INDIAN LABOUR LAW AND ITS IMPACT ON UNEMPLOYMENT, 1970-2006: A LEXIMETRIC STUDY

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Abstract

We analyse a recently developed leximetric dataset on Indian labour law over the period 1970 to 2006. Indian labour law is seen to be highly protective of workers' interests by international standards, particularly in the area of dismissal regulation. We undertake a time-series econometric analysis to estimate the impact of the strengthening of labour laws on unemployment and industrial output in the formal economy. We find no evidence that pro-worker labour legislation leads to unemployment or industrial stagnation. Rather, pro-worker labour laws are associated with low unemployment, with the direction of causality running from unemployment and output to labour regulation.

Keywords: labour law, unemployment, India

JEL Codes: K31, J08, J50, J60, J83

1. Introduction

The regulation of the labour market with a view to protecting the interests of workers is conventionally taken to be an exogenous interference with the workings of the market mechanism, which leads to a range of distortions and inefficiencies, including higher unemployment. Thus, as the World Bank's *Doing Business* report has put it, 'laws created to protect workers often hurt them' (World Bank, 2008: 19). In the case of developing countries, it has been claimed in a number of heavily-cited studies that strong labour laws lead to reduced employment in the formal sector and a higher level of labour informality, as firms take steps to avoid the impact of regulatory legislation (Fallon and Lucas, 1993; Heckman and Pagés, 2004; Besley and Burgess, 2004; Botero et al., 2004). India's experience is a critical one for this hypothesis. India has long had labour laws which, by the standards of developed and developing countries alike, are at the more protective end of the spectrum, and which have been periodically strengthened. Besley and Burgess (2004) took advantage of differences in the level of labour law protection across different Indian states to study the impact of variations in legal regulation on levels of investment and employment in manufacturing. Their analysis found evidence of the adoption of pro-worker labour laws leading to a drop in employment in the organised manufacturing sector and an increase in the size of the informal sector in the states concerned. The Besley-Burgess paper has had a sizable influence on research and policy, having been cited several hundred times in academic papers, and in a number of policy documents discussing labour law reform in India (see, in particular, Ministry of Finance, 2006). Later studies have questioned the methodology employed by Besley and Burgess to measure the impact of legal change and the econometric techniques they used to estimate the economic impact of law reforms (for reviews, see Jha and Golder, 2008; D'Souza, 2010). Whatever view is taken of the methodological standing of the Besley-Burgess paper, a major limitation of their analysis is that it stops in 1992, around the start of the period of major institutional reforms in India which presaged its more recent period of economic growth, and so is of limited assistance in understanding this phase of India's economic and industrial development. It is noteworthy that throughout this period, notwithstanding other legal and regulatory reforms, the fundamentals of Indian labour law did not change, at least at the level of the formal law or *de jure* regulation. The continuity of *de jure* labour regulation across periods characterised by otherwise very different approaches to economic governance and contrasting experiences of economic growth poses the question of whether the negative view ascribed to Indian labour laws in the wake of the Besley-Burgess study is truly merited.

In this paper we analyse the impact of labour regulation on unemployment using a recently developed dataset which provides a time series of changes in Indian

labour law from the early 1970s to the mid-2000s, spanning the period from the height of the 'license Raj' to the market-orientated economic reforms of the 1990s and 2000s (Deakin, Lele and Siems, 2007). The dataset uses 'leximetric' techniques to code legal changes in a way which addresses some of the methodological problems involved in quantifying legal and institutional phenomena. We combine this new data source with econometric methods, based on vector error correction analysis, which seek to address the problem of untangling cause and effect in long time series and controlling for the multi-dimensional character of law-economy interactions over time. Our approach, as it makes us of comparable cross-national data on legal change, also makes it possible to put the Indian experience of labour regulation in a comparative perspective.

Section 2 briefly sets out the main lines of the debate on the economic effects of labour laws and reviews the main contributions to the study of the Indian case. Section 3 introduces the dataset on which we rely for our legal analysis and explains the methodology behind its construction, contrasting it with those of other attempts to construct legal indices. Section 4 presents our time series analysis. We find no evidence of pro-worker labour laws leading to unemployment or industrial stagnation. There is, however, evidence of unemployment and industrial output influencing both the short-run and long-run evolutionary path of labour law. In other words, our analysis implies that, in the case of India, the direction of causation has run from the economy to the legal system rather than vice versa. In section 5 we offer some concluding thoughts and suggestions for future research in this emerging area of legal and economic analysis.

2. Theory and evidence on the economic effects of labour legislation: an overview

The claim that labour regulation imposes costs on firms and distorts market outcomes, resulting in growing unemployment and an increase in the size of the informal sector, has influenced World Bank policy for much of the past two decades, and has been influential at national level in a number of countries. The theoretical foundation for this view is that labour regulations artificially raise the costs to firms of taking on workers. As Besley and Burgess put it (2004: 101), 'labor regulation will typically create adjustment costs in hiring and firing labor and in making adjustments in the organization of production'. In the first instance, firms will respond to regulation by substituting capital for labour. More generally, depending on the nature of the regulatory framework, there will be a shift in production from the formal sector to unregulated areas of the economy. This will occur, for example, where labour laws do not apply to firms employing workers below a certain size threshold, or only to certain

industries or occupations, as is the case in India and many other emerging markets. Besley and Burgess add a second possible impact of labour laws: 'by increasing the bargaining power of workers, labor regulation can increase the importance of holdup problems in investment' (Besley and Burgess, 2004: 102). Particularly in a developing country context, this implies that strong labour laws will deter investment, as firms and investors worry that workers will expropriate a greater part of the returns ex post. In this sense, labour laws are akin to weak property rights which discourage productive activity.

An alternative view would be that labour markets, in developed and developing countries alike, suffer from imperfections in the form of asymmetric information (Greenwald and Stiglitz, 1986) and incomplete contracting (Williamson, Wachter and Harris, 1975). Labour laws are, in principle, capable of operating as 'beneficial constraints' (Streeck, 2004), which mitigate the effects of these externalities and high transaction costs, thereby enhancing aggregate efficiency and welfare. For example, laws setting basic labour standards in the areas of pay and working time and providing employees with protection against arbitrary discipline or dismissal may encourage firms and workers to co-invest in firm specific skills and complementary productive assets (Sengenberger and Campbell, 1994). Legislation mandating collective employee representation in the workplace can help raise worker commitment and morale (Rogers and Streeck, 1995). Laws underpinning the bargaining power of employees, such as minimum wage laws and legislation protecting the right to strike in defence of terms and conditions of employment, may help foster local demand for goods and services, assisting the growth of indigenous industries and smoothing out the effects of the economic cycle (Kaufman, 2009). These potentially beneficial impacts are part of wider set of human developmental functions which labour laws may perform, including providing protection against labour market hazards for those unable to obtain private insurance, enhancing the economic opportunities of groups subject to social discrimination and exclusion, and fostering worker voice in the workplace and in economic decision making (Deakin, 2011b).

To point out the potential efficiency-enhancing effects of labour legislation is not to claim that laws of this kind always or necessarily have beneficial impacts; legal interventions may have a number of offsetting positive and negative effects, and even where they lead to aggregate welfare improvements, may have differential wealth effects, leading to losses for particular worker and employer groups. To posit, however, that labour laws are necessarily harmful to economic welfare, is to focus on just one set of their possible effects. Under conditions of incomplete contracting, the *absence* of protective labour laws is as likely to inhibit investment in skills and competencies of workers and encourage

'expropriation' by investors, as their presence is likely to induce the converse effects considered by Besley and Burgess (2004).

Empirical studies of the effects of labour laws have not produced a clear conclusion on whether the potentially negative effects of labour regulation prevail over the potentially positive ones (see Deakin and Sarkar, 2008: 459-462 for an overview). In the context of OECD countries, for example, the evidence that EPL causes unemployment to rise is weak (Baker at el., 2004). There is some evidence that protective laws on dismissal may stabilise employment levels at the cost of increasing unemployment duration, but no clear conclusion on whether they reduce mobility of workers across firms and industries (Bertola, 2008). Beneficial impacts of EPL on firm-level productivity and innovation have been reported in studies which suggest that such positive effects are likely to depend on the presence of complementary institutions such as stable corporate governance arrangements and competitive product markets (Amable et al., 2005, 2007; Koeniger, 2005; Gatti, 2010; Acharya et al., 2010). If evidence on the efficiency effects of labour laws in industrialised countries is perhaps somewhat equivocal, there is 'overwhelming' evidence that labour market institutions, in particular those which support collective bargaining, reduce earnings inequality (Freeman, 2005).

In the context of the developing world, a small number of influential studies have helped to popularise a negative view of the economic impact of labour regulation, with the focus often on the Indian case. Fallon and Lucas (1993) analysed the impact of labour legislation in India and Zimbabwe in the period from the early 1960s to the mid-1980s, reporting, in each case, evidence of reduced labour demand from the enactment of worker-protective laws. In the Indian case, however, their findings turned on averaging otherwise highly diverse cross-industry effects of legal change; when the impacts were broken down by industry, the results were not statistically significant (Bhalotra, 1998).

Besley and Burgess's analysis (2004) was based on an index of changes in state-level labour laws in India. They identified 113 state-level amendments or modifications of national laws in the period between 1958 and 1992, which they coded as either pro-worker (+1), neutral (0), or pro-employer (-1). Where more than one amendment to the law took place in the same year, the effects of the laws were aggregated and given a value based on the presumed overall direction of legal change. On this basis, a regulatory measure of the pro-worker orientation of the law was derived for each state, with the scores for different years being cumulated. The resulting scores were then regressed against state-level data on employment and output in manufacturing. A panel-data econometric analysis found that pro-worker laws were associated with a reduction of both investment and employment in firms in the organised

manufacturing sector, and with a growth in the size of the informal sector consisting of firms employing fewer than 10 workers, to which the laws were mostly inapplicable. The analysis also appeared to show that pro-worker legislation was correlated with an increase in urban poverty, which was associated with the growth of informal employment.

A growing consensus around the negative effects of labour laws in developing country contexts received further confirmation from cross-national studies around the same time. The most influential, that of Botero et al. (2004), was part-funded by the World Bank and went on to inform the methodology of the Bank's *Doing Business* Reports in the mid- to late-2000s (World Bank, various years). Botero et al. based their analysis on an index of labour regulation consisting of around 60 individual indicators, covering a full range of labour law rules, including laws on the employment relationship, collective labour relations, and social security. Their index covered 85 countries and coded for their laws as they stood in the late 1990s. The econometric analysis carried out by Botero et al. (2004) found that higher scores on the labour index were correlated with lower male employment, higher youth unemployment, and a larger informal sector. They also reported that developing countries were characterised by a level of *de jure* regulation of the employment relationship that was at least as high, and in many cases higher, than that in developed countries.

3. Measuring labour law: the methodology of index construction

3.1 Analysis of cross-state variation in the Indian case: potential and limits

The findings of Besley and Burgess (2004) and Botero et al. (2004) depend critically on the validity of the underlying legal data they used and the appropriateness of the econometric methods they employed to analyse those data. The construction of indicators of legal and institutional variables has been driven over the past two decades by the concerns of international agencies and national governments for reliable data on the effects of policies and mechanisms in a number of contexts, including the labour market (Davis et al., 2010; Perry-Kessaris, 2011). The process of creating a legal index inevitably involves the reduction of a complex social reality, consisting of rules whose meaning is frequently incomplete and contested and whose effects are mediated through the strategic interactions of the agents to whom they are addressed, to a series of scalar values which can appear to be, at best, a crude representation of that reality. Indices can be judged against a number of criteria, including clarity of coding, consistency, and verifiability. The index developed by Besley and Burgess, in its use of binary codings (-1, 0 and 1) to indicate how far a given law protected worker interests, scores highly on clarity, and its use of a single

legal source (Malik, 1997) to code discrete legal events (changes in the law) enhances the external validity or verifiability of the coding process. The index is less successful from the point of view of internal consistency. The aggregation of legal changes occurring in a given year into a single score for the state in question in that year produces the odd effect that some states have higher scores than others simply because they effected the changes in question over several years rather than just one (Bhattacharjea, 2006). More generally, the use of binary variables, while transparent, is arguably too reductive in this case to produce internally consistent codings. Labour laws might be expected to vary considerably in their relative importance as regulatory interventions, so coding them in a way which accords all worker-protective reforms the same weight, for example, could introduce a degree of distortion into the scoring of the relevant rules.

As Bhattacharjea (2006) has shown, the Besley-Burgess index contains a number of apparent coding errors as well as the structural inconsistencies just referred to. However, it can be assumed that all legal indices are subject to a degree of error, since lawyers may disagree on the meaning of a given rule (although that does not seem to be the case here, where more straightforward misinterpretations appear to have been made). Similarly, the reduction of legal rules to a series of numerical values will inevitably involve a simplification of the institutional phenomena concerned. Neither errors nor simplification need imply systematic bias in the construction of an index. The Besley-Burgess index may be effective for the purpose for which it was intended, namely facilitating econometric analysis of the effects of legal change, if statistical techniques make it possible to take account of possible shortcomings in the legal data. As Bhattacharjea (2006) points out, the presence of measurement errors in the kind of panel data regression used by Besley and Burgess would be likely to bias the coefficients in the regression equation towards zero, so their finding of correlations between the legal and economic variables is, if anything, even stronger evidence in favour of the impact of the legislation than it would otherwise be. This point would not save the index if it were affected by systematic biases, but a plausible case can be made for the index accurately capturing the overall trends in the pro-worker (or, as the case may, pro-employer) movement of the laws of the states in question (Bhattacharjea, 2006, 2009). Analysis of an amended version of the Besley-Burgess index, which incorporates some of Bhattacharjea's points, has produced similar results, in terms of the negative impact of protective labour legislation on manufacturing employment, to those in the original study (Ahsan and Pagés, 2009).

A more fundamental problem for the Besley-Burgess index (and for the amended version produced by Ahsan and Pagés, 2009) is its lack of relevance. To be useful, an index must contain information which is relevant to the task at

hand. The task Besley and Burgess set themselves was to 'study the role of labor market regulation in explaining manufacturing performance in Indian states between 1958 and 1992' (Besley and Burgess, 2004: 91); their results, they argued, left 'little doubt that regulation of labor disputes in India has had quantitatively significant effects' (Besley and Burgess, 2004: 124). The problem here is that the Besley-Burgess index does not measure labour regulation in any meaningful sense. As a number of later analyses have pointed out (Anant et al., 2005; Bhattacharjea, 2006; Jha and Golder, 2008; D'Souza, 2010), the changes in the law that Besley and Burgess record cannot be equated with a quantitative change in the regulatory environment affecting manufacturing firms. This is for various reasons, including legal uncertainty stemming from serial constitutional challenges to the principle of regulation of dismissal over the period in question, to the widely-reported ineffectiveness of the law in practice, even within the formal sector to which it was intended to apply (Bhattacharjea, 2009).

The gap between formal law or *de jure* regulation, on the one hand, and the effectiveness of laws in practice or *de facto* regulation, on the other, is liable to be significant in the case of labour law rules in whatever national or regional context is being considered, but finding a way to take due account of the gap in empirical studies of the operation of laws is not straightforward. One method is to supplement data on the content of formal legal rules with data from surveys and fieldwork research on respect for the law and enforcement of legal rules among a given population of actors. To this end, Fagernäs (2010) collated data on court efficiency and pro-worker legal rulings in different Indian states, and coded them alongside the changes in state-level laws which Besley and Burgess (2004) focus on. Her analysis found no correlation between the resulting, composite *de jure* and *de facto* measures of the pro-worker orientation of state laws, and the extent of formal employment in either manufacturing or services, across the states concerned.

When the importance of the distinction between *de jure* and *de facto* law is taken into account, the nature of the empirical results arrived at by Besley and Burgess can be put into perspective. Their index, while arguably not very accurately measuring differences in the regulatory environment across Indian states, can nevertheless be thought of as capturing other significant aspects of the political-institutional context of the industrial relations systems of the states. The measure of how far a given state enacted pro-worker labour laws within the framework set by national legislation is possibly a good proxy for pro-labour sentiment in the political system of that state, and, a further remove, of the power and influence of worker interests. Thus what the Besley-Burgess study has unearthed is not the effect of regulation as such, but the impact of wider political and social forces of which *de jure* regulation is a manifestation. The

abstract to their paper expresses this more modest hypothesis more clearly than parts of the text itself, in referring to the issue to be addressed as 'whether the *industrial relations climate* in Indian states has affected the pattern of manufacturing growth in the period 1958-1992' (emphasis added) (Besley and Burgess, 2004: 91).

3.2 Indian labour law in comparative perspective

The papers we have been discussing so far have all focused on cross-state differences arising from the existence, in the Indian case, of concurrent national and state-level competencies in the labour law field. While these cross-state differences are far from insignificant, and provide an opportunity to study the effects of a 'natural experiment' in legal change across broadly similar (although by no means identical) sub-units of a larger jurisdictional space, they by no means provide the only relevant focus for understanding the economic effects of labour legislation in India. This is because the extent of state-level variation around the norm set by the national legislation is comparatively trivial when compared to the substantial alterations made by the national law to the position that would otherwise prevail under the common law governing employment and labour relations. To take the most salient example, Chapter VB of the Industrial Disputes Act 1947 ('IDA'), as amended in 1976, provides that government permission is required for 'retrenchments' (that is, economic dismissals or 'redundancies') in establishments employing 300 or more employees (lowered to 100 in 1982, with effect from 1984). This is, unquestionably, a strict and, by international standards, somewhat unusual restraint on the common-law power of the employer to terminate the employment contract at will (that is, on minimal notice and without good cause or a justifying reason). The state-level laws reviewed by Besley and Burgess (2004) mostly consist of alterations to the coverage of Chapter VB and related provisions, and modifications of relevant procedures and remedies. In no case did a state-level law alter the substantive core of the rules governing authorisation of retrenchments contained in the national law. In several cases, state-level initiatives were introduced to clarify the effects of the IDA during periods when its constitutionality was in doubt (see Bhattacharjea, 2006 for details). The limited role of the states in modifying national law is understandable when it is remembered that, while labour law is a subject of concurrent national and state-level jurisdictions, national laws prevail in the case of any conflict between the two, unless, under Article 254(2) of the Indian Constitution, a later state-level law receives Presidential assent.

These considerations imply that the focus of analysis of the effects of Indian labour legislation should be on the national law. Here, the requirements of Chapter VB of the IDA stand out for their strict control of employment

terminations, but they are not the only labour law rules with the potential to shape hiring and firing decisions. As is usual in the context of labour regulation, the Indian laws on economic dismissals are just one part of a wider code of rules governing individual and collective work relationships, some of which aim to provide protection for workers, while others are designed to preserve flexibility and autonomy for employers. Laws on dismissal form part of a framework of interlocking rules and principles, and should be analysed in this broader 'systemic' context if their effects are to be properly understood.

To put the issue this way raises fresh methodological problems. Coding an entire labour law system, even just at the level of *de jure* law, involves a substantial task of collating and interpreting primary legal materials. To get a sense of how far laws protect worker interests, on the one hand, or provide flexibility to employers, on other, graduated variables, as opposed to dichotomous or binary ones, are required, but this increases the likelihood of measurement error. In order to ensure consistency of coding, algorithms or protocols will need to set out in some detail the basis on which particular laws are to be scored. Decisions on which laws to include in the index have to be made. At these points, an element of subjective judgement is unavoidable. Then there is the issue of weighting: some labour law rules may well be more important than others, so that in an index of any size, it may be necessary to give higher values to some variables than others. Finding a consistent basis for weighting the different indicators may, however, be far from straightforward, and will almost certainly introduce further subjectivity into the coding process.

Notwithstanding these difficulties, a number of labour regulation indices have been developed, in some cases with the encouragement of international agencies and institutions. The OECD's Employment Protection Legislation Index was the first of its type (Grubb and Wells, 1993; OECD, 2004; Venn, 2009) and was followed by the Employing Workers Index of the World Bank's *Doing Business Reports* from 2004 onwards (World Bank, various years). The World Bank's indices are based on the methodology developed by Botero et al. (2004). Their study codes for the labour laws of 85 countries, including India, using an index consisting of around 60 variables in total. The individual indicators are grouped into a number of categories which generate three principal sub-indices, on employment laws, collective labour laws, and social security laws. Botero et al. (2004) code laws use a 0-1 scale, with 0 indicating least protection for workers, and 1 indicating maximum protection. Their analysis can be used to produce country-level scores for regulation on particular aspects of labour law (such as dismissal law and strike law) as well as an aggregate score for the level of protection conferred by a national system of rules considered as a whole. As a result of its large sample of countries and the wide range of labour law rules, by

subject-matter, that it codes for, the Botero et al. index has been very extensively used and cited since its publication in the mid-2000s.

The principal shortcoming of the Botero et al. index is the lack of a time series. The data on which the index is based appear to be drawn from accounts of the law of the relevant countries at a vaguely defined point in the late 1990s. This would not matter if labour laws did not change much, but as we have just seen in the Indian case, labour law is an area of regulation that is subject to change. The lack of a longitudinal element to the Botero et al. index means that it cannot be used to study the effects of changes in labour law over time, and that the correlations between legal rules and economic outcomes which it has generated should not necessarily be equated with causal relationships (see Deakin, 2011a, for discussion of this point).

3.3. Time-series data on Indian labour law: the Labour Regulation Index ('LRI')

To address the need for a longitudinal measure of labour regulation, a team of researchers at the Centre for Business Research at the University of Cambridge, of which the present authors are members, has developed a Labour Regulation Index (LRI) covering changes in the law of a number of developed and developing countries for the period 1970-2006. India is one of the countries in this index.

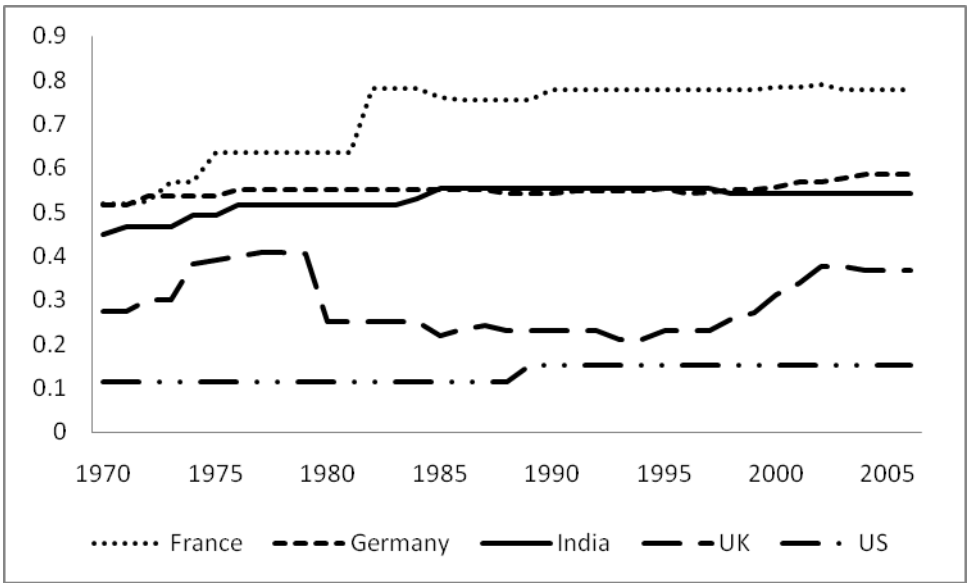
The LRI consists of 40 indicators grouped into five areas of labour law regulation: the law governing the choice of alternative forms of the employment contract (dependent versus contract labour, part time work, fixed-term employment, agency work); working time; dismissal; employee representation; and industrial action. The areas covered more or less track those contained in the Botero et al. index, with the exception of social security law, which is not coded in the LRI. The individual indicators, and the protocols used to code them, are somewhat differently defined from those in Botero et al. (2004), but again go over similar ground. A 0-1 scale is used to score each indicator, with higher scores indicating a higher level of worker protection. Justifications for the choice of indicators, their grouping into sub-indices, and the definition of the coding protocols, are set out in Deakin, Lele and Siems (2007). The full dataset, which contains detailed explanations for the codings and references to the primary legal sources on which the scores are based, is too lengthy to reproduce here, but may be consulted online (CBR, 2007).

The LRI, as originally constructed, contained data on five countries: France, Germany, India, the United Kingdom and the United States. These countries

were chosen because they represent three 'parent' systems in the sense identified by the legal origins theory of La Porta et al. (2008), that is, countries whose legal systems were not derived or imported from a model initially developed elsewhere (France, Germany and the UK), and two other countries, the USA and India, whose different stages of economic development made them contrasting cases for the study of the evolution of legal rules (Deakin et al., 2007; Armour et al., 2009b). Other countries have been coded using the LRI since the first appearance of the dataset; these include Australia (Gahan et al., 2012), New Zealand (Anderson, 2010) and Sweden (Malmberg and Lundmark Söderberg, 2010).

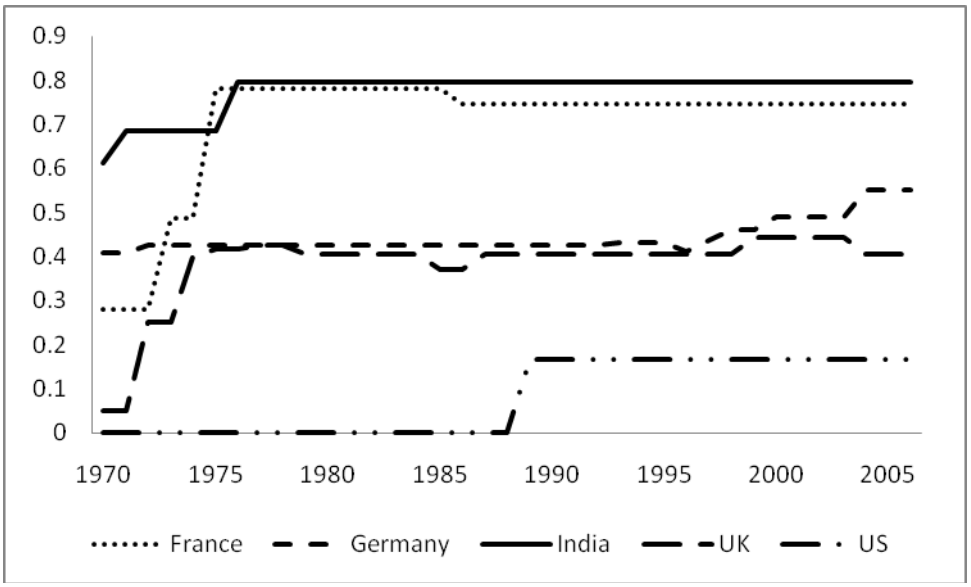
Figure 1 indicates the broad trend in the evolution of Indian labour law over the period 1970 to 2006 by comparison with those in the four other countries coded by Deakin et al. (2007). The Figure indicates the movement in the average totals (out of 40) for each country over the period of the study. It can be seen that India's labour regulation is highly protective by international standards. At the outset of the period in the early 1970s, it was comparable to that in France, and above those of the other three countries (considerably so in the case of the USA). Over time, there was some moderate strengthening of worker protection in the Indian case, while that in Germany fell slightly, and that in France rose. Figure 2 represents the scores for the sub-index on dismissal protection. Here, India appears as having the most protective score of all the five countries. In so far as India has a system of labour regulation that is pro-worker by reference to international comparisons, the effect is largely due to its laws on termination of employment. Figure 3 makes the same point in a different way: if we break down the Indian scores by referenced to the individual sub-indices, the sub-index on dismissal protection scores more highly than any of the others.

Figure 1. Labour regulation in five countries, 1970-2006



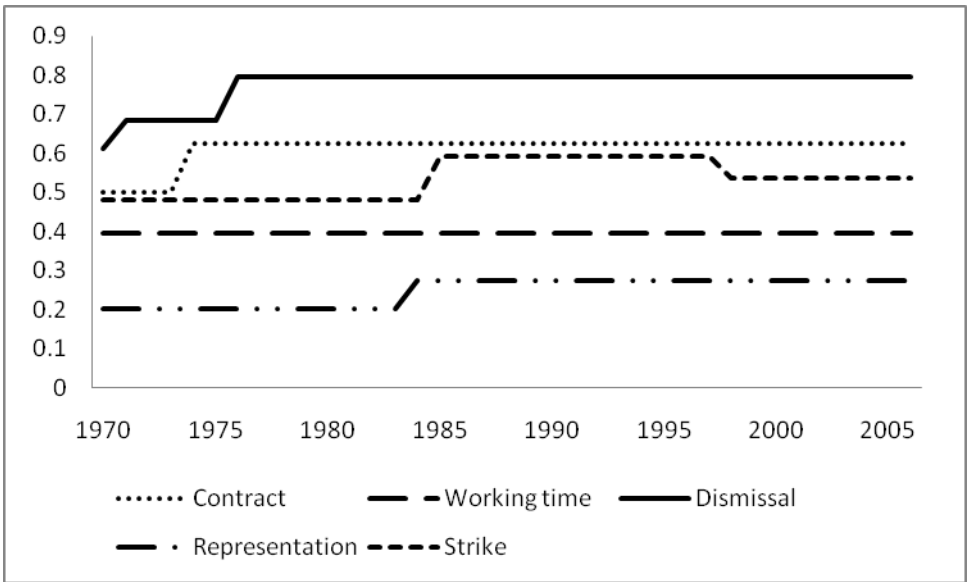
Source: CBR Labour Regulation Index (CBR, 2007). Scores are normalised on a 0-1 scale.

Figure 2. Dismissal regulation in five countries 1970-2006



Source: CBR Labour Regulation Index (CBR, 2007). Scores are normalised on a 0-1 scale.

Figure 3. Components of Indian labour law 1970-2006



Source: CBR Labour Regulation Index (CBR, 2007). Scores are normalised on a 0-1 scale.

A closer look at the scores in the sub-index for dismissal helps to explain why this area of Indian labour law is so often singled out for attention. The first variable in the sub-index provides a measure of the length of notice that a worker is entitled to prior to termination. According to the coding protocol for this indicator, a rule of 12 weeks' notice or above in the case of a worker with three years' service generates a score of 1, with lesser periods generating lower scores, down to a score of 0 if there is no notice entitlement. On this basis, a score of 0.33 is given from 1970 onwards. This rises to a score of 1 in 1976 with the passage of section 25N of the Industrial Disputes Act. Although the constitutionality of this provision was contested up to 1992, when the Supreme Court decided in favour of its validity (*Workmen* v. *Meenaskhi Mills* (1993) 3 SCC 336), a coding of 1 is given from the year in which the law was enacted because its constitutionality, while in some doubt, was accepted in many jurisdictions throughout this period, even to the point where some states, as we have seen, adopted local laws in an attempt to shore up the national provision at a time when its legality was unclear. The scores for legally mandated redundancy compensation and the minimum period of qualifying service needed to bring an unjust dismissal claim are also towards the upper end of the scale using the coding protocols applicable to these indicators, at 0.5 and 0.67 respectively, and were so from the beginning of the period of study, under provisions of the IDA going back to 1947. This observation also applies to the fourth indicator, which concerns procedural standards governing dismissal.

Indian labour law is given the highest possible score, 1, for the whole of the period, on the basis of long-standing statutory rules setting out procedures to be followed in the case of termination on the grounds of misconduct, and sanctions for breach. A lower score (0.33) is given in respect of the fifth indicator, concerning the scope of substantive constraints on dismissal, which reflects the flexibility accorded to employers on this matter, and on remedies, the sixth variable, a score of 0.67 reflects the equal weight given to reinstatement and compensation as sanctions available to the court. The seventh variable relates to the rules on notification and authorisation of economic dismissals. Here, the rules on authorisation of retrenchments under section 25N of the IDA, as amended in 1976, give rise to a score of 1 from that year onwards (a coding supported by the points made above concerning the constitutionality of this law and the state-level responses to this issue). Comparison with the scores of other countries suggests that India has been something of an outlier on this point: none of them required authorisation from the state for economic dismissals, with the exception for France between 1975 and 1985. On the eighth and ninth variables, concerning redundancy selection and priority of redundant workers in re-hiring respective, Indian labour law is again highly protective by international standards, scoring the maximum of 1 in each case.

Some aspects of the coding of other parts of Indian labour law may be briefly noted (full details are contained in the dataset, see CBR, 2007). Indian labour law provides limited flexibility for employers in the choice of alternative employment relationships, placing limits on the use of fixed-term contracts and regulating agency work. Working time is subject to formal controls on daily working hours which are protective by international standards and sets high premia for overtime work, but fewer controls on the number of overtime hours that may be worked. The Indian constitution provides few guarantees in relation to employee representation or the right to strike, but more specific legislation is supportive of the right to strike, permitting forms of secondary or sympathy strike action, and the extension of terms and conditions set out in collective agreements. In each of these areas, Indian labour law is not the outlier which is in respect of parts of dismissal law, but a general tendency towards worker protection is confirmed.

To sum up, the LRI provides a quantitative basis for understanding certain features of Indian labour law in a global, comparative context. The coding method used highlights the strongly pro-worker orientation of dismissal regulation in India, by comparison even to countries which a longer history of industrialisation and with strong labour law traditions, such as France and Germany. Indian labour law has been consistently more protective of worker interests than that of its ‘parent’ system, the UK.

The LRI seeks to code the rules of national labour law systems in order to throw light on cross-country differences; thus its focus is different from that of Besley and Burgess' analysis, which focuses on cross-state variation within India. The LRI cannot, by definition, capture aspects of legal variation within national systems, and in describing the law of a given country as if it were uniform and homogeneous, when it may in practice be differentiated at the level of sub-national units, it risks presenting a distorted picture. The solution to the problem of how to code federal states adopted in the case of the LRI is to include in the coding legal rules of sub-units which account for a high proportion of employment and/or of the location of firms, where there are significant state-level additions to or modifications of national level laws (see Deakin et al., 2007). The codings for the LRI for India include some references to state level practice in areas, such as collective worker representation, where this is particularly important as a source of labour law rules. In these cases, the laws coded were those of the state of Maharashtra, which was chosen as it is one of the more industrially developed states and also one with extensive labour law provisions (CBR, 2007).

3.4 Aspects of leximetric method

The LRI is the product of a particular methodological approach to the quantification of legal rules, which has been termed 'leximetrics' (Lele and Siems, 2007; Siems and Deakin, 2010). While the term leximetrics can refer to any numerical or quantitative legal analysis, its use in the present context indicates a specific technique which seeks to derive quantitative data on legal systems from a process of *functional* legal analysis. The approach is functional in the sense that the coding process depends on identifying, for any given area of legal rules, a set of indicators whose content is determined by the function performed by those rules. Thus in the case of the LRI, the indicators describing labour law rules are defined in terms of how far those rules have been designed perform the function of worker protection. This is, of course, a highly reductive process. Many legal rules serve multiple functions. The leximetric technique used here requires the isolation of a particular function of a given legal rule to the exclusion of others. However, the utility of the index is to be judged here by reference to the purposes for which it is being prepared, that is to say, for statistical analysis aimed at elucidating the relationship between the rule and certain aspects of its external political and economic environment. No labour lawyer would regard the LRI as anything but a highly condensed, summary representation of a particular dimension of the labour law rules it describes. It could not in any sense be regarded as a full account of a given national labour law system. But this is not to say that the LRI, or an index like it, cannot be an accurate account of the aspects of labour law systems which it is seeking to capture, or at least as accurate as possible given the limits of time and resources

that can be devoted to the coding process. Because the dataset is accompanied by an explanation of the coding process which cites original legal sources and in the case of each value seeks to justify the score that has been given, the coding process is, as far as possible, open to external scrutiny and validation.

A second feature of leximetric coding is that it is *interpretive*. The focus is on the rule as a norm, that is to say, on its normative content, not on its social or economic effects. This approach is based on an assumption that the normative content of the rule can be identified to a reasonable degree of accuracy through an interpretive process, based on a legal analysis of the text or texts from which the rule is derived. The codings in the LRI were all made by legal scholars with expertise in labour and comparative law who were responsible for designing the index and drawing up the coding protocols. The individual scores were discussed by members of the team and were subject to a process of iteration between them before being finalised. While an element of subjective judgement cannot be avoided in the coding process, the index can be thought of expressing a collective judgment by legal scholars which is a good proxy for the view taken of those rules in practice. In the case of the Indian coding, one of the team members responsible for the scores was a legal scholar with specific expertise in the Indian system.

Conversely, leximetric coding does not purport to offer a quantitative account of the social and economic effects of legal rules. It is purely a measure of formal regulations, that is, the *de jure* content of rules. A given leximetric coding makes no assumption about whether a given rule is observed in practice. Nor does it seek to quantify the actual costs (or benefits) of a given regulation. This is not because these things are not of interest; they are of central interest in the context that we are considering here. Rather, the aim in carrying out leximetric coding is precisely to arrive at a measure of the normative content of legal rules which is separate from measures of their impact and effect, so that potential causal relationships between legal phenomena and these other variables of interest can be identified. Evidence of the effectiveness of a rule in practice is available through other sources, such as the evidence on court efficiency and enforcement levels analysed for the Indian case by Fagernäs (2010), or evidence on employer and worker perceptions of the operation of the law in practice of the kind which are collected via workplace surveys for some other countries (see, for example, van Wanrooy et al., 2007, on Australia). Evidence on the economic variables to which legal phenomena might be related, either as causal or outcome variables, are available through sources which include national, sectoral and company level data on economic and financial performance, of the kind we use in our econometric analysis, to which we now turn.

4. Labour law, industrial development and unemployment: identifying causal relationships

The LRI can in principle be used to analyse a large range of issues concerning the impact of labour law rules on the economy, and vice versa. Because of its cross-country coverage, it can be used in panel data analysis to study the effects of labour law rules in multiple jurisdictions, and so to make comparisons between different legal regimes on the basis of factors such as their legal origin or state of development (see Deakin and Sarkar, 2008, and for a similar approach to company law data, Armour et al. 2009a; Deakin, Sarkar and Singh, 2012). In our present analysis we use the LRI to study the effect of changes in labour law over time in a single country case, that of India. A long time series facilitates certain kinds of longitudinal analysis, through which relations of cause and effect can more effectively be identified than would otherwise be the case.

The advantage of time-series analysis is that it can be used to identify both short-term and long-term relationships between the variables of interest and to isolate the direction of causality. Cross-sectional analysis, which by definition cannot tell us anything about dynamic, time-variant relationships, is also limited in what it can say about causality. Where a cross-sectional regression analysis identifies a correlation between two variables as measured at a given point in time, correlation need not imply causation. It may be both theoretically and analytically unclear which variable is the causal one and which the outcome one. Thus in studies of the relationship between legal and economic phenomena, it may be just as plausible to assume that a change in the law is the result of a shift in economic conditions, as it is to assume that the law is an exogenous cause of economic outcomes. A number of techniques can be used in the framework of a cross-sectional study to get this round this problem, including the use of instrumental variables or, in the context of a 'before and after' study, a difference-in-differences analysis, but these have limitations. An appropriate 'instrument' for the legal variable – that is to say, one which can plausibly be assumed not to be endogenous in any way to the economic outcome variable – may simply not be available, while difference-in-difference analyses suffer from problems of serial correlation which can give rise to false regressions in the context of studies of the economic impact of legal rules (for general discussion of these issues, see Deakin, 2011a: 42-44, and for analysis of them in the context of the econometric techniques used by Besley and Burgess (2004), see D'Souza, 2010: 125-6)

Our approach here is to estimate the causal impact of labour law on unemployment in India and vice versa during the period covered by the LRI dataset, 1970-2006. We used data on registered unemployment from the

Reserve Bank of India's *Handbook of Statistics on the Indian Economy* (see Table 1 for details). This dataset does not give a complete picture of the extent of unemployment in India, as it does not measure the under-utilisation of labour in the informal or unregistered workforce. However, it provides a useful measure for analysing the potential economic impact of labour laws, precisely because those laws mostly affect only the formal employment sector. The displacement of workers from the formal employment sector by over-protective labour laws should show up in an increase in the number of the registered unemployed.

In using the LRI in a time-series analysis, we are able to exploit differences in the strength of labour law protection over time which are recorded in that index. As we have seen, there have been significant changes in Indian labour in a worker-protective direction, particularly in the mid-1970s. If the hypothesis of the negative effects of labour laws were correct, these changes could, in principle, have caused short-term shocks to labour demand which were reversed once the system adjusted to a new regulatory framework. They could, alternatively, have had longer-run effects, shifting the system on to a new equilibrium path with higher unemployment. A further possibility is that these legal changes did not have the negative effects contended for them. A time series analysis enables us to test these hypotheses.

It is arguable that the scores in the LRI should be adjusted to take into account limited enforcement of the law. As we have seen, Fagernäs (2010) takes this approach in her study of the impacts of cross-state variation in labour law. Her data are drawn from state-level measures of the effectiveness of the court system and the extent of pro-worker rulings. This strategy is not easily replicable for the study we are undertaking because of the absence of similar national-level data over the period that we are studying. Under these circumstances, a general deflation of the scores in the LRI to reflect a degree of non-enforcement of the law, whose possible extent is not known, could only be done on an arbitrary basis.

It is, on the other hand, possible to bring the general state of the economy into the analysis, in order to isolate the effects of legal change from the effects of the wider economic cycle. Here we use Reserve Bank of India data on the real output of the industrial sector, at 1999-2000 prices (see Table 1 for details). This is a better measure than GDP because we are focusing our analysis on the formal sector rather than the whole economy. The GDP measure includes output from the agricultural and informal sectors which are mostly unaffected by labour law regulation, and which do not produce significant flows into registered unemployment by comparison with those from industry.

The first step in our analysis of the relationship between these variables is to conduct unit root tests. Table 1 indicates that each of the three time series is non-stationary. This implies that a standard regression analysis would give rise to spurious correlations. We therefore employ cointegration analysis to see if, after taking into account the risk of spurious correlations, the three time series are cointegrated with one another. Table 2 reports the results of various tests which indicate that they are; in other words, there are meaningful relationships between them.

Table 1. Labour regulation, employment, unemployment and industrial production in India, 1970-2006: tests of stationarity[1]

Series	Level (with intercept and linear trend)	First difference (with intercept)	First difference (with intercept and linear trend)
Private sector employment	-2.981758 (1)	-4.137613 (0)*	
Registered unemployment	-2.047574 (0)	-0.283508 (4)	-6.249062 (0)*
Real industrial output	-3.258256 (1)	-4.624424 (0)*	
Labour regulation	-1.930935 (0)	-5.697512 (0)*	

* The null hypothesis is rejected at 5 per cent level.

Notes:

1. Tests are based on the null hypothesis of unit root (non-stationarity). The lag length, indicated in parentheses, is based on the Schwarz Information Criterion.

2. With the exception of the labour regulation series, all series are in natural log.

Sources: Reserve Bank of India, Handbook of Statistics on the Indian Economy, http://dbie.rbi.org.in/ (economic data), CBR (2007) (labour regulation data).

Table 2. Labour regulation, unemployment and industrial production in India, 1970-2006: tests of cointegration

Selected number of cointegrating relations by model[1]					
Data trend	None	None	Linear	Linear	Quadratic
Test type	No intercept No trend	Intercept No trend	Intercept No trend	Intercept Trend	Intercept Trend
Trace	2	3	2	2	1
Max Eigenvalue	2	3	2	2	1

Notes:

1. Based on 0.05 level critical values.

The next step is to carry out a VEC (vector-error correction) analysis (Engle and Granger, 1987; Pesaran et al., 2000). This enables us to ascertain the nature of the short-term adjustment processes and to see if they lead to long-term relationships. We estimate three possible VEC models, the estimates of which are reported in Table 3. Table 3 shows one significant relationship between labour regulation and unemployment: labour regulation has a short-term negative relationship with unemployment, and there exists a stable adjustment path leading to a long-term negative relationship (model I in Table 3). This shows that increased labour regulation is associated with lower unemployment over both the short and long term.

We then couple the VEC analysis with Granger causality tests to ascertain the direction of causality. Granger causality tests involve adding past (lagged) values of the independent variable to a regression of present values of the dependent variable against past values of itself (Granger, 1988). If the addition of past values of the independent variable makes a difference to the results, causality running from the independent to the outcome variable is conventionally assumed, although strictly speaking this is a test only of precedence, not of causation as such. Our Granger causality results are reported in Table 4. These show that the direction of causation (interpreted in the sense just defined) runs from the economic variable to the legal one: in other words, lower unemployment leads to more pro-worker labour regulation.

We also see a positive relationship between industrial output and pro-worker labour regulation (models I and III in Table 3). The Granger causality tests suggest that, this time, the direction of causation is in the other direction, that is, from labour regulation to industrial production (see Table 4). Unemployment, on the other hand, has a long-term negative impact on industrial production. The implication is that pro-worker labour laws, along with lower unemployment, push up industrial production. This finding is consistent with the neo-Kaleckian theory of industrial stagnation as applied to the Indian economy (see Dutt, 1984, and Sarkar, 1992). However, our VEC model (model III in Table 3) does not find a statistically significant adjustment path from short-term to long-term relationships in these cases, so we cannot place too much reliance on these findings. There is no evidence that pro-worker labour regulation leads to higher unemployment (see model II of Table 3 and the causality tests reported in Table 4).

Our main finding, on the negative relationship between unemployment and labour law change, suggests that trends in Indian labour law are largely endogenous to conditions in the economy (to similar effect, see Dutta Roy (2004)). Low unemployment triggers pro-worker labour laws, both in the short run and, as the economy and legal system together adjust to a new path, over the

long run too. This finding is compatible with a political economy theory of legal evolution, according to which laws are mostly shaped by the economic and political environment, rather than vice versa. While we also found a short-run positive relationship between labour law and industrial output, suggesting that pro-workers labour law reforms can induce efficiency gains which promote growth, this relationship does not persist, suggesting that the effects of a legal 'shock' are absorbed by the economy without fundamentally altering its equilibrium path. The absence of any evidence that labour law is correlated to, let alone Granger-causes, unemployment, suggests that the hypothesis of labour regulation's anti-efficiency effects is not borne out by the Indian experience.

Table 3. Labour regulation, unemployment and industrial production in India, 1970-2006: vector error correction models

Model I (dependent variable LRI)	Estimates[1, 2]	Model II (dependent variable LUN)	Estimates[1,2]	Model III (dependent variable LIND)	Estimates[1,2]
Long-run relationship		Long-run relationship		Long-run relationship	
LUN	-0.054884 (-6.88399)*	LRI	-18.22028 (-8.85517)*	LRI	20.74464 (4.91776)*
LIND	0.048205 (5.60716)*	LIND	-0.878313 (-7.42730)*	LUN	-1.138547 (-5.06894)*
Short-term relationship		Short-term relationship		Short-term relationship	
Adjustment Coefficient, θ	-0.484543 (-4.97834)*	Adjustment Coefficient, θ	0.128764 (3.56684)*	Adjustment Coefficient, θ	-0.023723 (-1.02473)
ΔLRI_{t-1}	0.092418 (0.58305)	ΔLUN_{t-1}	0.218132 (3.56684)*	$\Delta LIND_{t-1}$	0.109202 (0.63421)
ΔLRI_{t-2}	0.229964 (1.52350)	ΔLUN_{t-2}	-0.322875 (-1.52298)	$\Delta LIND_{t-2}$	-0.115572 (-0.63785)
ΔLUN_{t-1}	-0.083954 (-2.70431)*	ΔLRI_{t-1}	0.211995 (-0.19790)	ΔLRI_{t-1}	-0.470295 (-0.60132)
ΔLUN_{t-2}	-0.050101 (-1.59709)	ΔLRI_{t-2}	0.053584 (0.05253)	ΔLRI_{t-2}	1.965253 (2.63868)*
$\Delta LIND_{t-1}$	0.035904 (1.02887)	$\Delta LIND_{t-1}$	0.376042 (1.59453)	ΔLUN_{t-1}	0.045061 (0.29417)
$\Delta LIND_{t-2}$	0.063855 (1.73889)	$\Delta LIND_{t-2}$	0.250397 (1.00899)	ΔLUN_{t-2}	-0.412977 (-2.66803)*
Constant,C	0.003330 (1.07386)	Constant,C	0.020078 (0.95820)	Constant,C	0.075959 (4.96506)*
Adjusted R-Square	0.427470	Adjusted R-Square	0.427276	Adjusted R-Square	0.164582

Notes:

LRI = labour regulation
LUN = unemployment in natural log

LIND = industrial output in natural log

1. Figures in parentheses are t-values. 5 per cent level of significance is marked by an asterisk (*).

2. We have used a number of criteria such as LR (sequential modified LR test statistic), FPE (Final prediction error), AIC (Akaike information criterion), SC (Schwarz information criterion) and HQ (Hannan-Quinn information criterion) and choose the maximum order of the VAR (Vector Autoregression) model and subtracted 1 to arrive at the order of the VEC model.

Sources:

LRI: CBR (2007)
LUN and LIND: Reserve Bank of India, *Handbook of Statistics on the Indian Economy*, http://dbie.rbi.org.in/.

Table 4. Labour regulation, unemployment and industrial production in India, 1970-2006: VEC causality analysis[1]

Model	Dependent variable	Excluded independent variable	Chi-square	Degree of freedom	Probability
I	LRI				
		LIND	4.312412	2	0.1158
		LUN	14.30850*	2	0.0008
II	LUN				
		LIND	3.767127	2	0.9801
		LRI	0.040137	2	0.1520
III	LIND				
		LRI	7.062344*	2	0.0293
		LUN	7.511676*	2	0.0234

Notes:

LRI = labour regulation
LUN = unemployment in natural log
LIND = industrial output in natural log

* Significant at the 5% level: the null hypothesis of no causality is rejected.

1. VEC causality tests are done on the basis of first differences of the variables. The order of the test is chosen to be 2. We have used a number of criteria such as LR (sequential modified LR test statistic), FPE (Final prediction error), AIC (Akaike information criterion), SC (Schwarz information criterion) and HQ (Hannan-Quinn information criterion) and choose the maximum order of the VAR (Vector Autoregression) model and subtracted 1 from this order of VAR model to get the order of the VEC model.

Sources: see Table 3.

5. Conclusions

In this paper we have used a recently developed dataset, which codes for developments in Indian labour law between 1970 and 2006 using leximetric methods, to study the relationship between labour regulation, industrial output and unemployment. On the basis of a time-series econometric analysis we identified a long-run inverse relationship between labour law and unemployment, with the direction of causality running from the latter to the former: low unemployment leads to the adoption of pro-worker labour laws. We also observed both short-term and long-term positive impact of labour laws, along with both short-term and long-term negative impact of unemployment, on industrial output, although the stability of the time path from short-term to long-term relationship in this case is not statistically significant, so this finding must be treated with caution.

Our results are consistent with the view that, over the short and long run, labour laws are endogenous to the economic and political environment. A benign economic climate, as indicated by low unemployment, creates the right conditions for the enactment of pro-worker labour laws. Such laws can have short-term efficiency enhancing effects, but over time their effect is absorbed and the economy continues on its equilibrium path. This too is consistent with the hypothesis that it is mostly a case of the economy driving legal development rather than vice versa. We see no evidence that labour laws inhibit efficiency or growth.

Our findings are specific to the case we were considering, that of the operation of India's mostly national-level labour laws, over a particular period of time, and cannot be generalised. Nevertheless, the Indian case is a significant one, not simply because of the size of the Indian economy, its recent rapid growth, and its growing importance in the global economic system, but also because India is frequently held up as an example of the negative impact of labour regulation, particularly in emerging markets. Following Besley and Burgess (2004), many academic commentators and a range of governmental bodies have come to accept that India's unusually pro-worker labour laws have become a major hindrance to industrial growth and to the expansion of the formal sector at the expense of informal or unregistered employment. Why are our findings so radically different from those of this much-cited earlier study?

Part of the answer, of course, lies in the different focus of the Besley-Burgess paper: they looked at cross-state variations in the period from the late 1950s to the early 1990s, while we used an indicator of change in labour laws operating mostly at national level in the period from the early 1970s to the mid-2000s. However, this clearly cannot be the whole explanation. If Besley and Burgess

were correct to point to the negative employment effects of pro-workers laws at state level, it would be surprising to find that the adoption of pro-worker laws at national level over an extended period of time did not have some of the same effects.

One possible reason for doubting the veracity of Besley and Burgess's results is that their legal index takes no account of gaps in the enforcement of the law and more general limits on its effectiveness (Bhattarcharjea, 2006, 2009). When data on the working of the court system and the degree to which judges decide cases in a pro-worker way are factored into regression analyses, the negative effects obtained by Besley and Burgess (2004) disappear (Fagernäs, 2010).

If Indian labour laws had no inefficiency effects simply because they were not enforced, there would not be a strong case for retaining them in their current form. A case for the reform of labour laws in India can be made on numerous grounds, including their limited application to workers outside the 'core' of the formal economy, lack of flexibility in their administration, and the difficulties faced by both workers and employers in accessing the court system (Jha and Golder, 2008; Bhattacharjea, 2009; D'Souza, 2010). However, on the evidence that we have presented here, the removal of protective labour legislation would not achieve efficiency gains. Pro-worker labour laws have proved no hindrance to industrial development in the period since the liberal turn in economic policy in the early 1990s, and their repeal is unlikely to assist economic growth going forward. If there are rigidities in the Indian economy which are currently holding back the growth of formal employment, they must be sought elsewhere.

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