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# A Critical Survey of the Literature

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# Labour Market Flexibility in Indian Industry

## A Critical Survey of the Literature

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ABSTRACT

This paper updates, expands and reinforces my earlier critical reviews (Bhattacharjea 2006 and 2009) of the growing literature on the relationship between India's supposedly 'restrictive' labour laws and poor performance on a range of industrial and social indicators. I first summarize the main claims of this literature, and the construction of the indices that it uses to measure inter-state differences in labour regulation. I show, on the basis of a detailed textual analysis of the relevant laws, that the original authors made multiple errors in coding the legal provisions, and that later contributors to the literature misinterpreted the resulting indices as measures of labour market flexibility. I then highlight some econometric issues that undermine their findings, and the difficulties involved in replicating their analyses with a 'corrected' indicator. I briefly discuss two kinds of flaws in some recent papers: they inaccurately capture the employment thresholds at which different sections of the law become applicable, and they wrongly differentiate between contract and 'permanent' workers. I conclude by summarizing evidence of deteriorating labour market outcomes for workers and growing de facto flexibility in Indian industry, without any changes in the regulatory framework.

*KEYWORDS:* India, manufacturing, inter-state inequality, labour regulation, employment protection legislation.

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# LABOUR MARKET FLEXIBILITY IN INDIAN INDUSTRY

## A Critical Survey of the Literature

**Aditya Bhattacharjea**

## I. INTRODUCTION

Browsing through articles on India in the world's leading economics journals would easily convince most readers that the major reason for the country's poor performance in manufacturing has been its excessively pro-worker labour laws. According to this literature, these laws have: reduced output, employment, investment, productivity, entry by new firms, labour turnover, and the elasticity of demand for labour in organized/formal manufacturing; inhibited the response of one or more of these variables to trade liberalization, local demand shocks, and the abolition of investment licensing; encouraged labour unrest; discouraged a potential fall in urban unemployment, slowed consumption growth, and retarded the pace of poverty alleviation; enhanced the negative impact of trade liberalization on trade union representation; induced firms to outsource employment to labour contractors who offer inferior compensation and no job security; and diverted manufacturing activity to the unorganized/informal sector where both productivity and wages are low. Some of these studies also show that these deleterious effects are larger in (or confined to) larger firms, or industries that are relatively more labour-intensive, export-oriented, based on primary products, subject to greater import penetration or demand volatility. The studies use a variety of datasets and cover different spans of time over half a century.

Most of the contributions to this literature partially overlap with each other in respect of the variables that they seek to relate to labour regulation, so instead of the usual practice of citing the relevant authors for each such outcome, the major conclusions of each paper are summarized chronologically in Table 1. The overwhelming impression one gets from this literature is that India's labour regulations have adversely affected a range of economic indicators and, ironically, the interests of labour. The academic literature has started to make an impact on policymaking. After several years of political procrastination, governments of several Indian states have recently amended the relevant laws in the direction of greater

labour market flexibility, and a sweeping amendment has been formulated at the national level. Concurrently, the salience of this research programme in international journals, and citations in scores of articles that have little or nothing to do with India, makes these findings relevant for other countries whose supposedly pro-worker laws are being targeted for reform. This critical review should therefore be of wider interest.

A remarkable feature of this literature is that almost all the contributors use, with or without modification, the 'regulatory measure' of interstate variation in Indian labour law constructed by Besley and Burgess (2004). This measure, which I hereafter refer to as the BB index, was based on state-level amendments to the Industrial Disputes Act (IDA), which is just one out of dozens of Indian labour laws. Whether in its original or modified form, the coefficients estimated on the BB index and its interactions with other variables almost always deliver the expected results, with different dependent as well as control variables, data sources and time periods. Another remarkable feature is that although Besley and Burgess themselves coded the amendments as either 'pro-employer' or 'pro-worker', most of the recent studies that have used their classification have chosen to interpret these categories as synonymous with greater or lesser 'flexibility' in the labour market. This has distorted the policy implications of their research findings.

In this paper, I challenge this misinterpretation of the index as well as Besley and Burgess' coding of many of the amendments. This updates and reinforces my earlier critical surveys of the literature (Bhattacharjea 2006, 2009), which have been cited by many of these authors. I begin in Section II by describing the methodology underlying the BB index, and the modifications made by later authors, especially those who characterised it as an index of labour market flexibility. I show that very few of the IDA amendments that went into the construction of the index, in either its original or modified forms, actually measure 'flexibility' in the sense that it is generally understood. Out of those that might indeed have a bearing on flexibility, a large number—more than the handful of illustrative examples that I cited in my earlier surveys—were erroneously coded by Besley and Burgess, and these errors carry over to the modified versions of their index. I then show that neither the so-called 'OECD index' nor the composite index proposed by Gupta et al (2009), which have been used by some later authors, can be regarded as a measure of flexibility.[1]

[1] I briefly drew attention to this problem in my comments (Bhattacharjea 2014) on Dougherty et al (2014).

In Section III, I discuss the econometric problems inherent in the use of such indices, as well as other methodological shortcomings in the literature. In Section IV, I point out the difficulties involved in attempting to replicate the results of these studies with a 'corrected' and updated index. Next, in Section V, I make some critical remarks about the way in which some of the authors have tried to establish that the employment-based thresholds for the most restrictive clauses of the IDA have resulted in especially adverse outcomes for larger firms, thereby encouraging firms to stay sub-optimally small. I also criticize some of these authors for making a false dichotomy between contract workers and 'permanent' workers. Section VI summarizes the growing evidence of a progressive deterioration in the conditions of industrial workers in the past three decades despite no significant changes being made in the labour laws. This suggests a growing disconnect between labour laws and labour market outcomes, which calls into question the usefulness of this approach to the problems of Indian manufacturing. Section VII summarizes and concludes the paper.[2]

This exercise also sets the record straight on two related matters. First, the studies published in what are widely regarded as the profession's leading journals are almost unanimous in concluding that pro-worker labour regulation has had adverse outcomes. One contribution of this survey is to draw attention to some less prominent studies that come to contrary conclusions, which are summarized in italics in Table 1. Second, I hope to restate and reinforce my own position, which has been somewhat trivialized by the many authors who have cited my earlier surveys. Out of the many issues that I had raised in relation to this literature, they have only picked up some of the coding errors that I had pointed out, and then shown that their conclusions remain robust even if these errors are corrected. Some authors even describe their modified index as being based on a reclassification or recoding that they attribute to me, although I provided no such reclassification. I hope to show in this paper that this entire methodological approach is vitiated by problems that cannot be fixed by correcting a few coding errors.

[2] This survey is confined to studies that explore inter-state variations in labour regulation in India. Given the vastness of this literature, I have not attempted to cover two important bodies of literature which are related to the theme of this paper: international comparisons of the effects of labour market regulation, and theoretical arguments for and against flexible employment relationships. On both of these fronts, recent research shows that employment protection laws result in better outcomes than was conventionally believed: see especially Subramanian (2018), Adams et al (2018), and the papers cited in Storm (2019, p.30).

## II. MEASUREMENT ISSUES

### 1. The Besley-Burgess Index and Its Modifications

Under the Indian constitution, both the central and state governments can amend labour laws. Besley and Burgess (2004) read all the 113 state amendments to the IDA that had been passed between 1947 and 1992, and classified each amendment as pro-worker, pro-employer or neutral, giving it a score of +1, -1 or 0 respectively. If a state passed more than one amendment in a year, it was given a score of +1, -1 or 0 for that year, depending on the overall direction of change. These annual increments or decrements were cumulated to give a time series for each state. Besley and Burgess, as well as Aghion et al (2008), exploited both the intertemporal and interstate variation in the resulting index to drive their results. As there were very few state-level amendments of the IDA after 1989, most later authors retained only the cross-sectional dimension, partitioning states into two or three categories on the basis of either a state's average index value over the period of study, or the value it attained in a particular year. Some authors, beginning with Hasan et al (2007), altered the classification of particular states in light of other evidence. Other authors, beginning with Ahsan and Pagés (2009) and Gupta et al (2009) corrected the coding of a few of the state amendments in light of my observations in Bhattacharjea (2006, 2008), while the so-called OECD Index has been used by some authors. The composite of three alternative classifications constructed by Gupta et al (2009) became especially popular amongst later researchers. Further details of each of these modifications are provided in column (3) of Table 1. I shall now show that each of these measures suffers from serious errors in construction and interpretation.

### 2. Flexible Definitions of 'Flexibility'

Besley and Burgess themselves characterized their 'regulatory measure' "as a representation of the industrial relations climate" (Besley and Burgess, 2004, p.101). I shall return below to the empirical evidence that they offered in support of this claim, which has been ignored by subsequent authors. Aghion et al (2008, p.1397) described the regulatory measure as quantifying "institutional differences across Indian states, particularly labour market regulations". But, in a remarkable semantic shift, most of the later researchers used it as an index of labour market *flexibility*. Several used pro-worker and pro-employer interchangeably with inflexible and flexible in their description of how the index classifies the states; others described it as measuring the strength of employment protection legislation (EPL). Some created a dummy variable which they called FLEX or EPL or LMR (for labour market

rigidity) to categorize states on the basis of the BB index or its modifications. Evidence of these usages is provided in column (3) of Table 1.

Some of these studies go even further and explicitly identify the relevant variable exclusively with restrictions on hiring and firing. For example, Hasan et al (2007) construct a dummy variable based on a slightly modified version of the BB classification, in order to distinguish "states with more flexible labour markets (that is, states in which there are fewer restrictions on the hiring and firing of labour)" (p.467). Adhvaryu et al (2013, p.727) go to the extent of claiming—quite erroneously, as I show below—that in Besley and Burgess, "[e]ach amendment was coded as being either pro-worker, neutral, or pro-employer, depending on whether it lowered, left unchanged, or increased an employer's flexibility in hiring and firing factory workers, respectively". The title of their paper, "Firing Costs and Flexibility", as well as several references to employment protection and job security in their discussion, also reveal their characterization of what the BB index supposedly measures. Both Chaurey (2015, p.226) and Sapkal (2016, p.166) assert—coincidentally, in exactly the same words—that in the BB coding, "A pro-worker (pro-employer) amendment was one that decreased (increased) a firm's flexibility in hiring and firing of workers while a neutral amendment left it unchanged".

Thus, the literature has explicitly or implicitly identified the BB index as a measure of labour market inflexibility or legally-mandated employment protection, which is quite different from how its originators described it.[3] Ironically, many of these papers cite Ahsan and Pagés (2009), but miss its central insight, which was that relatively few of the amendments coded by BB had anything to do with EPL; most were concerned with "procedures for resolution of industrial disputes". They constructed separate indices for these two types of amendment, coding each individual amendment exactly as in BB and also following their aggregation and cumulation procedure.[4] They showed that the resulting EPL

[3] The rudimentary theoretical model proposed by Besley and Burgess (2004, pp.101-102) did sketch the adverse effects of pro-worker laws via two mechanisms that are compatible with a 'flexibility' interpretation: a relative price effect resulting from increases in adjustment costs of hiring and firing labour, and an expropriation effect resulting from firms' reluctance to invest because they anticipate that entrenched workers will expropriate part of the returns. My detailed analysis of their index in the next few sections shows that this interpretation is untenable.

[4] Fagernäs (2010) reclassifies the IDA amendments in a somewhat similar way: either as (a) 'enforcement acts' which accelerate or retard the dispute settlement process, empower labour courts or facilitate enforcement of their awards, or (b) 'pro-worker' ('pro-employer') acts which enhance the protection of workers (employers). Since there is no clear demarcation of EPL amendments in this

and Disputes measures displayed very little correlation with each other, while the original BB index was highly correlated with Disputes.[5] But the latter has only a tenuous connection with 'flexibility' or job security: disputes can arise from many causes other than retrenchment of workers. For example, the IDA also has chapters and schedules dealing with strikes and lockouts, unfair labour practices, wages, allowances, working hours, leave, shifts, classification of workers by grades, and rules of discipline, each of which can be the subject of an industrial dispute that can be settled by conciliation officers and boards, or adjudicated by labour courts and tribunals, as mandated by the Act.

Industrial disputes, therefore, concern matters far beyond 'flexibility'. True, Ahsan and Pagés (2009) showed that output and employment were adversely affected by pro-worker amendments of the EPL and Disputes clauses separately. The coefficients on the EPL indicator actually became larger after the authors recoded a few amendments on the basis of my criticisms in Bhattacharjea (2006). Teitelbaum (2012) also segregated the EPL amendments and came to similar conclusions. However, both Ahsan and Pagés and Teitelbaum pointed out that after excluding some of the amendments on the basis of my critique, the results on EPL are driven by very few amendments in very few states. The more systematic review of the IDA amendments that I undertake below reveals many more instances of miscoding, and even fewer EPL-relevant amendments.

### 3. Which Amendments are Relevant to Labour Market Flexibility?

Strictly speaking, only sections 25A to 25S in Chapters V-A and V-B of the IDA, imposing restrictions on firms' ability to effect layoffs, retrenchments,[6] and plant closures (hereafter

taxonomy, I do not discuss this paper any further, although its major results—which go against the grain of the empirical literature—are summarized in Table 1.

[5] Although my analysis henceforth deals mainly with the EPL amendments, the Ahsan and Pagés Disputes index is not without problems of its own. I return to it below.

[6] These terms are used idiosyncratically in the IDA, so some clarification may be helpful: a layoff is a (temporary) "refusal, failure, or inability of an employer", for reasons beyond his control as specified in the Act, to give employment to workers "borne on the muster roll of his industrial establishment". Retrenchment means the (permanent) termination of the worker's services by the employer. Contrary to the impression conveyed by some of the literature, section 2(oo) of the IDA makes it clear that retrenchment (and therefore the legal restrictions that Chapters V-A and V-B impose upon it) does not cover termination "as a punishment inflicted by way of disciplinary action". Under section 2A of the IDA, individual workers can challenge their dismissal before labour courts and tribunals, which can order their reinstatement, lesser punishment, or compensation under section 11A. But this is not what the flexibility debate is about: judicial recourse against unfair dismissal is allowed in many other countries. (Ahsan and Pagés (2009) classified state amendments to section 2A as part of their Disputes measure rather than as EPL.)

LRC), can be properly regarded as EPL. Only 35 out of the 113 amendments that were classified by BB concern these sections. Subtract 11 amendments to V-B that they coded as zero because they regarded them as irrelevant or neutral in their pro-employer/pro-worker taxonomy. That leaves us with 24 amendments that affected EPL clauses of the IDA.

There is, however, a significant difference in the severity of the restrictions contained in different sections of Chapters V-A and V-B, which become applicable at different levels of employment. Several earlier contributors to the literature (including the present author) mistakenly believed that Chapter V-A applies only to industrial establishments with 50-99 workers. But, as I point out in Bhattacharjea (2017), establishments with less than 50 workers are exempted from only a few sections of Chapter V-A that require compensation for layoffs, maintenance of muster rolls, and 60 days' notice before closure. They are subject to the remaining sections of the Chapter, which require one month's notice and compensation (severance pay) at prescribed rates in cases of retrenchment or closure. Although these clauses do introduce an element of inflexibility into the labour market, they are not uncommon by international standards.[7] Even some of the leading academic proponents of greater flexibility acknowledged that "Until 1976, the provisions of the IDA were fairly uncontroversial" (Hasan et al, 2007, p. 468 n.8). In 1976, a central government amendment inserted into the IDA the notorious Chapter V-B (sections 25K to 25S), which requires plants employing 100 or more workers to obtain prior government *permission* for LRC, and prescribes a longer notice period in cases of retrenchment and closure. An OECD (2007) survey that employed a standardized methodology for international comparisons found that India was an outlier on labour market rigidity solely on account of Chapter V-B. Its principal author later wrote that "If this provision were not in force, the EPL for regular contracts would fall to the OECD average, which happens to be nearly the same as China's 2006

[7] Two other restrictions on retrenchment, which are applicable regardless of the number of workers employed, do however appear unusual. According to section 25G, employers must "ordinarily" retrench workers following a principle that amounts to "last hired, first fired" (although they are allowed to bypass this if they record the reasons); and according to 25H, employers are required to give preference to their retrenched workers before hiring any new workers. On the other hand, the exemption from the requirement to maintain muster rolls in factories with less than 50 workers would make it difficult for their workers to establish that they had served the required 240 days in the year preceding retrenchment in order to become eligible for compensation or rehiring, or their length of service on the basis of which the amount of compensation is calculated. The actual burden of inflexibility or firing costs that the IDA imposes on smaller factories is thus hard to pin down. But what is relevant for the BB index is that out of the relevant sections, only 25H was amended by two states, and these amendments would not change their scores because they simultaneously amended other sections in the same direction.

score" (Dougherty 2009, p.307). Only 15 of the amendments that were assigned non-zero scores by BB pertained to Chapter V-B.

There were also a few amendments outside Chapter V that might legitimately count as EPL-relevant. Ahsan and Pagés (2008) as well as Teitelbaum (2012) include four amendments to those subsections of section 2 that broadened the definition of the terms 'layoff', 'retrenchment', and 'workmen' which are used extensively in Chapters V-A and V-B. Including these four amendments, less than a fifth (19/113) of the amendments coded by BB can be said to pertain to EPL of a kind that is unusually restrictive by international standards. Two amendments to section 9A have also been classified as EPL by these authors. These amendments doubled (from three weeks to six) the notice period that employers were required to give to workers regarding changes in specified service conditions, such as wages and other benefits, working hours, leave, rules governing discipline, or changes in the number of workers employed in any process, occupation, department or shift. Although this can be said to reduce employment flexibility from the perspective of employers, it is obviously not on par with restrictions on LRC, and should not be counted as EPL. However, recalling that several of the papers surveyed above actually treated the BB index as a measure of (in)flexibility rather than employment protection, I include these two amendments, as well as the nine amendments to Chapter V-A, in a broader measure of labour market flexibility.[8] Adding these to the 15 from Chapter V-B and four from section 2 gives us 30 in all. I refer to these henceforth as *flexibility-relevant amendments.*

Thus, even with a generous interpretation of labour market flexibility, just over a quarter (30/113) of the amendments that went into the construction of the BB index are relevant. Treating it as an index of (in)flexibility, much less EPL, job security, or firing costs, is therefore totally unwarranted. Moreover, only one of these 30 was coded as being pro-employer by BB, with the rest being classified as pro-worker. The variation of a restricted flexibility-relevant indicator would therefore range mainly between neutral and pro-worker. I shall return to this issue below, but first I challenge the faulty coding of several of these amendments.

[8] Two amendments to section 25H, which required closed plants to give preference to rehiring their former employees in case they reopen, should also be viewed as restrictions on flexibility rather than EPL. But these amendments are already included in the broader interpretation of flexibility-reducing amendments since they come under Chapter V-A. A clause in section 25S mandates that 25H also applies to the larger plants covered in V-B.

**4. Miscoding of Individual Amendments**

In Bhattacharjea (2006, 2009), I had questioned the Besley-Burgess coding of several amendments in order to illustrate one of the many flaws in their approach. My more detailed re-examination of amendments relevant to flexibility has turned up several more examples of miscoding, which I now present in a consolidated manner, focussing mainly on amendments to Chapter V-B. Readers who are not interested in legal details can skip this section and refer instead to Table 2, which lists the amendments as summarized and coded by BB, and my reasons for questioning their coding.

Between 1981 and 1984, the states of Maharashtra, Orissa, and Rajasthan amended section 25K so as to reduce the employment threshold for applicability of Chapter V-B from 300 to 100 workers. BB correctly coded these amendments as pro-worker. However, the treatment effects of these amendments would have been transient, because they only anticipated by a few years (a few months in the case of Rajasthan) an almost identical amendment by the central government that had been passed in 1982, but was brought into force only in 1984. There was also an egregious error in BB's paraphrasing of the Maharashtra and Rajasthan amendments that made them appear more restrictive than the central amendment by extending the lowered threshold to cover "establishments of a seasonal character". In fact, all three state amendments, as well as the central amendment, *explicitly excluded* such establishments. The Maharashtra amendment was also more limited in its scope, applying only to closures, not layoffs and retrenchments. On the other hand, Uttar Pradesh shows no amendment activity in the BB coding, and consequently gets characterized as 'neutral'. But this is because it has its own IDA which constitutionally has overriding effect in that state. A year after the central amendment of 1982, which reduced the employment threshold for Chapter V-B from 300 to 100, Uttar Pradesh negated it by amending its own Act to retain the threshold at 300 (for closures), and this amendment was upheld by the Supreme Court. This should be counted as a pro-employer deviation from the national template.

These four state amendments were discussed in Bhattacharjea (2006), which can be consulted for details. But a more systematic re-examination of the IDA shows that BB made similar coding errors in regard to several other amendments. They erroneously described Rajasthan's 1984 amendment of section 25S in identical terms (extending rules governing LRC to smaller firms), and coded it as pro-worker. In fact, this amendment applied some of the procedures prescribed for layoff and retrenchment by smaller units under Chapter V-A to the larger establishments falling under the revised threshold of Chapter V-B, as in the central

Act. More reasonably, BB also code as pro-worker an amendment made by West Bengal in 1980, which reduced the threshold for Chapter V-B to 50 workers. This did indeed diverge significantly from the central act, but its effect would also have been transient until it was superseded by the central amendment that set the threshold at 100.[9]

Section 25M of the IDA requires firms to obtain prior government permission for laying off workers, except in cases of shortage of power or natural disasters. According to BB (2004, p.131), Rajasthan amended section 25M in 1984 so as to allow continuation of "layoffs due to natural disasters for more than 30 days without permission": this is the only EPL amendment that they code as pro-employer, which seems reasonable enough. But this too is an error, for two reasons. First, as BB's web appendix[10] describes the amendment, it was applicable only to layoffs in a mine due to "fire, flood, or gas explosion", making it irrelevant for research on the performance of manufacturing. Second, this amendment does not appear in any of the legal compendiums that I have consulted, possibly because it was superseded by the central amendment a few months later which did require the employer to apply for government permission within 30 days to continue a layoff imposed under such circumstances. Section 25M also allows establishments to commence layoffs two months after applying for permission, if they do not get a response from the government. West Bengal amended this section in 1980, increasing this period to three months. But this too would have been erased by the 1984 central amendment that set the period to two months uniformly across the country.

Only one state amended section 25N: Rajasthan in 1984. According to BB (2004, p.131) this amendment required that a "Union representative has to be involved in negotiations concerning retrenchment of workers". They code it a pro-worker, but this amendment too was superseded by the central amendment later the same year, which required the government to provide "a reasonable opportunity to be heard to the employer, the workman, and the persons interested in such retrenchment"—and the last category would surely include

[9] Under Article 254 of the Constitution of India, for subjects (like industrial disputes) that figure in the Concurrent List, if any provision of a state law is "repugnant to" a central law, the state law is void "to the extent of the repugnancy", unless the state law is enacted later and receives the assent of the President of India.

[10] http://www.lse.ac.uk/economics/Assets/Documents/personal-pages/robin-burgess/can-labour-regulation-hinder-economic-performance-data.pdf.

trade union representatives. Again, Rajasthan's amendment should have been coded 0, because the central amendment levelled the playing field shortly thereafter.

I now turn to the restrictions in section 25-O, which governs plant closures. This section was comprehensively amended in the central IDA in 1982, so later state amendments would take precedence over it in case of any divergence (see n 9 above). BB assign a code of +1 to the 1983 Madhya Pradesh and 1984 Rajasthan amendments that extended the restrictions to undertakings set up for the purpose of construction activities. But these should have been disregarded and coded 0 for the purpose of research confined to the performance of the manufacturing sector. Amendments to section 25-O by Maharashtra and Orissa were also wrongly coded as +1. As in the case of the amendments to 25K discussed above, they anticipated the implementation of a central amendment by a few years, with BB highlighting some differences to justify their coding. Again, they seriously misinterpreted the state amendments as "[giving] power of appeal to workers to overturn decision to close down firm" (Besley and Burgess, 2004, p. 131). The slightly more elaborate summary provided in the online appendix of their paper paraphrased it as "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, to appeal to an Industrial Tribunal to overturn the decision". The paraphrase is misleading because it gives the impression that only a decision granting permission for a closure could be appealed, and obviously only workers would make such an appeal. In fact, the relevant clauses in the Maharashtra and Orissa amendments allowed any *employer or workman* to initiate the process of appeal or review of an order *granting or refusing* permission to close an undertaking. The relevant section (25-O(5)) of Orissa's amendment was exactly the same as the central one that had been enacted a year earlier and came into effect a year later, while the corresponding section (25-O(4)) of the Maharashtra amendment was worded slightly differently, but was the same in effect. Thus, both amendments should have been coded 0, for being neutral as between employers and workers, as well as for being no different from the central amendment. Besides, both the summaries (in the BB paper and its online appendix) wrongly attribute the date of the Maharashtra amendment to 1983, whereas it was in fact passed in 1982 with retrospective effect from 1981. Even if it is coded as pro-worker, this misdating not only distorts the intertemporal dimension of the BB index, but also the level it attains: under their scoring rules, other pro-worker amendments in 1981 caused a unit increment in Maharashtra's score, and dating the 25O amendment to 1983 raises it by another unit. But if this amendment had been correctly

dated to 1981, it would have been clubbed with the other pro-worker amendments, and would not have raised the score any further.

Thus, five out of the 15 state amendments to Chapter V-B that were assigned non-zero scores by BB were misinterpreted or irrelevant to manufacturing, and should have been coded zero. Seven others (marked with an asterisk in the last column of Table 2) did diverge in a pro-worker direction from the central template, but their differential effects would have been transient because the central law was amended in 1984 so as to erase the difference within a few months or years. It was therefore wrong to treat these state amendments as permanently elevating the score of the respective states. In order to capture the convergence brought about by the central amendment, the scores of all the remaining states should have been incremented with effect from 1984.[11]

The remaining three amendments that might justify BB's pro-worker coding were of relatively minor significance. Karnataka amended section 25K in 1988 to allow Chapter V-B, at the discretion of the state government, to be applied to establishments whose activities were of a seasonal nature—which would affect very few industries. Rajasthan amended 25Q in 1984 to increase slightly the penalties that could be imposed for layoff and retrenchment without permission. West Bengal amended 25O in 1989 to require employers to demonstrate their ability to pay retrenchment compensation when applying for permission to close down an undertaking. This would hardly have made closure significantly more difficult in what BB describe as a state ruled by a 'hard-left' government which had already passed several more restrictive amendments.

What about flexibility-relevant amendments outside of Chapter V-B? As discussed above, 15 amendments to sections 2, 9A and Chapter V-A fit this description. But even if we accept BB's characterization of these as pro-worker, they were all concentrated in a few years in a few states, and make very little difference to the scores at the state-year level at which the econometric analysis is conducted. Out of the six relevant amendments to sections 2 and 9A,

[11] Besley and Burgess (2004, p.103) argue that the effects of central amendments are captured by year fixed effects. However, this assumes that a central amendment inflicted a common shock across all states. But the 1984 central amendment actually affected only some states by bringing them into line with others that had already implemented the same changes. Inconsistently, the online appendix of their paper shows that they themselves coded three pro-worker state amendments to section 25R as 'neutral' because, as they put it, "Amendment is required given that the section of the central act referring to procedures for closing down undertakings has been amended. Effectively no change." The same argument should have been applied to the seven other amendments that I have flagged.

three were passed in West Bengal in 1980, and one in Maharashtra in 1981, the same years as the other pro-worker amendments discussed above, so they would not affect the states' scores in those years. Of the nine amendments to Chapter V-A, five were in West Bengal in 1980 and one in Maharashtra in 1981, so these again would not affect the state scores. Only Andhra Pradesh, with a pro-worker amendment to 9A and three to Chapter V-A in 1987, gets added to the list of states that made relevant amendments. As argued above, these amendments are relatively mild as compared to those of Chapter V-B. But it is still ironic that all these four amendments were identical to those that had been passed seven years earlier in West Bengal—the archetypal pro-worker state.[12]

**5. Amendments Unrelated to Labour Market Flexibility**

I have shown that amendments relevant to the theme of flexibility or employment protection constituted a minority of the 113 amendments coded by BB, and many of these were miscoded. What about the rest? As noted above, Ahsan and Pagés (2009) were the first to distinguish EPL-relevant amendments from the others, which they called amendments relevant to dispute resolution. They used the latter amendments to construct a separate Disputes index, supposedly capturing how different states affected the cost of dispute resolution, and found that this index too was associated with adverse effects on industrial performance. However, their construction and interpretation of the Disputes measure is questionable. After segregating these amendments, Ahsan and Pagés applied the original BB coding, treating the amendments that BB coded as pro-worker (pro-employer) as raising (reducing) the cost of settling disputes. As I showed in Bhattacharjea (2006), many of the individual Disputes amendments were miscoded by BB, and therefore by Ahsan and Pagés. I also argued that the authors' reliance on the BB pro-worker/pro-employer coding is inappropriate. For example, they code an amendment as pro-employer if it restricts the ability of *both* workers and employers to "initiate, sustain, or win an industrial dispute", or one that allows a state government to prohibit *both* strikes and lockouts (Ahsan and Pagés 2009, p.65).

Teitelbaum (2012) offers a more elaborate critique of Ahsan and Pagés' coding of such amendments. In a very important but little-noticed contribution to the debate, he also reclassifies them along a different dimension: whether they increase or decrease government

[12] Andhra Pradesh was explicitly singled out as a pro-employer state and hailed for its exemplary economic performance by Besley and Burgess (2004, pp.112, 121). Their classification was largely attributable to the state's other (non-EPL) amendments, whose coding I had challenged in Bhattacharjea (2006, p.217).

intervention in industrial disputes. His econometric results, summarized in Table 1, show that more intervention actually results in higher industrial investment, output and productivity.[13] This is consistent with his argument that third-party mediation and institutionalized settlement of grievances provides an alternative to disruptive forms of protest. He also argues that protecting workers' associational rights and encouraging collective bargaining (a) strengthens unions, which reduces management time spent in negotiations; (b) reduces labour turnover by raising worker morale; and (c) forces employers to invest in technology and the skills of regular workers by discouraging employment of casual labour.

**6. Other Measurement Errors**

Apart from these mistakes in coding individual amendments, my earlier surveys had flagged two other errors that Besley and Burgess made in compiling their index. First, any state that amended several sections of the IDA simultaneously was assigned a summary score of +1 or -1 for that year, on the basis of the net direction of change. This amounted to aggregating amendments of very different kinds regardless of their relative importance. Second, the Besley and Burgess cumulation procedure meant that a state that passed a set of pro-worker amendments in one year would have its score changed by +1, whereas another state that passed the same amendments over several years would see its score progressively increased by +1 each time. Specific examples were given in Bhattacharjea (2006).

**7. Alternative Indices of Labour Market Regulation**

Two other indices have gained some traction in the literature. The OECD (2007) index is based on a survey of state government officials and other stakeholders regarding changes in a much broader range of labour regulations and their implementation in different states. But this too is problematic. The OECD questionnaire (summarized in Dougherty 2009) actually solicited responses on the extent of "transaction-cost reducing actions" (from the perspective of employers) in various laws, rules and procedures. As I pointed out in Bhattacharjea (2014), only six of the 50 topics on which questions were asked concerned the IDA, of which only three pertained to its EPL sections. Some other topics concerned the Contract Labour Act and Factories Act, which have some bearing on flexibility, but most of these, as well as the

[13] As indicated in Table 1, Teitelbaum (2012) also constructs a separate EPL index similar to that of Ahsan and Pagés, with a few amendments recoded based on Bhattacharjea (2006). His econometric results show that amending EPL in a more worker-protective direction does have a negative association with industrial performance indicators. But he acknowledges that this result is based on only a handful of amendments. Even these would be subject to some of the additional coding errors documented in this paper.

remaining questions, were irrelevant for manufacturing, or flexibility, or both. Dougherty (2009) accurately describe the resulting index as a "Labour Reform Index", and acknowledged that "there is no clear relationship between the main subcomponents of the labour reform index (i.e. IDA and contract labour) and job turnover. It appears that what is important for flexibility is the overall labour regulatory stance, rather than rules in specific areas" (Dougherty 2009, p. 333). Dougherty et al (2014, p.13) start out by declaring that "although the OECD index can be separated by its subcomponents, we rely on the aggregate measure of labor reform since the index was designed to capture a state's general stance towards labor regulations, more than the character of specific reforms". But they then refer to it as an "EPL index", and use it to partition states into those with flexible and inflexible labour markets and to construct an EPL dummy to assess the impact of labour regulation on various outcomes in manufacturing, even though most of its components are irrelevant to EPL and/or manufacturing.[14]

Gupta et al (2009) (denoted GHK in Table 1) use a partition of states based on the OECD index as one of the three components of their more accurately labeled "Labour Market Regulation" index. This has been used by several later authors, who label it inaccurately as an index of inflexibility or EPL. Be that as it may, the GHK index is deeply problematic. It classifies states into pro-employer, neutral and pro-worker depending on whether they figured in the top, middle, or bottom terciles of the OECD scores. Thus, states that get classified as 'pro-worker' by this procedure are those that lagged behind on implementing pro-employer reforms, not those that implemented pro-worker changes. Further, the scores are based on respondents' subjective assessments of changes in the years preceding 2005, the year in which the questionnaire was administered. This classification thus seems doubly incompatible with the other two that GHK use to construct their composite measure, both of which (being modifications of the BB index) distinguished actual pro-worker legislative changes in the period up to 1992.

[14] The only other authors who exclusively use the OECD index, Goldar and Agarwal (2012), state in the abstract and at various points in their paper that one of their objectives is to estimate econometrically the effect of "labour market rigidities". But they accurately label the variable that they use as an index of labor market reforms. And in their conclusions they scrupulously point out that their database covers predominantly workers in the unorganized sector, which is not covered by the IDA.

## III. ECONOMETRIC ISSUES

In light of these multiple errors in transcription, interpretation, scoring, aggregation and cumulation of the state-level IDA amendments, how should we view the body of econometric research that has used the BB index and its variants? I now modify and extend some of the critical observations I made in my earlier papers. But first, for those readers who are interested mainly in these econometric issues rather than interpretations of the law, it might be helpful to provide the basic regression model used (with modifications) in most of the literature. A typical specification takes the form:

$$\ln(y_{s,t}) = \alpha_s + \beta_t + \gamma r_{s,t-1} + \delta X_{s,t} + \varepsilon_{s,t}$$

where *y* represents the level of various outcome variables in state *s* in year *t*; *r* is the measure of state-level labour regulation (lagged one period); *X* represents a control or policy variable (there are usually many of these); $\alpha_s$ and $\beta_t$ are respectively state and year fixed effects; and $\varepsilon_{s,t}$ is a random error term satisfying the usual properties.

In this setting, an obvious issue that needs to be addressed is attenuation bias in the estimated coefficient of primary interest ($\gamma$) if the labour regulation index ($r$) is measured with error, which has been the thrust of my criticism thus far. In Bhattacharjea (2006), I conceded that the handful of coding errors that I had pointed out would not undermine the main econometric results, because measurement errors in an explanatory variable bias the estimated regression coefficient towards zero. Therefore, coefficients found to be statistically significant by BB and the authors who followed them could be questioned in respect of their magnitude, but not their sign or significance. I now believe that this concession may have been too generous. The standard result on downward attenuation bias is based on the classical errors-in-variables assumption that the measurement errors are random. But the measurement errors documented above were certainly not random: all but two of them involved wrongly scoring an amendment as 1 rather than 0. One (Rajasthan, 25M, 1984) should have been coded 0 rather than -1, and one (Uttar Pradesh, 1983) should have been -1 rather than 0. Attenuation bias may not hold in such cases.[15]

[15] In his comments on Dougherty et al (2014), which uses a modified BB index as well as the OECD index, T.N. Srinivasan went even further, pointing out that there were "errors in measurement all over the place in many variables. Now, if there was only one variable in the right hand side, which has errors of measurement we know the estimate of its coefficient would be biased downward but when

Second, in my earlier papers I had pointed out the irrelevance of the control variables used in the original BB study. The counterpart of this was the omission of relevant control variables. The more recent papers do a somewhat better job on this front, but the recent literature that seeks to apply the insights of the New Economic Geography (NEG) to India has highlighted the importance of a much wider range of factors that influence industrial development at the regional level, including local educational levels, financial and physical infrastructure, the density and diversity of existing local industrial agglomerations and buyer-seller networks, as well as access to large markets and urban centres (Chakravorty and Lall 2007; Ghani et al 2014; Das et al 2015; Mukim 2015).[16] In the Indian context, the allocation of industrial licences and public sector investments by the central government (before 1991), and fiscal concessions offered by state governments (in more recent years), also influenced industrial location. Correlation of any of these omitted variables with the labour regulation measure would bias the estimated coefficient on the latter.

Third, it should be pointed out that many of the studies summarised in Table 1, including the widely-cited paper by Gupta et al (2009), estimate a coefficient on a time-invariant index taking three values (-1, 0 and +1, or the reverse) to represent pro-employer/flexible, neutral and pro-worker/inflexible states. As Srinivasan (2009, p.113) observed while commenting on their paper, this procedure assumes that "the effect on performance of changing laws from inflexible to neutral would be the same as a move from neutral to flexible. There is no reason for such a presumption". Employing separate dummy variables for pro-worker and pro-employer states, with neutral states as the reference category, would have avoided this problem. Srinivasan's observation can perhaps be extended to studies that used the original time-varying BB index, which takes only integer values with states' cumulative scores varying between -2 and +4. Can the authors really claim that a change in the labour regulation measure from -1 to -2 would have an equal and opposite effect as compared to a change from +3 to +4, controlling for everything else?

Finally, as I pointed out in Bhattacharjea (2006), Besley and Burgess had themselves acknowledged that the coefficient on their labour regulation measure becomes statistically insignificant if state-specific time trends are included in the regression model. They repeatedly drew attention to this finding, and the somewhat inconsistent way in which they

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more than one variable on the right hand side is measured with an error even that presumption is not true. It depends upon correlation of measurement errors across variables" (Srinivasan 2014, p.48).

[16] See Bhattacharjea (2012) for an exposition and evaluation of the NEG literature.

dealt with it now deserves greater attention. They reported that inclusion of state time trends did not wipe out the effect of labour regulation on workdays lost to strikes and lockouts, and claimed that "This validates our measure as a representation of the industrial relations climate" (Besley and Burgess 2004, p.101). However, unlike in their subsequent regressions which involved output or employment as dependent variables, neither were any control variables deployed in this exercise, nor was the possibility of reverse causation addressed. There is a distinct possibility that pro-worker amendments were enacted in response to industrial unrest, rather than the other way around, and that omitted variables such as the strength of local trade unions were behind both.

A few pages later, Besley and Burgess acknowledged that the inclusion of time trends did wipe out the effect of regulation on manufacturing output per capita, so regulatory changes could not be said to have led to deviations from pre-existing state-specific trends. Instead, they concluded that "states with similar patterns of labor regulation also have similar long-term trends. Labor regulation therefore appears to be driving differences in these trends" (2004, p.108). The assertion of causality here seems to be untenable, especially in light of a subsequent exercise for which Besley and Burgess did address endogeneity concerns, employing an instrumental variable strategy: these results were not robust to inclusion of time trends. This finding was reported only in a footnote, with the acknowledgement that "we cannot rule out the possibility that the *trends* in manufacturing output prior to our data period were important in the subsequent pattern of manufacturing development" (p. 117, n 29).

The effect of the regulation measure was also knocked out in regressions with state-wise poverty rates as the dependent variable, but now Besley and Burgess argued that "This underlines the need to exercise caution in attributing the effects … to labor regulations as opposed to interactions of underlying differences in the industrial relations climate with regulations" (ibid, p.121) . They finally qualified their conclusions in the following words:

> The fact that our results are not robust to state-specific time trends does raise the question of whether the effects that we are picking up are those due to labor regulations per se or the consequences of a poor climate of labor relations—union power and labor/management hostility—which affect the trend rate of growth within a state. This goes to interpretation of the finding. But either way, the analysis suggests that labor market institutions in India have had an important impact on manufacturing development (p.125).

Thus, Besley and Burgess concluded that their index actually measures a state's "labour market institutions", more specifically its industrial relations climate. None of the subsequent authors, who reinterpreted it to be a measure of employment protection, "inflexibility" or "firing costs", have noted this aspect of their seminal paper (or my earlier attempts to flag it), and very few of them introduced time trends into their own models. And, as pointed out above, Besley and Burgess did not address endogeneity concerns in relation to their strikes and lockouts regressions, which yielded the only results that survived the inclusion of time trends, thereby supporting their claim that industrial relations were driving industrial performance.

Where does that leave us? In a popular introduction to applied econometrics, two eminent practitioners summarized what they called "the key results" from Besley and Burgess in the following pithy statement: "Apparently, labor regulation in India increased in states where output was declining anyway. Control for this trend therefore drives the estimated regulation effect to zero" (Angrist and Pische, 2009, p.241). This is of course quite different from the conclusions drawn by Besley and Burgess themselves, and by scores of later authors who have cited them. What is ultimately driving these trends remains a mystery. But even if labour market conditions contributed to the initial inter-state differences in industrialization, the agglomeration effects highlighted in the NEG literature can give rise to persistent and growing divergences between regions, even if the factors that originally caused these divergences cease to operate. This would retard the industrialization of lagging regions even if they made their labour markets more employer-friendly.

## IV. CORRECTING AND UPDATING THE REGULATION MEASURES

### 1. Replication with a 'Corrected' Index

Several contributors to this literature have re-run regressions using 'corrected' versions of the BB index or the classification of states based on it. Some of these corrections have been attributed to me. But I had only pointed out a few examples of miscoding in my earlier papers, without offering an alternative index or classification. Attempted replication of the earlier authors' analysis with a corrected flexibility-relevant index based on this paper's more systematic critique, with time trends and more appropriate control variables, might seem to

be the way ahead.[17] But going down that road would encounter several obstacles. First, as noted by Storm (2019), a practical difficulty in replicating the BB results is that the dataset they provide on their website has far more missing observations than they acknowledge in their paper.

Second, there was already very limited variation in the original BB index: a total of only 19 changes in ten (out of 16) states over the entire 1947-92 period. After applying my corrections to the restricted set of 30 flexibility-relevant amendments identified in section II.3 above, I find that changes took place in in only six states during the same period, occurring just once in each state (twice in the case of West Bengal). If we leave aside the Uttar Pradesh amendment, the entire variation is between 0 (neutral) and +1 (pro-worker)—and I have questioned the importance of many of the latter amendments. Thus, the cross-sectional as well as intertemporal variation in an appropriately modified labour flexibility index would be much less than that of the parent BB index. For states that made amendments only once, the coefficient on a 'corrected' flexibility-relevant index would obviously be knocked out by inclusion of a time trend.

In particular, the studies that examine more recent developments in Indian industrial performance are forced to use only cross-section variation in the labour regulation measure, because there were very few amendments after 1990. Several of these studies, as indicated in Table 1, construct a dummy variable to distinguish flexible states by merging pro-worker and neutral states as the reference category. If this procedure is followed for the flexibility-relevant amendments that I have isolated and corrected, only one state (Uttar Pradesh, that too only for the period 1982-2002, taking into account the amendments I pointed out above) would merit a value of 1 for this dummy variable, making replication of these studies quite pointless.

[17] Hamermesh (2017), after tracking the citation patterns for the ten most highly-cited articles in empirical labour economics, finds that they do attract a few replication studies, even though very little professional importance is given to replication. He complacently concludes that "Important mistakes do get caught, and important ideas initially tested on only one set of data must survive tests on other data. The market appears to work well", and there is no reason to worry. On the other hand, Storm (2019, p.28) mentions several replication studies that "jointly falsify a dozen high-profile econometric studies, published in peer-reviewed outlets, which all reported negative impacts of pro-worker regulation on unemployment in the OECD economies…. The published results were found to be robustly non-robust, with signs (+/–) of impacts changing and their statistical significance invalidated in response to minor amendments in estimation procedures." His own replication of the baseline BB regression gives very different results (see Table 1), and the estimated coefficients are inconsistent with the theoretical arguments advanced by Besley and Burgess.

Even in the earlier papers that used intertemporally-varying labour regulation measures, results were driven mainly by the cross-section variation between states. Aghion et al (2008, p.1404), for example, showed that the estimated coefficient that yielded what they called their "key result" remained almost unchanged when they replaced the time-varying measure with its 1980 level for each state. In the working paper version of their article (Aghion et al 2006), they had obtained similar results while using the state-wise index level of two other years, or when they partitioned states into three or five groups based on its average level over the entire period. Ahsan and Pagés (2009) found that their results were largely the same if they lagged the labour regulation variable by upto five years. And I have shown above that if we confine ourselves to only flexibility-relevant amendments, there was very little intertemporal variation. Therefore, even if a corrected labour regulation measure were to show that flexibility matters, it would be based largely on inter-state cross-sectional differences that were established decades ago. This would be a fragile basis for prescribing policy changes that will unfold prospectively in real time, particularly in light of the evidence that state-level performance was being driven by pre-existing trends.

Finally, as I documented at length in Bhattacharjea (2009), the key section 25O, which required government permission for plant closures, was held to be unconstitutional by India's Supreme Court in 1978. Following this, High Courts in different states struck down sections 25M and 25N, which required permission for layoffs and retrenchments, respectively. Many of the amendments listed in Table 2 were actually passed by state legislatures between 1980 and 1984 to provide the procedural remedies required by the courts; the central amendments of 1984 were similarly motivated. But many of these curative measures were in turn struck down by High Courts, and were upheld on appeal by the Supreme Court after legal battles that lasted over a decade: the amended section 25O was in fact upheld only in 2002. The BB index and its various modifications do not recognize the fact that these three key sections of Chapter V-B remained inoperative in parts of the country for many years due to court judgments. This problem cannot be solved by further correcting the index to 'switch off' these sections in the relevant states for the periods in which they were inoperative. In Bhattacharjea (2009), I mentioned some cases in which retrenchments that were carried out during such periods without seeking permission were *retrospectively* held to be illegal when the corresponding section of the IDA was ultimately upheld. The courts ordered the workers to be reinstated after more than a decade, with full back wages for the period since their retrenchment. In this situation, firms would have been wary of going ahead with hiring and

firing, even in those states and periods in which these sections of the law remained apparently inapplicable, as long as uncertainty prevailed regarding their ultimate legal status. A simple binary coding of the relevant state-years would not even begin to capture the complexity of the situation.

**2. Updating the BB Index with Post-1990 Amendments to the IDA**

The last state amendments that were coded by Besley and Burgess were enacted in 1989. As mentioned above, there have been very few amendments since then. These have been noted by only a few of the later authors, who have not fully grasped their lack of significance. Between 1990 and 2014, only three states made changes to the sections pertaining to flexibility. Uttar Pradesh belatedly fell in line with the rest of the country in 2002 by amending its own IDA so as to reduce the employment threshold beyond which government permission would be required for plant closures from 300 to 100. This was clearly pro-worker, but a standard analysis of the effect of this amendment is confounded by the fact that in the same year, after a legal battle that had lasted over a decade, the Indian Supreme Court finally upheld the constitutional validity of the central amendment to section 25O, as well as its counterpart in Uttar Pradesh.[18] These were the sections that required official permission for plant closures, so this judgment amounted to an undoubtedly pro-worker change, impairing our ability to use the rest of the country as a control for the threshold reduction in Uttar Pradesh.

Two apparently pro-employer amendments also appear less clear-cut when viewed in their entirety. In 2004, Gujarat carved out special provisions covering establishments located in Special Economic Zones by amending various subsections of section 2 and introducing a new Chapter V-D. These changes essentially waived the Chapter V-B requirements of government permission and longer notice periods for retrenchment and closure. But the amendments also tripled the amount of compensation payable to the affected workers. In 2006, Maharashtra amended section 9A (which required 21 days' notice be given to workers regarding changes in specified working conditions), so as to exclude changes "due to updating or replacing of the existing machinery, computerisation, or increase in the immovable property and increase in production". However, this was subject to the conditions that the wages and working hours of the affected workers would not be affected, and they should be provided with training for

[18] *Orissa Textile and Steel Ltd v. State of Orissa* (2002) 2 SCC 578.

the new job. With their very limited scope of application, and their pro-worker safeguards, it is difficult to classify these amendments as unambiguously pro-employer.

Since 2014, several states[19] have raised the threshold of applicability for Chapter V-B from 100 to 300 workers. This provides a new source of pro-employer variation in the most important dimension of EPL. However, its effects may be confounded by the simultaneous IDA amendments made by some of these states so as to increase the retrenchment compensation, as well as pro-employer amendments to other labour laws. In any case, the impact of these changes cannot be statistically established for a few years, allowing for a sufficient period for existing firms to adjust, new firms to enter, and a further lag of two years for the ASI data to be published. But if there had been any boost to industry in the states that did go ahead with the reforms, it would surely have been publicized by at least the governments of Madhya Pradesh and Rajasthan, which were the first to implement them, in the run-up to their state Assembly elections in late 2018. (Most of these changes were in fact based on the template of the central government's draft Industrial Relations Code Bill, 2015.[20] News reports suggest that strong opposition from trade unions—including the federation affiliated to the party in power at the centre—forced the government to put this Bill on hold.)

## V. FUZZY BOUNDARIES: MEASURING THRESHOLD EFFECTS AND RELIANCE ON CONTRACT LABOUR

### 1. Threshold Effects

Some of the studies summarized in Table 1 show that pro-worker regulations have different effects above and below the employment levels of 50 and 100 workers, which correspond to the thresholds at which sections V-A and V-B of the IDA become applicable. There are several problems here, but since they have been discussed at length, with reference to the relevant IDA sections, in Bhattacharjea (2017), I shall summarize them very tersely. First,

[19] Andhra Pradesh, Haryana, Madhya Pradesh, Maharashtra, Rajasthan, Uttarakhand (for closures only) and Uttar Pradesh. See https://labour.gov.in/sites/default/files/Labour_Law_Reforms14-01-2019.pdf.

[20] For the text of the Bill, see http://www.prsindia.org/uploads/media//draft/Labour%20Code%20on%20Industrial%20Relations%20Bill%202015.pdf. The Bill also contains several other sections that would weaken trade unions and the dispute settlement process: see Mathew and Jain (2018).

many papers (including some of mine) wrongly assert that none of the restrictions under Chapters V-A and V-B apply to establishments with less than 50 workers. As pointed out above and in Bhattacharjea (2017), this is not true: such establishments are required to give notice and compensation at prescribed rates in case of retrenchment. They are thus subject to 'firing costs', although less than those imposed on larger factories.[21] Second, as earlier pointed out in Bhattacharjea (2009), sections of the IDA as well as some court judgments require that if "functional integrality" or lack of "severability" can be established between distinct units (including non-manufacturing branches) of an industrial establishment, then their employment should be aggregated in order to determine whether it exceeds the thresholds. Therefore, establishments cannot be accurately allocated to employment size classes on the basis of the unit-level ASI data which are used by researchers for this purpose. Third, the ASI reports average daily employment for an accounting year, but the relevant IDA sections that specify the thresholds require calculating average employment over the month (for the layoff provisions of Chapter V-A) or year (for Chapter V-B) immediately preceding the proposed LRC. Thus, the coverage of these chapters cannot be matched accurately with the data.

Is there any alternative to using ASI data to classify establishments by employment? Using data from the 2005 Economic Census, Amirapu and Gechter (2017) show that the employment size distribution reveals a significant discontinuity just below the 10-worker level, which corresponds to threshold of applicability of the Factories Act and several other pro-worker laws that impose additional burdens on establishments, pertaining to workplace safety, employee benefits, and registration and reporting requirements. This suggests that establishments deliberately stay small, or under-report their true employment, to stay below the 10-worker threshold. What is relevant for our purposes is that the authors find no comparable discontinuity at the IDA Chapter V-B threshold of 100 workers, confirming the earlier finding of Hsieh and Olken (2014), which was based on ASI data for 2011.

**2. Contract vs 'Permanent' Workers**

The employment of contract workers as a flexibility-enhancing strategy has independently attracted the attention of some of the more recent researchers. In the context of Indian manufacturing, contract workers are hired through labour contractors or agencies. Because they are not on the rolls of the factory, employment of such workers is not covered by EPL,

[21] However, see n 7 above.

and is flexible by definition. They constitute a growing proportion (now over a third) of the total workers in manufacturing. But the mistake that some authors make is to assume that the rest of the workforce reported in the ASI is comprised entirely of 'permanent' workers. This is incorrect. Block E of the ASI questionnaire schedule requires data on "Workers employed through contractors" and separately on workers employed directly by the establishment (Central Statistics Office, 2016, p.A-19). The corresponding instructions to field staff clearly state: "Block E: items 1 & 2: male & female workers directly employed: Include all persons employed directly (*casual as well as regular*) on payment of wages or salaries…" (ibid, p.35, emphasis added). In order to avail of the EPL chapters of the IDA, workers are defined (in IDA sections 25B and 25S) as those who have worked for at least 240 days in the preceding twelve-month period. This creates an obvious incentive for employers to rotate their directly-employed workforce. Even apart from such casual workers, non-permanent employees could include trainees, probationers, and apprentices,[22] as well as those on fixed-term contracts. Thus, not all non-contract workers (i.e. those who are directly employed) are 'permanent'.

Several studies of particular industries in particular regions, surveyed in Srivastava (2016a, 2016b), have provided evidence of increasing recourse to such forms of employment, creating a cadre of "permanent temps". This has been encouraged by changes in labour jurisprudence at the highest level. Reversing the position it maintained earlier, since about 2000 the Supreme Court has in most cases denied claims by contract and casual workers, sometimes retained in that status for decades, for 'regularization' of their employment. The Supreme Court has also made it easier for firms to employ contract workers and pay them less than directly-employed workers (Gopalakrishnan 2015, Das et al 2017).

The term 'permanent worker' is a misnomer even for the directly-employed 'regular' workers. In factories below the 100 worker threshold of Chapter V-B, they can be retrenched with notice and compensation. Shyam Sundar and Sapkal (2017, p.64) suggest that employers have even been promoting workers to supervisory categories so they remain outside the scope of collective bargaining. They are also excluded from the definition of 'workman' under section 2(s) of the IDA, and cannot therefore avail of its protections. The number of such non-worker employees has been growing much faster than that of directly employed workers in recent years. Moreover, even amongst 'regular' workers in organized manufacturing, a

[22] "Apprentice will be classified as casual employee and Probation employee will be treated as Regular Employee." (Central Statistics Office, 2016, p.A-70)

small and declining share (barely a quarter in 2011-12) have written contracts, without which they would find it hard to prove that they qualify for IDA protection (Sood et al 2014; Srivastava 2016). And thanks to recent legal changes, even formal contracts can now ensure flexibility. As pointed out in Bhattacharjea (2006), section 2(oo)(bb) of the IDA excludes from the definition of retrenchment all cases of non-renewal of an employment contract on its expiry, or under a stipulation contained in the contract. This would disentitle such workers to the protection of the IDA. Courts have usually insisted that the duration of the contract should be linked to a fixed-term project, thereby not allowing this provision to degenerate into a sham whereby workers could be kept on indefinitely by renewing their contracts after short breaks. However, in October 2016, the government notified an amendment to the Industrial Employment (Standing Orders) Act which allowed fixed term contracts in the apparel manufacturing sector, with "all statutory benefits available to permanent workman proportionately accordingly to the period of service rendered by him" (Press Information Bureau 2016). In March 2018, this was extended to all sectors. The effects of this will be observable only over the next several years.

Several developments have thus blurred the distinction between formal and informal (flexible) employment, resulting in a growing industrial 'precariat'. The share of contract workers in the labour force, measured as the proportion hired through labour contractors, is thus a serious underestimate of the extent of flexibility. On this, a recent news report is quite telling:

> Major manufacturing firms axed around 30 per cent of their staff in 2016 with levels of retrenchment expected to reach 40 per cent in 2017, according to the country's largest human resources (HR) services firm-- TeamLease services. In an internal assessment of its over 2,500 corporate clients, the Fortune 500 company has found out that entry-level jobs face the maximum risk as companies continue with their cost cutting measures amid concerns over low growth. (Chakraborty 2017).

This sample comprised corporate firms in manufacturing, who are most likely to operate the larger establishments covered by the more restrictive IDA provisions. One can infer that these firms were able to retrench such a large proportion of their staff either because permission is being readily granted (perhaps by default, as permission is deemed to be granted if the appropriate authority does not respond to the application within 60 days), or the law is not

being enforced, or they had a substantial proportion of employees who were not protected by Chapter V-B.[23]

## VI. LABOUR LAWS AND LABOUR MARKET OUTCOMES

The final issue to which I would like to draw attention is the growing disconnect between the IDA, which as we saw above was very infrequently amended after 1990, and far-reaching developments in the organized manufacturing sector. I had pointed this out in Bhattacharjea (2006); the more recent evidence points unambiguously in the same direction, and (given that this paper is already very long) is best summarized in point form:[24]

a) Employment in organized manufacturing has grown rapidly since 2005, although its elasticity with respect to output growth has fallen.
b) The capital intensity of production has been rising steadily since the mid-1980s; this is mainly due to increasing intensity in each industry rather than a shift in the structure of production in favour of more capital-intensive industries.
c) Factories with more than 100 workers covered by Chapter V-B have exhibited higher growth and variability of employment as compared to smaller factories; the number of factories in the higher employment class sizes (except the 1000+ category) has also increased more rapidly (Roychowdhury 2018a, 2018b).
d) Real wages in organized manufacturing stagnated in the 1990s and decreased in the early 2000s (although they seem to have recovered somewhat in more recent years).
e) There has been a sharp decrease in the share of wages in value-added since the 1980s, as wages lagged behind increases in labour productivity.
f) Even among 'regular' workers with written contracts, a decreasing proportion has social security benefits or union membership.
g) There has been a steady decrease in the incidence of strikes and lockouts since the mid-80s. Contrary to the finding reported by Besley and Burgess (2004, p.99, n.9) for

[23] See Ruthven (2017) for a revealing account of flexible hiring strategies employed by big manufacturing firms in the Delhi region. In my earlier articles, I had discussed several ways in which employers could circumvent restrictions on employment flexibility. Shyam Sundar (2018, pp.121-22) lists no less than eighteen such stratagems. He also nicely summarizes actual and proposed labour law reforms over the last two decades.

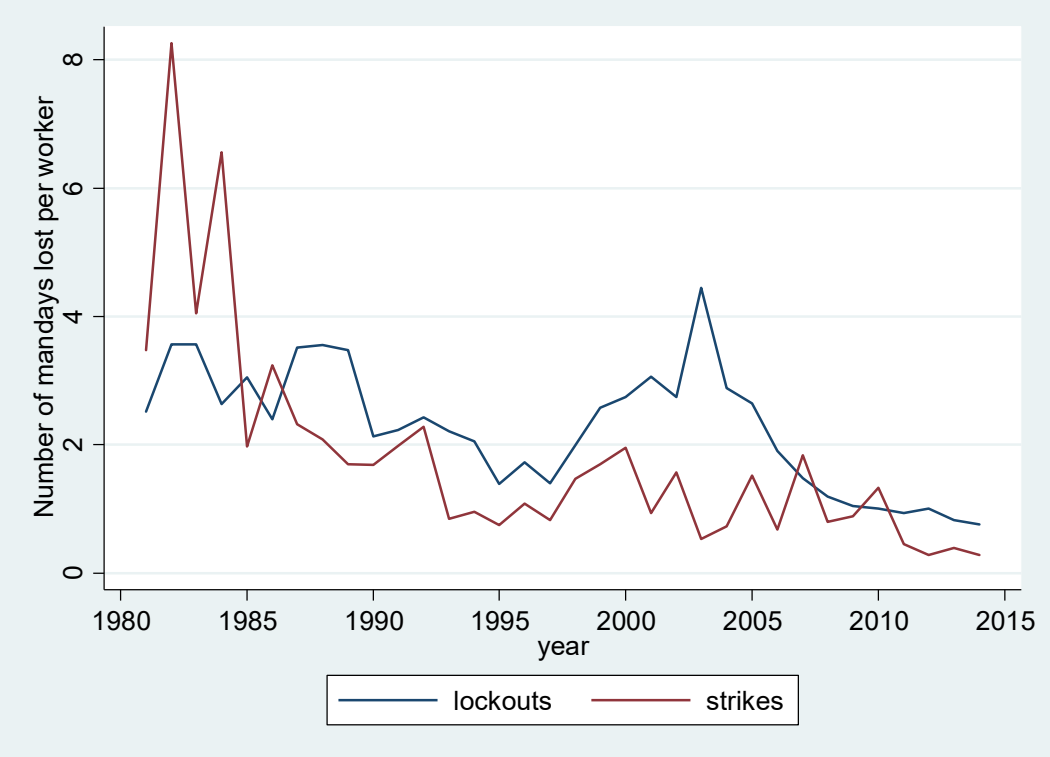
[24] I have drawn upon Sood et al (2014), Sen and Das (2015), Srivastava (2016a, 2016b), Roychowdhury (2018), and Basole et al (2018), which may be consulted for details and alternative explanatory hypotheses.

the 1958-92 period that they covered, far fewer workdays have been lost to strikes as compared to lockouts in almost all years since the mid-1980s (see Fig. 1).

Thus, whether one takes the broader interpretation of labour regulation as enhancing workers' bargaining power or the narrower one concerning labour market flexibility, there have been massive changes in the ground realities, without significant changes in the de jure regulatory framework. These findings constitute a standing reproach to the entire body of literature that seeks to relate the two.

**Figure 1:**

**Number of Mandays Lost on account of Strikes and Lockouts (per worker), 1980-2014**




*Sources:* Calculations based on (a) Strike and lockout data generously provided by Anamitra Roychowdhury, supplemented by Labour Bureau data from www.indiastat.com; (b) Employment data (all-India figures): Annual Survey of Industries, various years, from ICSSR Data Service [distributor] http://www.icssrdataservice.in/index.php.

## VII. CONCLUSIONS

The Besley-Burgess index of inter-state variation in labour regulation has had a charmed life, in two senses. First, used as a regressor, whether in its original form or in the substantially modified forms that later authors created by reclassifying major states or combining it with dissimilar indices, the index has almost always delivered the expected results, across a variety of dependent variables, datasets and time periods. This is an enviable record for such a malleable unit of measurement. Second, as in the children's game of Chinese Whispers, later researchers successively distorted their predecessors' interpretation of the index, so that eventually it came to be characterised as a measure of the degree of legally-mandated job security, which it was not supposed to be. Apart from Teitelbaum (2012), none of the authors whose work has been surveyed here bothered to go back to the actual text of the IDA. Instead, their reinterpretations reinforced the conclusion of the index's creators, that "attempts to redress the balance of power between capital and labour can end up hurting the poor" (Besley and Burgess, 2004, p.124). Thus, the index became truly 'flexible', both its form and its meaning, and also acquired a pejorative connotation for its pro-worker pole.[25]

In this paper, which updates and reinforces my earlier surveys, I have documented the multiple inaccuracies in the construction of the BB index, and its erroneous characterization as an indicator of state-level labour market flexibility. Alternative measures suggested by some authors are beset by the same problems, as well as additional ones. I discussed some basic econometric problems that bedevil this literature: measurement errors, omitted variables, endogeneity, lack of robustness when time trends are included, and faulty use of discrete variables as regressors. A 'corrected' index would show hardly any variation, and would not capture the state of uncertainty that prevailed for over two decades while many of the IDA amendments remained under legal challenge. I also discussed inaccuracies in the way in which some recent studies have tried to establish threshold effects of labour laws, and to distinguish between contractual and permanent workers. In any case, actual labour market outcomes for workers have been deteriorating for three decades without significant changes in labour laws, suggesting that this entire research programme is now irrelevant as a guide to policy. I am currently working on an empirical exercise that can provide a fair test of the

[25] I thank Tista Bagchi for acquainting me with the term *pejoration*, which is used in linguistics to describe this kind of change in meaning. For example, the words *sinister* in Latin and *gauche* in French, both meaning *left*, came to acquire negative connotations in English because of the stereotyping of left-handed people

relevance of the BB classification during this period, while avoiding or at least mitigating the problems discussed in this paper. For the present, I can only conclude, as I did in Bhattacharjea (2009), that there may well be arguments in favour of labour law reform, but this literature reveals more about academic standards than labour standards.[26]

[26] See Storm (2019) for a stronger indictment of the gatekeepers of professional knowledge in economics, based on his own technical critique of Besley and Burgess (2004).

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**Table 1:**

**Summary of major empirical findings on the effects of labour market flexibility**

| *Authors* | *Period Covered and Nature of Industry Data* | *Labour Regulation Variable and Its Interpretation* | *Results on Effects of Labour Regulation* |
|---|---|---|---|
| Besley and Burgess (2004) (**'BB'**) | 1958-92 ASI state panel; 1980-97 ASI 3-digit industry panel | Each amendment classified as pro-worker/pro-employer/neutral, assigned value 1, -1 or 0 respectively; state-year assigned 1, -1 or 0 depending on net direction of change; annual changes cumulated over time for each state to give value in a particular year . | "Pro-worker labor regulation resulted in lower output, employment, investment, and productivity in the formal manufacturing sector. Output in the informal sector increased…. Pro-worker labour regulation is associated with increases in urban poverty" (pp.92-93). |
| Hasan, Mitra, Ramaswamy (2007) (**'HMR'**) | 1980-97 ASI 2-digit industry panel | FLEX dummy = 1 for states classified as pro-employer by BB, 0 otherwise, but classification of Gujarat, Maharashtra and Kerala switched. | States with more flexible labour regulations have higher labour demand elasticities, and show larger increases in these elasticities in response to trade liberalization. *Second result disappeared when original BB classification was used in working paper version (Hasan et al 2003).* |
| Mitra and Ural (2008) | 1988-2000 ASI 2-digit industry panel | HMR FLEX dummy, as above | Greater flexibility increases labour productivity, TFP, employment, and investment; enhances positive effect of trade liberalization on these variables; delicensing raises labour productivity and employment only in flexible states. Trade liberalization raises productivity more in export-oriented industries in flexible states. |
| Hasan, Mitra, Ural (2008) | NSS CES for 1987–88, | 1. *Flex* dummy = 1 for states classified as pro- | "reductions in tariff rates over the 1990s were |

| | | | |
|---|---|---|---|
| | 1993–94, and 1999–2000. | employer by BB, 0 otherwise<br>2. *Flex2* identical to FLEX dummy in HMR (2007) | associated with a 15 percent decline in urban poverty in states with flexible labor market institutions relative to other states" (p.109). |
| Aghion et al (2008) | 1980-97 ASI 3-digit industry panel | Unmodified BB index | Pro-employer labour regulation associated with higher output, and higher output response to delicensing. *Labour regulation does not modify the effects of trade or FDI liberalization.* |
| Ahsan and Pagés (2009) (**'AP'**) | 1959-97 ASI 2-digit industry panel | 1. Separate indices for amendments relating to dispute settlement legislation (DL) and employment protection legislation (EPL), with coding as in BB.<br>2. As above, with recoding based on Bhattacharjea (2006). | Both DL and EPL amendments negatively related to employment and output, and reinforce each other. |
| Dougherty (2009) | 1998-2004 ASI industry-level pseudo-panel | **OECD** index, as described in section II.7 of this paper. | States that have undertaken more labour regulation reforms show greater employment flexibility in the form of inter-industry job flows. |
| Gupta et al (2009) (**'GHK'**) | 1980-2004 ASI 3-digit industry panel | Classification into pro-worker/inflexible, neutral, and pro-employer/flexible, creating Labour Market Regulation variable with values -1, 0, +1, based on majority rule over:<br>1. Classification based on BB average score for 1980-97 with two states reclassified.<br>2. Reclassification of BB based on Bhattacharjea (2008).<br>3. Classification based on OECD index. | "States with relatively inflexible labor regulations have experienced slower growth of labor-intensive industries and slower employment growth" after delicensing (pp.62, 95). |

| | | | |
|---|---|---|---|
| Fagernäs (2010) | 1983-99 EUS pseudo-panel over four different years | 1. Cumulative value of scores based on reclassification of IDA amendments as described in n.4.<br>2. Pro-worker share of awards by labour courts and tribunals. | *"No clear relationship between the degree of formal employment and labour regulation or the dispute settlement process"* (p.285). |
| Topalova (2010) | 1983-99 CES four repeated district-level cross sections | Indicator variable = 1 if state has flexible/pro-employer labour law as of 1991 according to BB. | Tariff reductions increased poverty rates and reduced per capita consumption "predominantly in states with less flexible labour laws… tariff cuts had no impact on poverty and consumption in states with flexible labour laws" (p.31) |
| Topalova and Khandelwal (2011) | 1989-1996 Prowess firm-level panel | Separate regressions for pro-employer and (pro-worker+neutral) states classified according to BB. | *Effect of tariff reduction on firm productivity stronger in pro-worker/neutral states* |
| Teitelbaum (2012) | 1960-97 ASI state panel;<br>1973-97 ASI industry panel | BB amendments reclassified as<br>1. IDL: Those facilitating greater judicial or government intervention in industrial disputes (similar to AP, but not proworker/employer).<br>2. EPL with modifications based on Bhattacharjea (2006).<br>Also industry level public utility dummy | *IDL positively associated with investment/ capita, K/L, value added per capita and per worker.*<br>EPL negatively related to these variables at industry level, but "this effect is being driven by a small volume of amendments passed in a handful of states" (p.135).<br>Declaring an industry a public utility, especially at the central level, has very damaging consequences. |
| Goldar and Aggarwal (2012) | 2004-5 EUS cross section of individual workers in manufacturing | OECD index | "Labour market reforms tend to increase the creation of regular jobs" (Abstract) |
| Hasan et al (2012) | 1987-2005 EUS, four repeated cross-sections for different years. | FLEX dummies based on:<br>FLEX1: BB classification updated to 2004<br>FLEX2: BB with HMR reclassification | "We find that trade liberalization has an unemployment reducing effect in states with flexible labor markets…. In addition to the state-level findings, we also find that workers in |

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| | | FLEX3: GHK classification | industries experiencing greater trade liberalization were less likely to become unemployed, especially in states with flexible labor regulations and net export industries" (p.279). |
| Adhvaryu et al (2013) | 1. ASI District level repeated cross-sections for 1987, 1990, 1994.<br>2. ASI 3-digit industry panel, 1980-97. | Dummies for pro-employer and pro-worker for each year based on:<br>1. BB classification as of 1988 with Karnataka switched from neutral to pro-employer in 1987<br>2. AP classification with "Bhattacharjea recoding"<br>3. AP classification of DL amendments (their classification of EPL amendments has no pro-employer states) . | Local demand shocks affect rural manufacturing employment more in pro-employer states, in firms with >100 workers, and primary product based industries. |
| Hasan and Jandoc (2013) in Bhagwati-Panagariya | 1994-2005, ASI and NSS Survey of Unorganized Manufacturing Enterprises; repeated cross sections for three different years | "We use the GHK composite index to categorize states in terms of whether their labor regulations are flexible or inflexible" (p.35). | In labour-intensive industries, "states with more flexible (inflexible) labor regulations tend to have a greater share of employment in larger (smaller) firms. Moreover, this is more evident among firm established after 1982" (p.42) |
| Sundaram, Ahsan, Mitra (2013) in Bhagwati-Panagariya | 1989-2001, ASI, NSS Survey of Unorganized Manufacturing Enterprises, and CMIE Prowess; repeated cross sections for three different years. | Dummy to distinguish 5 "pro-employer or flexible labour market states" (p.56), as identified by GHK. | Responsiveness of informal sector to formal sector employment is slightly higher in flexible states; "formal sector outsourcing has a positive effect on informal sector activity [employment and output] in flexible labour market states" (p.67). |
| Goldberg et al (2013) in Bhagwati-Panagariya | 1989-2003 CMIE Prowess firm-level panel | Dummies for proworker and neutral states identified by BB. | Firms in neutral or proworker states less likely to add products in response to reduction in input tariffs, but estimates are imprecise. |

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|---|---|---|---|
| Harrison et al (2013) | 1985-94 and 1998-2004, ASI plant-level panel | 1. Pro-worker and pro-employer dummies based on BB scores as of 1985.<br>2. Dummy for states that granted above-median proportion of requests for layoff and closure. | *Labour regulation does not modify the effects of delicensing or trade reforms on TFP. FDI reform increases TFP more "in states where it is difficult to lay off workers"* (p.220). |
| Rodgers and Menon (2013) | 1983-2004 EUS for 5 years | Cumulated score in each year for EPL, DL and V-B amendments separately, based on AP. Changes referred to as pro-worker and pro-employer. | *Pro-worker EPL and DL amendments improved job quality (job security, likelihood of full-time work and cash wages) for women*, but last two worsened for men. Wages much higher for both. Similar results for Ch.V-B, except no impact on women's wages. |
| Saha et al (2013) | 1998-2005 ASI 3-digit industry panel | 3 state-level measures of workers' bargaining power:<br>1. Lockout/strike ratio,<br>2. BB index scores as of 1997,<br>3. OECD index of strength of union rules. | "Industries in more pro-worker states more inclined to use contract labour with greater import penetration and less inclined to use contract labour with greater export orientation" (p.193). |
| Dougherty et al (2014) | 1998-2008 ASI plant-level panel | 1. 'Flexible EPL' dummy based on above-median values of OECD index.<br>2. 'Neutral' and 'Flexible' EPL dummies based on BB and GHK classifications, updated to 2009. | OECD: Firms in more L-intensive and volatile industries exhibit higher TFP in flexible states. *No differential effect at employment thresholds of 50 or 100 workers; flexibility has a negative effect on TFP in plants with >250 workers.*<br>GHK: result for L-intensive industries is robust.<br>*BB: insignificant or wrong sign.* |
| Ghani et al (2014) | 2005-06 ASI + NSS 3-digit industry-level cross section | 'Labour regulations index', based on AP. | Employment entry rates (percentage of employment in firms less than 3 years old) are negatively related to 'stringency of labour laws', *but this effect is confined to establishments with < 100 workers* (Table 4). |

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| Chaurey (2015) | 1998-2008 ASI plant-level panel | Pro-worker and pro-employer dummies based on<br>1. BB classification<br>2. GHK classification | Firms in pro-worker states differentially hire more contract workers (but not 'permanent' workers) in response to local demand shocks. The effect is stronger for firms with more than 50 workers. |
| Ramaswamy (2015) | 1998-2008 ASI plant-level panel. | Time-invariant classification (flexible/ inflexible/others) based on BB modified in light of AB, updated to 2008, with more states included. But econometric analysis uses an inflexibility dummy. | Share of contract/total workers is higher in size-class 50-99 workers, especially in labour-intensive industries in inflexible states. |
| Sofi and Sharma (2015a) | 1999-2008 ASI 2-digit industry panel. | Time-invariant 'EPL Index' with values 1, -1 and 0 for rigid, flexible and neutral states, based on GHK classification updated to 2008, with two states reclassified. | Share of contract/total workers is positively related to EPL, ratio of strikes to lockouts, and industry output volatility. |
| Sofi and Sharma (2015b) | As above | As above | EPL does not affect TFP after controlling for share of contract workers. |
| Sofi and Sharma (2015c) | As above | Same index as above, but called 'Labour Market Rigidity Index' (LMR). | Ratio of 'permanent' to contract workers is positively related to labour productivity, but not after controlling for LMR. LMR negatively effects employment, especially in labour-intensive industries. |
| Kapoor (2016) | 1999-2011 ASI 3-digit industry panel | Time-invariant 'Labour Market Regulations' measure with values 1, 0 and -1 for flexible, neutral and inflexible states, based on<br>1. GHK classification.<br>2. OECD classification | States with more flexible labour markets show higher growth in manufacturing value added and employment, *but no difference as between labour and capital intensive industries.* Increase in share of contract labour is higher in inflexible as compared to flexible states. |
| Sapkal (2016) | 2000-07 ASI | 'EPL index' and dummy variables for pro-worker | Firms in stricter EPL states hire differentially larger |

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| | 3-digit industry panel. | and pro-employer states, based on cumulative BB scores, updated to 2008 | share of contract workers, especially in states with stricter 'enforcement' (number of labour inspectors per thousand workers). |
| Ahsan et al (2017) | 1993-2005 NSS EUS cross sections for 3 years. | GHK classification | "the impact of tariff liberalization on deunionization in net-import industries was attenuated in states with flexible labour markets" (p.413) |
| Goldar and Suresh (2017) | 2010-11 ASI 2-digit industry cross section | 1. BB index ("which reflects the extent of rigidity", p.374)<br>2. Dummy variable to distinguish states with more flexible labour market.<br>3. State scores on Economic Freedom Index<br>4. OECD index and its components | Only OECD index *(but not its IDA component)* is significant in explaining ratio of contract/total workers. *"The results do not provide empirical support to the view that the use of contract workers is primarily attributable to labour market rigidities"* (p.374). |
| Hasan et al (2017) | 2001, 2005, 2010 ASI + NSS enterprise surveys. Three repeated enterprise-level cross sections (apparel sector only) | 1. For regressions: Time-invariant 'Labour Regulation' variable with values 1, -1 and 0 for states with flexible, inflexible and neutral labour regulations.<br>2. For comparing state averages: Partition into flexible/ inflexible (neutral treated as inflexible).<br>(Both based on GHK partition) | States with flexible labour regulations have:<br>1. A larger share of employment in the formal sector.<br>2. A lower ratio of contract to regular workers.<br>3. A lower share of workers with wages below state poverty line. |
| Harrison et al (2017) | 2000-07 ASI district x plant-level panel | Dummy representing pro-employer states, based on BB classification at the end of the period studied by them. | *Increases in organized sector employment, output, wages and labour productivity were not significantly different across different categories of states* (Table 8). *Increased employment associated with removal of product reservation for* |

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| | | | *small-scale industries "is driven by labor expansion in states that were not pro-employer"* (p.377). |
| Ayyagari et al (2017) | 2001-10 ASI plant-level panel | "Flexible state" dummy, based on GHK classification | Flexible states have higher entry rates, but *growth rates of small and large entrants are not significantly different across different labour market regimes. Entrants in inflexible states are larger and have higher initial TFP*, "presumably to be able to overcome … regulatory obstacles" (p.2516). |
| Ahluwalia et al (2018) | ASI 1998-2008 plant-level panel | 1. GHK index<br>2. New time-invariant index obtained by further modifying GHK as regards Ch.V-B in light of Bhattacharjea (2009) and Dougherty (2009), with authors' own adjustments. | Abolition of MFA export quotas is associated with larger increases in employment and wages in apparel and textile industries in states with flexible labour regulations as compared to states with inflexible regulations. |
| Kukreja and Bathla (2018) | ASI 2001-2014, state level panel for Textile and Clothing industry only | FLEX dummy as in HMR (2007) | Employment of contract workers in factories employing <100 workers has risen faster than in larger factories; "states with flexible labour markets tend to have higher employment levels compared to states with inflexible labour markets". |
| Sofi and Kunroo (2018) | 2000-2012 Labour Bureau State panel (for labour turnover measures) | Time-invariant 'EPL Index', with values 1, -1 and 0 for rigid, flexible and neutral states. Classification based on<br>1. GHK classification<br>2. OECD index | GHK: High EPL states have lower labour turnover and separation rates, but *these states do not show significantly different response to local demand shocks.*<br>OECD: *Turnover and separation rates show significantly higher response to demand shocks in high EPL states*. |

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| Kapoor and Krishnapriya (2019) | 2000-2016<br>ASI plant level panel | GHK Labour Market Regulation Index | Plants in states with less flexible labour regulations have a higher share of contract workers, except in small plants and labour-intensive industries. |
| Karak and Basu (2019) | 1969-2005<br>ASI state panel | Original BB index | *Coefficient on BB index in the baseline BB regression becomes insignificant when profit rate of industries in a state is included as a regressor along with more controls and state-specific time trends.* |
| Maiti (2019) | 1998-2014<br>ASI 3-digit industry panel | 'Flex' dummy = 1 for states classified as pro-employer or neutral by BB, 0 otherwise | *Solow residual (proxy for productivity) is lower in flexible states due to higher bargaining power of labour. Effect of trade liberalization is not significantly different as between flexible and inflexible states.* |
| Storm (2019) | 1960-92<br>ASI state panel | Original BB index | *Negative coefficient on BB index in the baseline BB regression becomes much smaller when dataset is supplemented from an alternative source; becomes insignificant when West Bengal is excluded; becomes positive when state specific time trends are included; and becomes insignificant when estimated over different time periods.* |

**NOTES:**

1. Data descriptions pertain only to data used for the main dependent variables.
2. Summaries of results pertain only to those concerning the effects of labour regulation.
3. Results in *italics* are those that are contrary to expectations or to earlier studies.
4. Key papers whose state classifications were used or modified by later authors are given abbreviations in **bold** for easy cross-referencing.

**Abbreviations:**

ASI: Annual Survey of Industries

CES: Consumer Expenditure Survey
CMIE: Centre for Monitoring the Indian Economy
EUS: Employment-Unemployment Survey
NSSO: National Sample Survey Office

**Table 2: Correction of Besley and Burgess (2004) Coding of State Amendments to Chapter V-B of the Industrial Disputes Act**

| *State and Year* | *IDA Section* | *Description in Besley and Burgess (2004), Appendix 2* | *Besley - Burgess Coding* | *Problem with Besley-Burgess coding* | *Correct Coding* |
|---|---|---|---|---|---|
| Karnataka 1988 | 25K | Extends rules for layoffs, retrenchment, and closure to smaller firms | 1 | Applies only to closure of firms with seasonal activities, but with the same employment threshold as the central Act | 1 |
| Madhya Pradesh 1983 | 25O | Applies closure rules to previously uncovered undertakings | 1 | Extends coverage to undertakings dealing with construction activities—irrelevant for manufacturing | 0 |
| Maharashtra 1981 | 25K | Extends rules for layoffs, retrenchment, and closure to smaller firms | 1 | Central act amended similarly, effective 1984. | 1* |
| Maharashtra 1983 (?) | 25O | Gives power of appeal to workers to overturn decision to close down firm | 1 | (a) Gave power to *both* workers and employers to appeal against a decision granting *or* denying permission for closure.<br>(b) Amendment actually took effect in 1981. | 0 |
| Orissa 1983 | 25K | Extends rules for layoffs, retrenchment, and closure to smaller firms | 1 | Central act amended similarly, effective 1984. | 1* |
| Orissa 1983 | 25O | Gives power of appeal to workers to overturn decision to close down firm | 1 | Gave power to *both* workers and employers to appeal against a decision granting *or* denying permission for closure, exactly as in central Act. | 0 |
| Rajasthan 1984 | 25K | Extends rules for layoffs, retrenchment, and closure to smaller firms | 1 | Central act amended similarly, effective 1984. | 1* |
| Rajasthan 1984 | 25M | Can continue layoffs due to natural disasters | -1 | (a) Applicable only to mining activities | 0 |

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| | | for more than 30 days without permission | | (b) Superseded a few months later by central amendment | |
| Rajasthan 1984 | 25N | Union representatives have to be involved in any negotiations concerning retrenchment of workers. Their involvement is not stipulated under the central act | 1 | Superseded a few months later by central amendment, which requires giving an opportunity of being heard also to "the persons interested in such retrenchment" | 1* |
| Rajasthan 1984 | 25O | Applies closure rules to previously uncovered undertakings | 1 | Extends coverage to undertakings dealing with construction activities—irrelevant for manufacturing | 0 |
| Rajasthan 1984 | 25Q | Increases penalty for unauthorized layoff and retrenchment of workers | 1 | None | 1 |
| Rajasthan 1984 | 25S | Extends rules for layoffs, retrenchment, and closure to smaller firms | 1 | Same mistake as in regard to 25K. Effectively no different from central act | 1* |
| West Bengal 1980 | 25K | Extends rules for layoffs, retrenchment, and closure to smaller firms | 1 | Superseded in 1984 by central amendment | 1* |
| West Bengal 1980 | 25M | Extends period after which employer can commence layoffs | 1 | Superseded in 1984 by central amendment | 1* |
| West Bengal 1989 | 25O | Employers have to demonstrate ability to pay compensation before closing down firm | 1 | None | 1 |

* State amendment would have had a transient differential effect until a similar or overriding change was made by a central amendment with effect from 1984.