0.02	0.014	0.02
	(1.93)+	(0.87)	(1.87)+	(2.51)*	(1.76)+	(2.45)*
Log of Develop. Exp. per capita	0.33	0.46	0.292	0.158	0.28	0.119
	(2.17)*	(3.04)**	(1.91)+	(1.45)	(2.47)*	(1.08)
Log of Population	-0.252	-1.115	-0.883	-0.026	-0.695	-0.761
	(0.36)	(1.62)	(1.18)	(0.04)	(1.11)	(1.11)
Observations	8334	8334	8334	7050	7050	7050
Adjusted R-squared	0.89	0.89	0.89	0.92	0.92	0.92
Ftest *EPL =Dispute*	0.55			0.74		

In addition to the regressors shown in this table, all specifications include year and state-industry fixed effects; Absolute t-statistics calculated using robust standard errors clustered a the state-industry level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 9

Effects of Labor Regulations on Other Outcomes. State-Industry Variation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Log of earnings per worker	Log of labor productivity	Log of share of income to workers	Log of productive capital per capita	Log of factories registered per capita	Log of workers per factory	Log of productive capital per factory
EPL [t-1]	0.033	0.032	0.001	-0.152	-0.112	0.002	-0.037
	(1.78)+	(0.92)	(0.03)	(2.24)*	(1.93)+	(0.04)	(0.60)
Dispute [t-1]	-0.06	-0.077	0.016	-0.215	-0.105	-0.053	-0.112
	(4.25)**	(3.05)**	(0.70)	(3.57)**	(1.83)+	(1.11)	(1.91)+
Log of Fiscal Deficit to GDP	0.007	0.016	-0.008	0.036	0.014	0.004	0.022
	(1.98)*	(1.50)	(0.80)	(2.55)*	(1.48)	(0.43)	(1.61)
Log of Develop. Exp. per capita	-0.016	-0.045	0.025	0.395	0.435	-0.105	-0.03
	(0.34)	(0.49)	(0.31)	(2.10)*	(2.56)*	(0.68)	(0.16)
Log of Population	0.659	0.993	-0.341	1.317	-0.93	0.679	2.232
	(2.33)*	(1.91)+	(0.73)	(1.49)	(1.06)	(0.93)	(2.65)**
Observations	7047	6940	6937	8311	8336	8334	8311
Adjusted R-squared	0.95	0.82	0.42	0.9	0.89	0.80	0.83
Ftest *EPL=Dispute*	0	0.04	0.74	0.56	0.95	0.54	0.48

In addition to the regressors shown in this table, all specifications include year and state-industry fixed effects; Absolute t-statistics calculated using robust standard errors clustered a the state-industry level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 10
State-level estimates

Are results driven by the losses occasionated by industrial disputes?

	(1) Log Registered Manufacturing GDP per capita	(2) Log of persons employed per capita	(3) Log of workers employed per capita	(4) Log of earnings per worker
log of mandays lost in industrial disputes[t-1]	0.024	0.042	0.046	-0.002
	-1.17	(2.99)**	(3.23)**	-0.21
Log of Fiscal Deficit to GDP	0.006	0.032	0.03	0.007
	-0.39	-1.63	-1.57	-1.27
Log of Develop. Exp. per capita	0.301	0.075	0.104	-0.116
	(1.98)+	-0.52	-0.71	-0.8
Log of Population	1.813	0.291	0.115	0.655
	(2.71)*	-0.36	-0.14	-1.28
EPL[t-1]	-0.144	-0.097	-0.1	0.012
	(2.26)*	-1.38	-1.45	-0.3
Dispute[t-1]	-0.176	-0.123	-0.122	-0.045
	(4.45)**	(4.03)**	(3.73)**	-1.52
Observations	496	466	453	449
Adjusted R-squared	0.98	0.92	0.88	0.98

In addition to the regressors shown in this table, all specifications include year and state fixed effects; Absolute t-statistics calculated using robust standard errors clustered a the state level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 11: Effects by Industry

Effect of an amendment to *EPL*	(1)	(2)	(3)	(4)
	Log Net Manufacturing Value Added per Capita	Log of persons employed per capita	Log of workers employed per capita	Log of earnings per worker
Repair of capital goods	-0.933 **	-0.875 **	-1.015 **	0.701 **
Cotton, Silk, Jute textiles	-0.638 **	-0.491	-0.398 **	-0.079 *
Wood, furniture	-0.609 **	-0.457 **	-0.397 **	-0.094 +
paper, paper products	-0.446 **	-0.361 **	-0.351 **	0.038
Transport equipment and parts	-0.209	-0.271 *	-0.252 **	0.029
Food	-0.186 +	-0.108	-0.125	0.154
Water works & supply	-0.186	0.123	0.138	0.109 **
Basic Metals and Alloy industries	-0.185 +	-0.106	-0.106	-0.036
Gas generation and distribution	-0.144	-0.722 *	-0.713 *	0.214 *
Apparel	-0.139	-0.304	-0.037	0.104 **
Beverages, Tobacco	-0.115	0.134	0.238 *	-0.12 +
Non Metalic products	-0.077	-0.176	-0.158 +	-0.006
Machinery & equipment	-0.059	-0.147 +	-0.23 **	0.001
Other manufacturing equipments	-0.05	-0.137	-0.066	0.038
Basic Chemicals	0.009	0.012	-0.1	0.013
Metal products and parts	0.166	0.171	0.126	0.035
Rubber, plastic, petroleum	0.189	0.181	0.242	0.07
Electricity generation and transmision	0.223 *	0.103 +	-0.044	0.2 **
leather, leather products	0.551 **	0.454 *	0.317 +	0.044
Effect of an amendment to *Dispute*				
Metal products and parts	-0.579 **	-0.519 **	-0.413 **	-0.06 +
leather, leather products	-0.555 **	-0.394 **	-0.48 **	-0.087
Basic Metals and Alloy industries	-0.432 **	-0.228 +	-0.122	-0.194
Basic Chemicals	-0.424 **	-0.357 **	-0.183 **	0.033
Machinery & equipment	-0.372 **	-0.184 *	-0.079 +	-0.044 +
Gas generation and distribution	-0.345	0.394	0.357	-0.161
Electricity generation and transmision	-0.322 **	-0.162 *	0.037	-0.243 **
Rubber, plastic, petroleum	-0.283	-0.329	-0.311 +	-0.021
Transport equipment and parts	-0.263	-0.194	-0.128	-0.064 *
Non Metalic products	-0.255 **	-0.142 +	-0.109	-0.024
Beverages, Tobacco	-0.227	-0.218 *	-0.23 *	-0.05
Other manufacturing equipments	-0.216 **	-0.061	-0.11	-0.081 *
Food	-0.194 *	-0.13	-0.061	-0.129 **
Apparel	-0.157	-0.069	-0.283	-0.038
paper, paper products	-0.134	-0.079	-0.036	-0.058
Cotton, Silk, Jute textiles	-0.011	0.037	0.044	0.034
Wood, furniture	0.015	0.115	0.162 +	-0.079 +
Repair of capital goods	0.103 **	0.102 **	0.135 **	-0.254 **
Water works & supply	0.258	0.111	0.023	0.088 **

Each value denotes the coefficient on *EPL* and *Disputes* in regressions which include year, state*industry fixed effects and interactions of the regulatory variables with industry dummies, as well as Log of state fiscal deficit to GDP, log of state development expenditures and log of state population as controls. Absolute t-statistics calculated using robust standard errors clustered a the state-industry level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 12

Do effects vary depending on Labor Intensity of Industries?

	(1) Log of persons employed per capita	(2) Log of persons employed per capita
*EPL[*t-1]	-0.001	0.059
	(0.01)	(0.72)
Dispute[t-1]	-0.29	-0.283
	(3.09)**	(3.46)**
EPL[t-1]* Labor share	-0.257	
	(1.26)	
Dispute[t-1]* labor share	0.313	
	(1.64)	
EPL[t-1]* Ranking labor share		-0.016
		(2.50)*
Dispute[t-1]* Ranking labor share		0.012
		(1.85)+
Observations	8334	8334
Adjusted R-squared	0.89	0.89

In addition to the regressors shown in this table, all specifications include year and state-industry fixed effects, Log of state fiscal deficit to GDP, log of state development expenditures and log of state population as controls.; Ranking labor share refers to the ranking of labor share across industries. Higher rankings imply higher higher labor share. Absolute t-statistics calculated using robust standard errors clustered a the state-industry level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 13

]Effects of Use of Contract Labor

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Log registered Manuf. Ouput per capita	Log registered Manuf. Ouput per capita	Log Net Manufacturing Value Added per Capita	Log Net Manufacturing Value Added per Capita	Log of persons employed per capita	Log of workers employed per capita	Log of earnings per worker	Log of Productive Capital
EPL [t-1]	-0.098		-0.006	0.032	-0.03	-0.026	-0.036	0.055
	(1.46)		(0.07)	(0.42)	(0.38)	(0.33)	(1.15)	(0.43)
Dispute [t-1]	-0.131		-0.177	-0.159	-0.054	-0.048	-0.057	-0.011
	(4.78)**		(2.76)**	(2.62)**	(1.05)	(0.89)	(2.90)**	(0.11)
Share of Contract Labor[t-1]	0.006	0.01	0.007		0.006	0.006	-0.003	0.015
	(0.78)	(2.06)+	(1.17)		(1.63)	(1.73)+	(1.45)	(2.49)*
EPL [t-1]*Share of Contract labor[t-1]	0.012		0.003		0.001	0.000	-0.001	0.001
	(2.40)*		(0.66)		(0.21)	(0.08)	(0.35)	(0.26)
Dispute [t-1]*Share of Contract labor[t-1]	0.007	0.01	0.003		0.000	0.000	-0.001	0.008
	(2.34)*	(2.06)+	(1.07)		(0.30)	(0.18)	(1.07)	(2.77)**
Regulation_BB[t-1]		-0.108						
		(1.67)						
Regulation_BB[t-1]*Share of Contract Labor		0.008						
		(2.95)*						
Observations	191	191	3310	3310	3310	3310	3310	3290
Adjusted R-squared	0.95	0.95	0.91	0.91	0.96	0.96	0.91	0.94
Level of Agreggation?	State	State	state - industry	state - industry	state - industry	state - industry	state - industry	state - industry
Ftest EPL=Disputes	0.66							
Ftest EPL_ShareCL =Dispute_ShareCL	0.32							

In addition to the regressors shown in this table, all specifications control for Log of Fiscal Deficit to GDP, Log of Development Expenditures per Capita and Log of Population. Specifications (1)-(2) include year and state fixed effects while specifications (3) and above include year and state-industry fixed effects; Regulation_*BB* denotes the measure of regulations constructed by Besley and Burgess (2004); Absolute t-statistics calculated using robust standard errors clustered at the state level in specifications (1)-(2) and at the state-industry level in specifications (3) and above, reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 14

Reverse Causality? Regulatory variables lagged 5 and 8 periods

	EPL[t-8]		*Dispute*[t-8]	
	Coeff.	*t-st*	*Coeff.*	*t-st*
Log Net Manufacturing Value Added per Capita	-0.114	(2.30)*	-0.133	(3.18)**
Log of persons employed per capita	-0.108	(3.38)**	-0.115	(3.78)**
Log of workers employed per capita	-0.112	(3.44)**	-0.12	(3.91)**
Log of productive capital per capita	-0.112	(2.04)*	-0.141	(2.91)**
Log of earnings per worker	-0.019	(1.21)	-0.027	(1.91)+
	EPL[t-5]		*Dispute*[t-5]	
	Coeff.	*t-st*	*Coeff.*	*t-st*
Log Net Manufacturing Value Added per Capita	-0.119	(2.20)*	-0.168	(3.79)**
Log of persons employed per capita	-0.104	(2.62)**	-0.121	(3.59)**
Log of workers employed per capita	-0.095	(2.51)*	-0.118	(3.79)**
Log of productive capital per capita	-0.133	(2.20)*	-0.142	(2.70)**
Log of earnings per worker	0.01	(0.62)	-0.042	(3.09)**

Each line corresponds to a separate regression. In addition to lagged measures of regulations, each regression includes country*sector fixed effects, year dummies, state fiscal balance as a fraction of state GDP, log state population and log of state development expenditures. Absolute t-statistics calculated using robust standard errors clustered at the state-industry level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%. State-industry variation

Table 15

Robustness: Effects of regulatory variables as in Bhattacharjea (2006)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Log Net Manufacturing Value Added per capita	Log Net Manufacturing Value Added per capita	Log Persons Employed per capita	Log Persons Employed per capita	Log Workers Employed per capita	Log Workers Employed per capita	Log Net Manufacturing Value Added per capita	Log Persons Employed per capita
EPL **[t-1]	-0.136		-0.145		-0.12			
	(2.03)*		(2.54)*		(2.32)*			
Dispute **[t-1]	-0.213		-0.097		-0.083			
	(3.54)**		(1.98)*		(2.07)*			
Chapter5b **[t-1]		-0.515		-0.449		-0.369		
		(4.53)**		(4.60)**		(4.15)**		
*Bbreg**[t-1]							-0.235	-0.172
							(6.39)**	(5.34)**
Log of Fiscal Deficit to GDP	0.024	0.012	0.014	0.006	0.018	0.013	0.027	0.017
	(1.75)+	(0.86)	(1.5)	(0.69)	(2.26)*	(1.55)	(1.98)*	(1.92)+
Log of Develop. Exp. per capita	0.387	0.585	0.386	0.511	0.199	0.314	0.413	0.38
	(2.24)*	(3.52)**	(2.56)*	(3.53)**	(1.82)+	(2.90)**	(2.46)*	(2.53)*
Log of Population	0.466	-0.491	-0.651	-1.147	-0.283	-0.762	0.731	-0.283
	(0.55)	(0.62)	(0.91)	(1.73)+	(0.44)	(1.26)	(0.89)	(0.41)
Observations	8214	8214	8334	8334	7050	7050	8214	8334
Adjusted R-squared	0.89	0.89	0.89	0.89	0.92	0.92	0.89	0.89
Ftest *EPL=Dispute*	0.49		0.61		0.65			

Notes: In addition to the regressors shown in this table, all specifications include year and state-industry fixed effects; EPL** and *Dispute** and Chapter5b** denote the regulatory variables constructed as indicated in Battacharjea (2006). BBreg*** denotes the labor regulation measure by Besley and Burgess (2004) modified according to Battacharjea (2006). Absolute t-statistics calculated using robust standard errors clustered a the state-industry level reported in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%