LABOUR LAW, JUDICIAL EFFICIENCY AND INFORMAL EMPLOYMENT IN INDIA

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Abstract
This study assesses the effects of industrial disputes legislation and the dispute settlement process on informal versus formal employment in India. It uses indicators of pro-worker court awards and court efficiency as well as amendments to the Industrial Disputes Act (IDA) at the level of Indian states. The state-level IDA amendments are classified as pro-worker or pro-employer and enforcement enhancing. Three complementary empirical approaches and data sources are used. These include a quasi-panel dataset constructed from four household employment surveys (NSSO) between 1983-1999, a state-industry level panel dataset for organised (formal) sector industrial units (ASI) for 1980-1997 and a cross-sectional survey of unorganised (informal) manufacturing firms for 2000/2001.

The significance of the judicial indicators varies by indicator and the magnitude of relationship with formal employment remains rather small. The evidence is neither robust, nor consistent, enough to confirm that pro-worker judicial change would be related to a lower degree of formal work in the entire service or industrial sectors. However, pro-worker judicial change and judicial efficiency can be linked more consistently to a formalisation of work within the organised industrial sector. More efficient courts are also associated with a lower tendency of unorganised firms to produce for a sub-contractor. Finally, education, personal attributes and social status are found to be significant correlates of employment type, which implies that policies aiming to raise formality should also focus on such factors.

JEL Codes: J21, K31, O17

Keywords: Informal employment, labour law, industrial disputes, judicial efficiency, employment structure

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1 INTRODUCTION

Legal protection for formal sector workers in India is considered strict, and the existing laws have been criticised for impeding industrial growth and formal sector employment generation. In the 1980s, when deregulation of industries and trade began, output growth in the formal manufacturing sector accelerated, but employment growth appeared to come to a halt. This combination sparked a discussion about "jobless growth". Some blamed the increases in legal protection for labour, others rising wages and increases in working hours (see e.g. Fallon and Lucas, 1993, Bhalotra, 1998 and Nagaraj, 2003). The government recently enacted a Rural Employment Guarantee Act (2005) in recognition of a need to provide adequate employment and social security.

This paper addresses the debate by analysing whether labour regulation and the industrial disputes climate contribute to the persistence of an informal-formal employment divide in India. It assesses the relationships between dispute settlement and related labour regulation (Industrial Dispute Act) and formal-informal sector employment from several perspectives.

Indian labour regulation consists of several central acts, which have been amended by states over time as well as some state-specific acts. A key determinant of applicability of different labour laws is the number of employees in a firm. This threshold varies by Act and Sections of different Acts. With very few exceptions most labour acts in India apply, or are relevant only to the organised sector.

The majority of non-agricultural workforce does not work in the organised sector defined either by maintenance of regular accounts or applicability of labour and social protection. Chandrasekhar and Ghosh (2003) estimate that in the year 2000-01, the unorganised sector contributed to 82% of total manufacturing employment. At a general level, the distinction between the unorganised and organised sector is possibly clearest in the case of manufacturing and mining. In Indian official statistics, all units in these sectors with power employing more than 10 workers, and those without power, employing more than 20 workers, are classified as organised and should maintain regular accounts on activity and employment.[1] Such units also fulfil the definition of a "factory" as defined in the "Factories Act" and are expected to comply with the core of nation and state-wide labour and industrial legislation.

The Industrial Disputes Act (IDA), a central piece of legislation, is important from the perspective of job security and the rights of workers concerning labour disputes. Since a 1982 job security amendment to IDA that came into force in 1984, industrial firms with more than 100 permanent workers have been required to apply for state government permission concerning the lay-off or retrenchment of a permanent worker or the closure of the firm.[2] It is generally perceived that such laws leave firms with too little flexibility, which could deter formal sector employment growth, and that the laws should be modernised (see e.g. CII, 2004). On the other hand, the majority of workers remain without adequate social or labour protection.

Although protection for formal workers may appear strict on paper, enforcement and implementation can be a different matter. The central IDA was amended individually by Indian states until the late 1980s after which, little has changed on paper. Despite lack of formal change, it is perceived that the application of labour laws has changed, especially in response to the liberalisation wave in the 1990s (see e.g. Nagaraj, 2007).[3] Figures on strikes and lockouts (see e.g. Sen, 2003 and Jyoti and Sidhu, 2003) suggest that employers have steadily gained more power. An increase in the number of lockouts on the part of employers has been accompanied with a fall in the number of strikes, especially in the 1990s. Additionally, many industrial disputes are left un-resolved by the legal system due to the inefficiency of the Indian legal system. In May 2000, there were 533,038 cases pending in the Indian Labour Courts, out of which 28,864 had been pending for over 10 years (Sivananthiran and Ratnam, 2003).

The settlement of industrial disputes and the enforcement of labour and industrial legislation fall under state government jurisdiction, with the exception of some industries. Thus, the functioning of the industrial relations mechanism and enforcement can depend on government attitudes and political orientation. It is the responsibility of the state government to arrange for conciliation of a dispute and if such fails, with the exception of certain states, only the government can refer the dispute to a state Labour Court or Industrial Tribunal.

Existing studies on the effects of IDA in India have focused on the productivity of firms and employment in the organised sector (see e.g. Hasan et al., 2007, and Besley and Burgess, 2004) and mostly statutory change. The arguments above suggest that it should also be of interest to assess whether labour legislation matters for the unorganised-organised (formal-informal) employment divide. For instance, if a firm has the option to hire workers not protected by job security provisions, it could gradually shift to such without

necessarily becoming less productive or losing employees. They also suggest that it would also be important to examine the court process in practice.

The focus of this paper is on the functioning of the dispute settlement mechanism and changes to IDA at the level of Indian states. Indicators on court efficiency and the share of pro-worker awards in the dispute settlement process are constructed for each Indian state for the period 1979-1999. State level amendments to the IDA are coded either as those that aim to facilitate and strengthen the dispute settlement process and strengthen the implementation of awards, or those that raise the protection of workers or employers. In a study on the effects of Indian labour regulation, Besley and Burgess (2004) have previously classified state-level amendments to IDA as pro-worker or pro-employer, but this paper proposes a modified classification. It is acknowledged that results can be sensitive to the chosen categorisation and the form in which these variables enter the regression. Thus, the indicators of the judicial process in practice are a valuable addition.

There are several channels via which the judicial process captured by the above indicators can affect the degree of informality. Since only permanent workers in organised firms are covered by job security provisions in IDA, temporary, or contract workforce, provides a means of circumventing these provisions. Bhandari and Heshmati (2006) show that the share of temporary, contract workers in Indian manufacturing industry, excluding managerial and administrative workers, has doubled over the period 1992-2001. Sasikumar and Sharma (1996) also claim that employment expansion in the manufacturing sector in the early 1990s happened mostly via the use of non-permanent workforce.

Additionally, pro-worker judicial changes could affect the tendency of firms to shift some of their production or sub-contract work to smaller units that are not covered as strictly by various labour laws. More generally, changes in the judicial indicators could also deter both small and large firm expansion plans and thus the growth of formal employment.

The relationship between informal work and efficient labour courts, or legal change aiming to improve enforcement and efficiency, is a priori unclear. Such change can encourage firm expansion and the hiring of formal workers, but could potentially also be seen as a further impediment. If law enforcement is perceived as lax and dispute cases left unsolved by the judiciary, labour laws are less likely to pose a significant impediment to firm recruitment practices or productive decisions. On the other hand, higher court efficiency, better

enforcement and speedier dispute settlement may encourage expansion of salaried and regular or organised sector work.

The analysis in this paper is carried out in three steps. The first and primary question examined is: do regulation and the court process affect the share of formal (regular) workers in industry and services overall? The employment data used come from four national, cross-sectional, household employment-unemployment surveys with individual-level information, over the period 1983-1999. These are used to construct a quasi-panel dataset. In the absence of more detail, regular salaried workers are used to proxy for formal workers. A justification is provided. This analysis is complemented with a brief examination of organised and unorganised sector links. Firstly, the relation between the judicial indicators and social security coverage in the organised manufacturing sector is examined. For this purpose, an industry-state level, annual panel dataset for the period 1980-1997 is used. It is argued that within industry changes in the relation of employers' social security contributions to the total wage bill can function as a proxy indicator for the degree of work carried out by temporary, contract workers. Secondly, the study examines the connection between the judicial indicators and the prevalence of sub-contracting production to the unorganised sector. This part utilises a national survey on small, unorganised sector manufacturing firms for 2000-01.

The results show that the significance of judicial indicators varies by estimated model and the magnitude of relationship with formal employment can be small. One of the conclusions of the analysis is that the hypothesis of a clear negative link between formal employment and pro-worker judicial change does not hold. The results of the first analysis on regular versus irregular work are not robust to specification or indicator, and a strong relationship between judicial change and an economy-wide formal-informal employment divide in the case of the service or industrial sectors cannot be confirmed.

However, judicial change, both increased pro-worker orientation and efficiency, can be linked more consistently to formalisation of work within the organised industrial sector. Thus, intuitively, the influence of judicial change is clearest for sectors and workers directly affected and covered by IDA and other labour laws. Additionally, cross-sectional results show that more efficient courts can be associated with a lower tendency of unorganised firms to engage in a sub-contracting arrangement. Finally, an additional cross-sectional analysis reveals that education, personal attributes and social status are significant correlates of employment type. Although legal factors, such as court efficiency, can play a

part, the results imply that policies aiming to raise formal employment should also target social inequalities.

The paper is organised as follows. Section 2 reviews briefly some of the existing relevant literature. Section 3 describes Indian labour laws, the dispute settlement process and presents data on the labour regulation indicators and associated hypotheses. Section 4 focuses on the analysis of the employment survey data and Section 5 complements the analysis with a focus on organised industries and contract work by unorganised firms. Section 6 concludes.

2 LITERATURE

Dual labour markets have interested economists for long, starting with the work of Lewis (1954). The topic of informality has however re-emerged with data developments and the literature on the effects of labour protection on employment. With recent trade liberalisation episodes in developing countries, studies have also started to examine how labour regulation affects the capacity of firms to adjust when faced with competitive pressure arising from economic liberalisation. This Section describes briefly some of the existing empirical research that is relevant from the perspective of this study.

In a study on the effects of state-level amendments to the Industrial Disputes Act (IDA) in India over the period 1958-1992, Besley and Burgess (2004) speculate that a higher degree of worker protection should affect firm productivity or output via a price-effect or an expropriation effect. The first refers to adjustment costs in the hiring and firing of labour. If these are high due to more pro-worker regulation, firms may substitute capital for labour. Labour regulation may also discourage firms currently not subject to regulations from expanding. The second refers to the worker's capacity to extract their share of returns to investment. If labour protection raises this, it may lower the desire of firms to invest and impede growth. With state-industry level panel data, the authors find that pro-worker amendments to IDA have had a negative impact on productivity, output and employment in the organised manufacturing sector, and led to a substitution of labour by capital. With aggregate state-level data, they also show that pro-worker changes in regulation have raised the level of output in unorganised manufacturing and lowered it in organised manufacturing.

The Besley and Burgess regulation measure has been used in other studies on India and also subjected to critique (see e.g. Bhattacharjea, 2006 for latter). Using this indicator, together with data on strikes and lockouts, Sanyal and Menon (2005) find that firm location choice is affected negatively by the

number of Labour Courts, unions on register and days lost to industrial dispute activity in the state. A further study (Aghion et al., 2006), using the same labour protection measure as Besley and Burgess (2004) finds that the deregulation of industries that took place over the 1980s and 1990s in India led to better performance of industries that were located in states that had enacted more pro-employer amendments to the IDA. Hasan et al. (2004) find that trade liberalisation raises the elasticity of labour demand in the organised sector more in states that have more pro-employer regulation. They have made a slight ad hoc modification to the Besley-Burgess index. In a recent study, Amin (2006) uses a World Bank enterprise dataset of retail businesses in India and finds that labour regulation affects the substitution of labour by technology such as computers.

There are fewer, but a growing number of studies on the effects of labour laws that focus on the informal and formal sector divide or the effects of law enforcement. In a survey on Latin American countries, Heckman and Pages (2003) find that job security provisions reduce the demand for labour for younger workers, exacerbate the formal-informal sector divide and raise inequality. In a study on Colombia and Brazil, Pavcnik and Goldberg (2003) show that in Colombia trade liberalisation was accompanied with a rise in the firm's tendency to employ informal workers, but only prior to regulatory changes that increased labour market flexibility. Kugler (2004) finds evidence of an increase in job turnover of formal workers covered by labour protection in relation to turnover of informal workers after a relaxation of job security provisions in Colombia. Almeida and Carneiro (2006) assess the effects of labour regulation on informality with cross-sectional, firm-level dataset for Brazil by focusing on law enforcement that varies by cities. Their results suggest that stricter enforcement lowers the share of informal workers, but also lowers productivity and wages.

This study on India focuses on the efficiency and outcomes of the dispute settlement process rather than simply the flexibility offered by law to the employer. The effects of law enforcement at the micro-level in India have previously been studied for instance by Chemin (2004). He uses a cross-sectional dataset and focuses on High Court efficiency in general and among other things, it's the effects on unorganised firm finance, and sub-contracting. Although, the focus is different, the third part of the analysis in this study on contract work in unorganised firms bears some resemblance to the empirical work by Chemin.

A more general aspect on informality is raised for instance by Maloney (2004). He emphasises that the fact that informal sector employment is a choice for some is often neglected, and it cannot be taken for granted that informal sector workers are necessarily worse off than formal ones. The heterogeneity of informal workers also implies that the organised and unorganised sectors do not simply operate as two entirely separate sectors, but that links can exist between the two. This motivates the additional analysis on sub-contracting activity in this paper.

3 INDIAN LABOUR LAWS AND INDUSTRIAL RELATIONS CLIMATE

3.1 LABOUR LAWS

The Industrial Disputes Act 1947 (IDA) is one of the central labour acts and is common to all states. It sets out the guidelines for conciliation, arbitration and abjudication in the case of an industrial dispute. Employees covered by IDA are workmen. This includes most employees with the main exception being those whose main duty is of a managerial, supervisory or administrative capacity (Section 2s). The IDA (Section 2k) defines an industrial dispute as "any dispute or difference between employers and employers, or between employers and workmen, or between workmen and workmen, which is connected with the employment or non-employment or the terms of employment or with the conditions of labour, of any person".

One of the main purposes of IDA is to define the procedures for dispute settlement and the authorities involved. It also includes provisions on the layoff and retrenchment of workers and associated compensation and specifies employer's duties in the case of changes in service conditions. It regulates strikes and lockouts and restricts them especially in public utility services[4] and during pendency of conciliation or arbitration of a dispute. It also lists conditions required for closure of establishments and prohibits "unfair" work practices. Additionally, it defines the penalties involved.

This study focuses on the IDA, because it is a central act to consider for the debate on the effects of labour law on hiring practices and expansionary activity of firms. There have been some central level amendments to IDA during the 1980s and 1990s, but states have themselves amended it more frequently during this period than other key central labour acts, which have seen little state level amendments since the early 1980s.

A controversial central amendment in 1982 (came into force in 1984) extended the coverage of Chapter V-B of IDA from industrial establishments employing over 300 to those employing over 100 workers. Chapter V-B applies only to manufacturing and mining units and plantations and not to service sector units. It does not apply to establishments of "a seasonal character" and only to workers "who have been in continuous service for not less than one year". Thus, it is not applicable to temporary, contract workers, which is why it is argued that larger firms may circumvent it by employing more contract workers, who are typically temporary or short-term workers. Chapter V-B specifies that in units with more than 100 workers

"*on an average day no worker whose name is on the muster roll (wage register) can be laid off without prior permission from the appropriate government or authority, unless the layoff is due to a shortage of power or to natural calamity*".

Permission for similar establishments is required also for retrenchment of workers and closure of the establishment.[5] Some provisions on general notice periods for retrenchment and layoff apply to all workers.[6] Those on entitlement to compensation for layoff and firm closure apply further to non-seasonal industrial (not service) establishments with more than 50 workers (Chapter V-A), when the workman "has been in continuous service for not less than one year".

As listed in IDA Schedule 2**,** Labour Courts have jurisdiction over matters such as standing orders, discharge and dismissal of workers, and illegality of strikes and lockouts. In addition to matters within the jurisdiction of a Labour Court, Industrial Tribunals can also abjudicate on matters under Schedule 3 of IDA (e.g. hours of work, wages, leave with pay, retrenchment and closure of establishment, bonus and provident fund).

Since items up for dispute extend beyond those covered in IDA, it is worth mentioning a few other general labour acts. Individual employment contracts, employment conditions and employer-employee relations are regulated by the Industrial Employment (Standing Orders) Act (1946), which covers all industrial units (excludes several services) with more than 100 workers. The Factories Act (1948) aims to protect the health and safety of workers, and applies to all units with more than 10 workers or 20 workers if electricity is not used. The Minimum Wages Act covers in theory anyone working in India and state governments have the right to fix and change the level of minimum wages.

The two important welfare acts are the Employees' State Insurance Act (1948) and the Employees' Provident Fund Act (1952). The former applies to all "factories" (above ten workers with power) in the first case and latter to any establishment with over 20 workers. The first concerns employee benefits in the case of sickness, maternity or injury, and the second relates to pensions.

Although disputes can be raised under IDA in several areas, these aspects rarely apply to unorganised sector workers (job security, leave pay, standing orders, provident fund, bonus etc.) and procedural formalities prevent the raising of disputes in the unorganised sector (see e.g. Chandrasekhar and Ghosh, 2002). As these authors note, the majority of unpaid household work is not yet even recognised as employment. Although the IDA would apply in general to most service sector activities, not all of these would be covered by other Acts. Thus, general applicability of the IDA may still remain a matter of interpretation in the case of some service and trade activities.[7]

The Contract Labour Act (1970) regulates the use of temporary, contract workers and applies to all units employing more than 20 contract workers over the past year or a contractor employing more than 20 workers, but not to establishments where work overall is of a casual or seasonal nature.[8] Contract workers are in theory entitled to similar benefits in terms of social security (provident fund and employees' state insurance) than permanent workers. They are also entitled to similar wages, but evidence and observations suggest that this can be far from the case (see e.g. Bhandari and Heshmati, 2006).

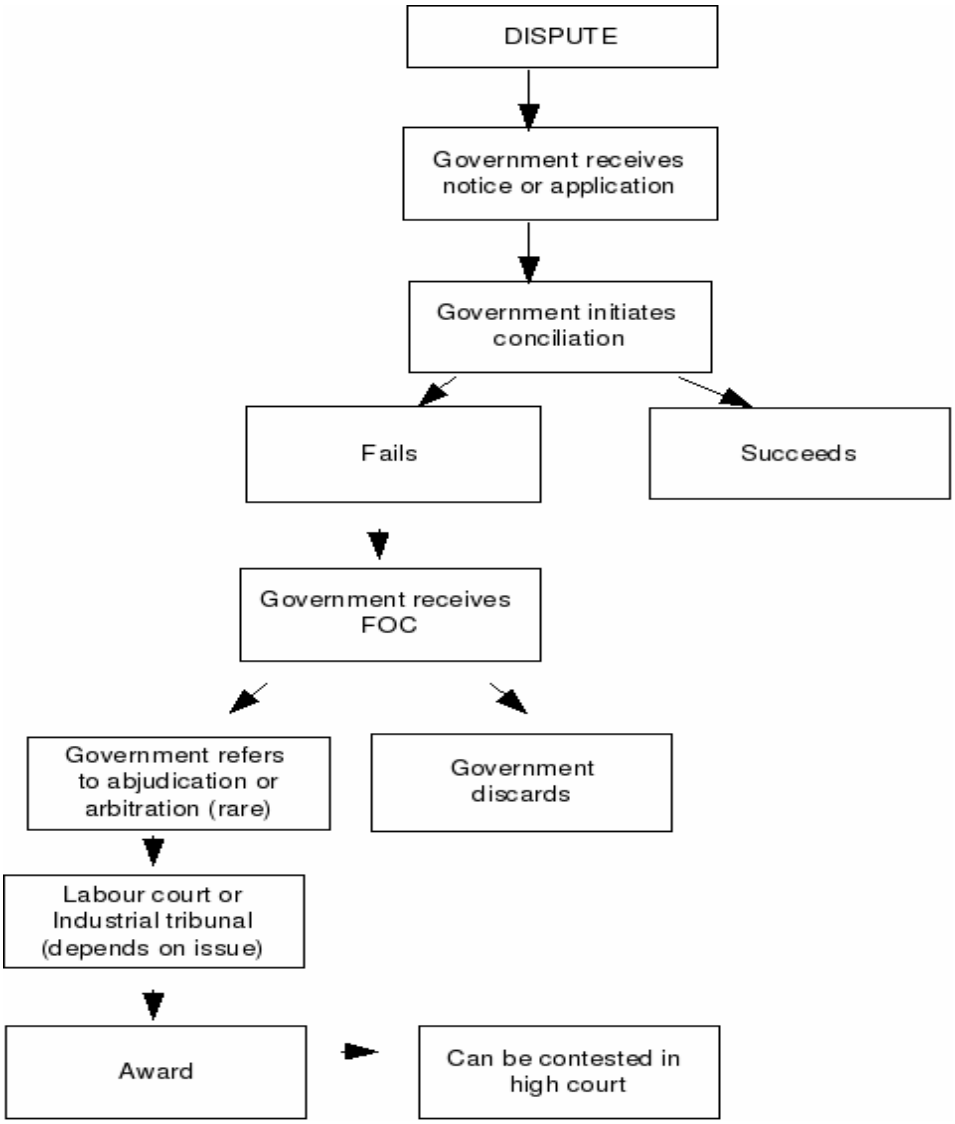
3.2 DISPUTE SETTLEMENT

Depending on the industry involved, the appropriate government for dealing with an industrial dispute is either the central or the state government (see e.g. Sen, 2003 for a detailed description).[9] The state government plays a decisive role, since, with the exception of a few states, only the government can refer a dispute for abjudication. The conciliation process, which is often the first step in dispute resolution, involves a third party in the form of a government conciliation officer or a board. The government should react to a dispute either in receipt of an application from the parties of the dispute or in the case of industries in the "public interest" immediately upon notification of a dispute. The process of conciliation may be circumvented if the worker or employer can apply directly for abjudication in court. This is possible in Tamil Nadu, Karnataka and West Bengal[10]; in the last two only since late 1980s. Based on various studies, Sen (2003) concludes that the conciliation or adjudication

machinery has failed to handle a large share of disputes in India; in late 1980s more than 50% of disputes were settled bilaterally or lapsed.

Figure 1 describes the dispute settlement process in the case that the individual parties do not apply for abjudication themselves. If the conciliation process fails, a failure of conciliation (FOC) report will be submitted to the appropriate government. The process of compulsory abjudication entails that all failed cases should in principle be referred to a Labour Court or Industrial Tribunal without delay. However, there are claims that in practice the government has not referred cases to abjudication on merit grounds despite this decision not being strictly in its domain (see Ghose in Sivananthiran and Ratnam, 2003) and that the process of referral can be extremely slow.

Figure 1 SETTLEMENT OF LABOUR DISPUTES



The regional and national Labour Courts and Tribunals are lower courts. The awards of Labour Courts and Industrial Tribunals are binding, and non-implementation is punishable under IDA Section 29 with a fine and imprisonment. However, labour Courts do not have the power to issue a decree for the implementation (see Shenoy in Sivananthiran and Ratnam, 2003). The awards may be contested in High Court or in the Supreme Court (see e.g. Sen, 2003). The exceptions are the states of Bihar and West Bengal, which have amended the IDA. Shenoy (as above) claims that awards have been challenged in High Court by employers, despite prosecution for non-implementation, and that in 2003, there were 2500 unimplemented awards alone in the Central government sphere that concerned 20000 workers. Workers often have inadequate resources to defend their cases in High Court, and this lack of resources is likely to give employers bargaining power over implementation. High court decisions come with considerable delays.[11]

3.3 INDICATORS FOR LABOUR LAW AND INDUSTRIAL RELATIONS CLIMATE

Due to the problems with implementation and possible political influence over the abjudication process, statutory legal change may only offer a partial picture of the legal framework behind industrial relations. Thus, the analysis in this paper is complemented with two indicators of dispute settlement in practice. This Section looks at the state level developments in the industrial disputes climate, dispute settlement and related regulation in India over the period 1979-1999 for which data can be obtained from available statistical sources.[12]

Two main indicators are used to portray the functioning of the industrial disputes settlement mechanism at the state level:

- *Court efficiency*: The ratio of the number of court awards in a year to the number of disputes abjudicated in the same year and
- *Pro-worker share*: The share of pro-worker awards out of total court (Labour Court or Industrial Tribunal) awards that year.

Time series data for the entire period on the number of cases pending in state Labour Courts are not readily available. The above-mentioned court efficiency variable is used as an alternative indicator. The correlation coefficient between the average value of this indicator for period 1997-1999 (not available for 2000) and that for the number of cases pending in state Labour Courts per population in year 2000 is -0.41. This is not negligible. The higher the court efficiency indicator, the lower is the number of cases pending in state Labour Courts. The

share of pro-worker awards is used as an indicator of judicial outcomes, or bias, in practice.

In addition to the two indicators, Table 1 shows the average values per state for the period 1979-1999 for the number of disputes that enter the industrial relations machinery in a year and the number of disputes abjudicated that year. The disputes that are referred for abjudication do not necessarily relate to those that enter the industrial relations machinery that year, but can also relate to previous disputes handled with a delay. It might be possible to construct other indicators of the legal process as well as the two mentioned above, but problems with interpretation can arise. For instance, the ratio of disputes referred to abjudication in the first place could be of interest, but a lower ratio could simultaneously reflect lax enforcement on the government's part, a better functioning conciliation mechanism or differences in the nature of the disputes.

TABLE 1 STATE-LEVEL INDUSTRIAL DISPUTES AND LEGAL INDICATORS: 1979-1999

	Mandays lost to strikes and lockouts/ worker		Total Disputes referred to IRM		Abjudicated disputes		Total awards		Pro-worker share		Court efficiency	
STATE	**MEAN**	**OBS**	**MEAN**	**OBS**	**MEAN**	**OBS**	**MEAN**	**OBS**	**MEAN**	**OBS**	**MEAN**	**OBS**
Andhra Pradesh	1.2	18	908	4	242	4	988	4	0.75	4	2.74	4
Assam	0.3	18	401	8	101	10	39	9	0.55	9	0.39	10
Bihar	1.1	18	682	4	126	4	97	4	0.66	4	1.88	4
Chandigarh	0.1	14	370	15	234	15	213	15	0.51	15	1.16	15
Delhi	0.8	16	7934	18	3969	18	711	18	0.59	18	0.19	18
Goa	2.1	18	329	15	58	15	32	14	0.57	13	0.50	14
Gujarat	0.5	18	4948	10	8329	10	4438	10	0.65	10	0.56	10
Haryana	0.9	18	4949	16	1619	16	835	16	0.47	15	0.62	16
Himachal Pradesh	0.5	17	278	12	71	12	92.8	12	0.64	12	1.70	11
Karnataka	1.0	18	2121	13	1095	13	642	13	0.71	13	0.79	13
Kerala	2.5	18	6382	15	477	15	320	15	0.68	15	0.73	15
Madhya Pradesh	0.2	18	656	7	310	7	79	4	0.86	3	0.24	4
Maharashtra	2.4	18	6022	13	2327	12	1599	13	0.46	13	0.70	12
Orissa	0.5	18	923	17	187	17	221	17	0.62	17	1.25	17
Punjab	0.6	18	8252	17	3592	17	2784	17	0.61	17	0.82	17
Rajasthan	1.4	18	2519	20	1454	20	827	13	0.63	13	0.60	13
Tamil Nadu	1.4	18	9308	17	1172	17	552	13	0.64	13	0.70	13
Uttar Pradesh	0.6	18	6920	3	3480	4	1728	4	0.58	4	0.55	4
West Bengal		0	7148	2	2124	2		0		0		0

Sources: Various issues of Indian Labour Statistics, Pocket Book of Labour Statistics and Indian Labour Year Book, Labour Bureau, Government of India, Shimla. Goa includes Daman and Diu up to the year 1988. All observations, including outlier values are included, which raises average levels in certain cases, e.g. court efficiency and abjudicated disputes. If the values are restricted between 0 and 1, the average value for court efficiency is 0.48. Most small states and Union territories are excluded, since they tend to have either no or very few dispute cases. Jammu and Kashmir is excluded due to lack of data. West Bengal also has inadequate data, but has amended the IDA actively (see Table 2). IRM = Industrial relations machinery. Court efficiency = ratio of number of awards to number of disputes abjudicated in the year, Pro-worker share = share of pro-worker awards out of all awards within a year. Workers in column 2 refer to organised sector (ASI) manufacturing workers.

Data quality is better for some states than others, since in some cases, the number of missing observations is too large for the state to be included in the analysis. Due to the presence of occasional missing observations and some outliers in the indicators on court efficiency and pro-worker awards, two parts of the analysis in this paper rely on three-year averages of these indicators, for the current and past two years. Another argument for using averages is that reactions to changes in the quality of dispute settlement are likely to come with a lag and perceptions to be built up over a course of recent years, not simply on the basis of the latest year. More on this matter follows in the Section on regression analysis.

Since time-series indicators on the dispute settlement process are missing for several states and it may be of interest to control for statutory change simultaneously, state amendments to the central IDA are also analysed. The central IDA is the benchmark and the amendments considered are deviations by states from the benchmark. Besley and Burgess (2004) have already coded state amendments to IDA as pro-worker or pro-employer. Bhattacharjea (2006) provides a critique of their approach. The way the state level statutory amendments are classified remains inevitably a matter on interpretation, but this paper proposes one alternative. It still resembles the one by Besley and Burgess to an extent. Ahsan and Pages have also offered an alternative reclassification.[13]

The decision on classification was guided by the nature of the state level amendments and the concerns with a lack of enforcement and inefficiency of the dispute settlement mechanism. From this perspective, it seems appropriate to divide the amendments into those that facilitate the dispute settlement process, grant more power to Labour Courts and aim to improve the implementation of awards ("enforcement acts") and those that aim to raise protection for workers against that of employers ("pro-worker acts"). Only those amendments that can be assigned to either category are considered here. Some of the amendments assigned to the two categories overlap. There are several amendments for which the bias or interpretation is not clear, and these are not included in the analysis. Thus, not all of the amendments included in the Besley-Burgess index are included here. Several of the amendments classified as enforcement amendments here were classified as pro-employer ones by Besley and Burgess.

The amendments included in either category are listed in Annex 1. It shows state amendments since the enactment of IDA (1947), although the regression analysis will only consider changes since the 1980s. An example of an "enforcement act" would be an amendment that allow for individual workers or

employers to apply directly to the Labour Court for abjudication, or an amendment that raises the punishment for non-implementation of awards. Only one amendment in West Bengal (1980) is such that it can be considered as posing a further impediment to the process. Others aim to improve the process. A pro-worker amendment would for instance be one that strengthens the workers rights in relation to closure of an undertaking or retrenchment and layoff and appropriate payment. A pro-employer amendment would for instance be one that while strengthening the legal process, is likely to impose larger barriers to the worker relative to the employer, such as a rise in the cost of dispute settlement.

A similar approach to that in Besley and Burgess (2004) is used to assign values for the changes to IDA; a value of 1 is assigned to an amendment that facilitates the process and a –1 to one that complicates it, and a similar strategy is used for pro-worker (1) and pro-employer amendments (-1). The final indicator is cumulative over time. Given the way in which the indicators are constructed, the emphasis shall be on the change, not the level. One evident critique of the approach is that not all of the changes will be of similar importance. Secondly, results can be sensitive to the chosen categorisation of each amendment. Thirdly, there is relatively little time variation in these indicators. No amendments took place in the 1990s, and over the period 1980-2000 amendments often cluster around a certain year in each state. Thus, the novelties of this paper relate to the indicators on the judicial process in practice.

Average values for the cumulative index for state-level amendments to IDA (coded as above) are shown for the period 1979-1999 in Table 2. This is also the period for which data on the settlement of disputes can be obtained. One amendment that is not in the central IDA, but that according to Bhattacharjea (2006) is directly relevant for the dispute settlement process is the 1983 amendment to Uttar Pradesh IDA (see Annex 1), and is thus included. State level amendments to IDA that fit our classification have taken place in 11 states out of those shown in Table 2 (most Union Territories and smallest states excluded). West Bengal is a clear outlier case, where amendments that suit our categorisation took place frequently in the 1980s.

TABLE 2 CUMULATIVE STATE AMENDMENTS TO IDA, AVERAGE VALUES: 1979-1999

	Enforcement Acts	Pro-worker Acts	Besley-Burgess, pro-worker
Andhra Pradesh	2.5	3.1	0.6
Assam	0	0	0
Bihar	0	0	0
Chandigarh	0	0	0
Delhi	0	0	0
Goa	0	0	0
Gujarat	0	2	1
Haryana	0	0	0
Himachal Pradesh	0	0	0
Karnataka	1.1	0.6	-0.6
Kerala	1	0	-2
Madhya Pradesh	0.9	0	-0.9
Maharashtra	0	0.9	3.5
Orissa	0	0.05	1.6
Punjab	0	0	0
Rajasthan	1.8	2.5	-1.0
Tamil Nadu	4.0	0	-1.7
Uttar Pradesh	0	-0.8	0
West Bengal	2.1	9.3	15.6

Main source for legal indicators: Manual on Labour and Industrial Laws, Commercial Law Publishers (India) Pvt. Ltd. The variables in this table include changes since 1947, but are averaged over 1979-1999, which is the period for which data on the court indicators is available. Negative values for the Besley and Burgess indicator refer to pro-employer orientation. The values for the Besley-Burgess indicator used here are those shown in the published paper (2004).

There is a positive, albeit not a strong correlation between pro-worker amendments to IDA and the share of pro-worker awards (Table 3). A strongly significant positive relationship between the two cannot be confirmed by a state-level fixed effects model with year dummies, but a significant relationship is found in such a model between enforcement amendments and court efficiency.[14]

As pointed out also by Besley and Burgess (2004) and others, the occurrence of strikes and lockouts, or mandays lost to strikes and lockouts, should also reveal something about the industrial relations climate in each state, although these figures do exhibit considerable variation from year to year. Table 1 shows figures on mandays lost to strikes and lockouts (in private and public industries) that fall under state jurisdiction in each state (scaled by total number of workers in registered/organised factories[15]). Interestingly, the correlation between the strike and lockout activity at the state level and state amendments to IDA is non-existent.[16]

TABLE 3 CORRELATION COEFFICIENTS (1979-1999)

	Court efficiency	Pro-worker share	Mandays lost (state)	Enforcement act	Pro-worker act
Court efficiency	1				
Pro-worker share	-0.01	1			
Mandays lost per worker (state)	-0.11	0.10	1		
IDA					
Enforcement act	0.13	0.17	0.05	1	
Pro-worker act	0.18	0.12	0.03	0.50	1

The correlations between pro-worker acts, enforcement acts and mandays lost are calculated for a larger sample, as data on the practical legal indicators has missing observations.

To relate our indicators to perceptions in practice, the state of Gujarat, a relatively industrial state, has a reputation as being tough on labour (see e.g. Hasan et al., 2007), whereas Kerala is considered a state where workers have a voice. This perception is not supported by the data on pro-worker amendments to the IDA (also a feature of the Besley and Burgess categorisation). However, Gujarat has a slightly lower average value for the share of pro-worker court awards and a clearly lower one for mandays lost to strikes and lockouts. It also has a lower value for court efficiency, which could signal that the dispute process is less relevant or the level of enforcement lower. These suggest that if common perceptions are reasonable, the practical indicators may give a more precise picture of practice than the statutory ones. On the other hand, as explained above, there is some correlation between IDA amendments and the court process indicators.

3.4 HYPOTHESES

This Section describes the general hypotheses associated with each of the legal indicators. Since the study uses several datasets to study different channels of effect, more specific hypotheses are presented when the empirical approaches and datasets are described.

The central hypothesis of this paper is that the variation between states, and over time, in dispute settlement and labour regulation affects the degree of formal work. This may occur via changes in firms' hiring patterns and productive and expansion plans, either via perception or anticipation. Reactions to judicial trends can occur with a time lag. The indicators on statutory change and judicial change in practice should be considered as complementary and to simplify matters, the hypotheses the same for both. However, it is possible that the significance of the two differs if for instance "law on the books" is not reflected in dispute settlement in practice.

Pro-worker share

The share of pro-worker awards out of total awards (pro-worker share) is used as an indicator of judicial orientation in practice. Pro-worker judicial change can lead to a higher threshold for a firm to hire a permanent rather than a temporary worker[17]. It could discourage small firm expansion, if it impedes the adjustment of labour input or the closing down of a firm. Such change may also raise the incentive for a worker to attempt to take a dispute to court.

A potential problem associated with this measure is that the outcome will also reflect the nature of the case, which is difficult to control for. However, if the industry of employment is controlled for in the forthcoming regressions, it may be that the nature of cases does not differ greatly between states. Thus, we require the assumption that cases tend to be on average of equal nature in each state or in a particular industry in each state.

Court efficiency

If state level variation in the efficiency of the dispute settlement process exists, we would expect to see differences in the degree of unresolved court cases. The relationships between formal work and efficient labour courts and legal change aiming to improve the quality of dispute settlement are a priori unclear. A high degree of unresolved cases can be a sign of irrelevance of the dispute settlement mechanism without much association with formal work. On the other it could also be considered a nuisance factor disrupting the conduct of business that discourages the expansion of formal work. If the legal system is perceived as inefficient, workers and employers might even be discouraged from taking or attempting to take legal action, be satisfied with a conciliation outcome, or even abstain from raising the dispute in the first place. Amendments that strengthen and facilitate the dispute settlement process could then lower the threshold for workers to force disputes into abjudication. However, such change would also simultaneously facilitate the process for the employer. Again, the assumptions made above about the nature of the cases may be required here as well.

Enforcement and pro-worker acts (IDA amendments)

The hypotheses for pro-worker amendments are the same as for the pro-worker court awards above. As above, the predictions on the effects of enforcement amendments are not a priori clear-cut. The relevance of statutory change may depend on the degree of enforcement in practice, which will be tested with the

use of an interaction term between the variables "pro-worker acts" and "court efficiency".

Evidently, efficient processes are likely to be associated with the level of state development in general, which the regression model will control for, but may also derive from political changes and attitudes for reform. Controlling for state political orientation is likely to be problematic. There are data limitations, but the main reason is that political orientation can be a partial explanation for variation in pro-worker judicial orientation or efficiency of dispute settlement, given the role played by the state in the mediation of disputes.

One concern that relates perhaps more to some of the judicial indicators than others is the possibility of reverse causality. Could pro-worker legal change or a higher share of pro-worker court outcomes reflect the growing power of workers in a state? Legislative change could potentially be more frequent and outcomes more pro-worker when the size of the formal sector grows. On the other hand, a valid counter-argument along the same lines would be that a rise in formal employment is potentially associated with a rise in firm size and thus firm power. Considering that states did not amend the IDA (or many other labour acts) at all at all in the 1990s, and that the process of enactment is slow, the concern may be unwarranted. Finding a set of instrumental variables for the set of judicial indicators is challenging. The paper nevertheless takes a careful stance and discusses relationships and associations rather than causality between the judicial indicators and outcomes of interest. The estimated models will control for the total number of disputes in addition to the judicial indicators. This can reflect the size of the formal sector, but its inclusion also controls for sudden fluctuations in the proneness for disputes, that do not relate to a conscious shift in court efficiency or pro-worker bias.

4 LABOUR REGULATION AND REGULAR EMPLOYMENT

4.1 DATA AND DESCRIPTIVE STATISTICS ON INDIAN WORKERS

This first part of the empirical analysis examines the relation between regular, salaried employment and the judicial process. The datasets on employment structure used in this study are four cross-sectional household employment surveys conducted by the National Sample Survey Organisation (NSSO). Comprehensive employment and unemployment surveys are carried out every five years and the ones used here, dictated by electronic access are those for the rounds 1983, 1987/88, 1993/94 and 1999/2000. The surveys are cross-sectional, so it is not possible to match households or individuals in consecutive surveys.

Individuals can be identified as employed on the basis of their principal or subsidiary usual activity status. The survey data are based on stratified sampling at the level of Indian districts, villages and household types. Within the strata, households are selected randomly. Population weights (multipliers) for households for obtaining nationally representative figures are included.

Workers, who are largely unprotected by law in India range from paid, or unpaid, self-employed workers to small firm employers. The degree of general protection varies by firm size, but even contract workers in organised sector firms may not be offered a similar level of social protection as permanent workers. Therefore, a relatively strict way of classifying workers into formal or informal would be to distinguish those workers who are permanent in an organised sector establishment from those who work for such as contract workers, or those who work solely for an unorganised establishment, or are self-employed.

However, prior to the NSSO employment survey of 1999/2000 (55th Round), the information on the type and size of establishment a person is employed in is not included. In all of the four cross-sectional employment datasets, those who can be considered as employed according to their principal usual activity status over the year, are classified as self-employed, casual workers and regular, salaried workers. These are mutually exclusive categories for principal activity. Self-employed are either unpaid household workers or own-account workers, and since 1993/94 a sub-category of employers for self-employed has also been added.

Most casual workers and self-employed are likely to fit our definition of an informal worker for the purposes of this paper (unless they are employers with large firms), since they are mainly uncovered by standard social security and job security provisions and many of the rights that can be disputed do not apply to them. This is certainly the case for self-employed, but casual workers are also very unlikely to be covered for instance by IDA job security provisions (Chapter V-B).

There is some variation, but the distribution of workers by nature of work in industry or services overall (or in the economy as a whole) has not changed considerably over the period 1983-1999. Table 4 shows the shares of those employed in different forms of employment in all activities, and separately for industry and services. Only those individuals whose principal activity over the past year was some form of employment are included. The share of casual workers on aggregate has risen slightly between 1983 and 1999. The share of

self-employed has declined slightly and that of regular workers increased slightly in industry if we compare the figures for 1983 and 1999. On the other hand, the share of regular workers has fallen somewhat in services. The relatively small changes between 1983-1999 reinforce the perception that the formal-informal divide persists.[18] Survey design has not changed considerably for the four rounds, and employment data should be comparable over time (see e.g. Thorat, 2004 for a similar argument). However, population multipliers (frequency weights) have been used in calculating the shares in Table 4 to improve comparability.

TABLE 4 EMPLOYMENT TYPE WHEN PRINCIPAL STATUS IS EMPLOYED (age 18-65), ***% shares***

	1983	1987	1993	1999
All workers				
Self-employed (own-account)	53.4	53.0	51.2	49.5
Regular, salaried workers	16.0	15.9	15.5	15.9
Casual workers	30.6	31.1	33.3	34.6
Total in sample	195,578	212,439	185,394	193,758
Industry				
Self-employed (own-account)	33.9	38.6	27.3	30.7
Employer			2.2	1.1
Unpaid worker in household enterprise	10.3	7.1	11.1	12.4
Total self-employed	44.2	45.6	40.6	44.2
Regular, salaried worker	34.5	33.2	36.9	35.7
Casual worker	21.3	21.2	22.5	20.1
Total in sample	25,459	26,874	22,644	24,561
Services				
Self-employed (own-account)	35.7	36.3	35.5	34.5
Employer			1.8	0.8
Unpaid worker in household enterprise	6.0	4.4	6.8	7.0
Total self-employed	41.7	40.7	44.1	42.2
Regular, salaried worker	42.7	39.0	38.3	36.8
Casual worker	15.6	20.3	17.6	21.0
Total in sample	55,064	65,550	63,696	73,411

Population multipliers (weights) are applied. Industry = Manufacturing, mining and water and electricity (3-digit NIC-98 categories 100-410). Services include construction, wholesale and retail trade, hotels and restaurants, transports, storage and communications, financial intermediation, real estate, education, health and other community and social services (3-digit NIC-98 categories 451 and above). Only those whose principal status is employment are considered. Including those who report employment as a subsidiary status would lead to some change in the shares of workers included in each employment category, but the development over time between different categories would be similar.

In the 1999/2000 survey 10 percent of all individuals aged between 18 and 65 are involved in regular wage-employment and 30 percent are self-employed either as own account workers, employers or unpaid household workers (see Table 5).[19] Almost 70 percent of all non-agricultural workers work in small proprietary or partnership firms (see Table 6). Only 7 percent of those who report employment as their principal status work in what can be considered as private organised or registered sector units (public limited companies, co-operative societies, private limited companies or other registered units with

above 10 employees) and 14 percent in the public or semi-public sector. 42 percent of all regular, salaried workers in non-agricultural activities, who report the number of workers in their workplace, work in a unit with less than 10 workers. Thus, in strict terms not every regular, salaried worker can be considered formal for our purposes, since not all of them will be covered by a majority of the labour acts. Most self-employed work in small units with less than 10 employees, and can be considered informal workers.

TABLE 5 PRINCIPAL USUAL ACTIVITY STATUS OVER PAST YEAR (age 18-65) 1999/2000
% shares

Employed	**Weighted**	**Un-weighted**
Self-employed	18.8	19.5
Employer	0.6	0.7
Unpaid household worker	10.4	10.3
Regular, salaried worker	9.6	12.0
Casual (public works) worker	0.1	0.2
Casual (other) worker	20.7	14.6
Total	60.2	57.3
Not employed		
Seeking work	1.6	2.0
Attended educational institution	3.7	5.1
Domestic duties only	19.5	21.2
Domestic duties and free collection of goods and work for household use	10.9	10.3
Pensioners, remittance recipients etc.	0.8	0.9
Disabled	0.7	0.7
Beggars, prostitutes	0.1	0.05
Others	2.5	2.6
Total	39.8	42.7
Total	406,047,979	358,304

Weighted = household multiplier used as weights.

TABLE 6 TYPE OF ENTERPRISE FOR NON-AGRICULTURAL WORKERS, 1999-2000
weighted % shares

	Industry and services
Proprietary, male	59.2
Proprietary, female	5.4
Partnership, household members	2.1
Partnership, with other households	1.5
Public sector	12.1
Semi-public	1.4
Public limited companies, co-operative societies, private limited companies, other ASI units	7.2
Not known	11.1
Sample total	104,396

The data is weighted by population weights. Figures are based on principal, usual activity status. ASI = Annual Survey of Industries. Industry = Manufacturing, mining and water and electricity (3-digit NIC-98 categories 100-410). Services include construction, wholesale and retail trade, hotels and restaurants, transports, storage and communications, financial intermediation, real estate, education, health and other community and social services (3-digit NIC-98 categories 451 and above).

4.2 FORMAL WORK AND INDIVIDUAL CHARACTERISTICS

Before moving on to a joint analysis of the four repeated cross-sectional datasets (Section 4.3), the 1999/2000 round is used briefly to gain some understanding of the correlates or determinants of an organised sector worker. These are compared with those of regular, salaried workers, since the latter are used to proxy for organised workers in the panel data analysis in Section 4.3. The previous rounds do not have information on the type of firms or establishments that workers are employed in. The 1999/2000 round includes 596,686 individuals.[20] The state-level judicial or other indicators are not yet included in these regressions, since the analysis is cross-sectional and the interest is in comparing the determinants of regular and organised workers and the role of individual attributes.

Following the discussion above, organised or formal workers are defined as those with a permanent and regular, salaried job in either a public, semi-public or other than an own-account and small firm. The last category includes co-operative societies, public limited companies, private limited companies and other registered units covered under the Annual Survey of Industries (ASI). This is not a precise definition of someone covered by IDA or labour legislation, since for instance the limits for some IDA provisions and social security legislation (such as the Employee's Provident Fund Act) vary by firm size. However, it will be used as an approximate definition to categorise both industrial and service-sector workers as either organised or unorganised (see Sakthivel and Joddar, 2006 for an alternative categorisation based on the 1999-

2000 NSSO sample survey). Table 7 shows the distribution of the labour force according to our chosen definition.

TABLE 7 PARTITION OF THE LABOUR FORCE, 1999/2000 survey

Services organised (So) 8.3%	Services unorganised (Su) 25.5%
Industry organised (Io) 1.8%	Industry unorganised (Iu) 9.9%
Agriculture (A) 50.9%	
Seeking work (U) 3.6%	

Labour force = those with principal status "employed" or "seeking work" between the age of 18-65. Population weights applied. Organised = regular, salaried workers with permanent employment in either a public, semi-public or other than an own-account and small firm.

Probit models are estimated to compare the determinants of organised as opposed to unorganised workers and regular, salaried workers as opposed irregular (self-employed and casual) workers. A multinomial logit model would be a more sophisticated option[21], but for simplicity a binary classification between formal and informal workers is preferred. The model takes the form:

$$(1) \qquad P(Io_i = 1 \mid \mathbf{X}, \mathbf{D_s}, \mathbf{D_{ind}}) = \phi(\mathbf{X_i'}\boldsymbol{\beta} + \mathbf{X_h'}\boldsymbol{\gamma} + \mathbf{D_s} + \mathbf{D_{ind}} + \varepsilon_i)$$

where *Io* (or alternatively So) is a binary variable for whether or not the individual is an organised industrial (or service So_i) sector worker, *i* refers to the individual, $\boldsymbol{X_i}$ represents characteristics of the individual, $\boldsymbol{X_h}$ those of the household (*h*) of the individual, and $\boldsymbol{D}_{ind}$ refers to a set of industry dummies (at 2-digit National Industrial Classification NIC-98 level) and $\boldsymbol{D}_s$ to a set of state dummies. The sample is restricted either to industrial workers or service workers depending on the dependent variable. Separate models are estimated for services and industry.

Table 8 shows the descriptive statistics for the largest sample used in the regressions. All individuals for whom relevant data is available and who work in either services or industry are included. The sample is restricted to individuals between the age of 18 and 65. The sample is weighted by population household multipliers (frequency weights) provided.[22] The individual characteristics controlled for include age, a gender dummy variable (male), dummy variables for the general level of education achieved, a dummy variable for married persons and a dummy variable for whether the person moved to the current location from another enumeration area within the last year. Mobility

could be a sign of wealth and choice, or equally the opposite, but could in principle affect employment type.

TABLE 8 SUMMARY STATISTICS: WORKERS IN INDUSTRY AND SERVICES, AGE 18-65, 1999/2000

Variable	Mean	Std. Dev.	Min.	Max.
Industrial workers (N = 24,537) **(NIC-98: 100-410)**				
Organised*	0.15	0.36	0	1
Regular	0.37	0.48	0	1
Service workers (N = 72,408) **(NIC 98: 451 and above)**				
Organised**	0.25	0.43	0	1
Regular	0.39	0.49	0	1
Individual characteristics (N = 96,945)				
Age	36.2	11.3	18	65
Married	0.77	0.42	0	1
Male	0.84	0.37	0	1
Moved (during past year)	0.03	0.17	0	1
Illiterate	0.19	0.40	0	1
Literate (without schooling)	0.09	0.29	0	1
Primary school	0.12	0.32	0	1
Middle school	0.17	0.38	0	1
Secondary school (lower and higher)	0.26	0.44	0	1
Higher degree (graduate and above)	0.16	0.37	0	1
Household characteristics (hh)				
Urban residence	0.64	0.48	0	1
Male head	0.93	0.26	0	1
Land possessed (hectares)	32.4	183.1	0	16288
Landless	0.23	0.42	0	1
No. of children (below age 18) in household	1.1	1.03	0	8
Scheduled tribe	0.07	0.26	0	1
Scheduled caste	0.15	0.35	0	1
Other backward class (OBC)	0.32	0.47	0	1
Hindu	0.76	0.43	0	1
Muslim	0.15	0.36	0	1
Christian	0.05	0.22	0	1
Sikh	0.02	0.14	0	1
Jain	0.01	0.08	0	1
Buddhist	0.01	0.09	0	1
Other religion	0.01	0.08	0	1

* Data missing for 2602 individuals
** Data missing for 9543 individuals

The sample is weighted by household multipliers and includes all individual between the age of 18-65 working in industry or services, for whom data is available. All individual and household characteristics except for age, land possessed and number of children are binary dummy variables. “Landless” is a dummy variable for no possession of land and the variable “moved” is a dummy for whether the person had moved to the enumeration area from elsewhere over the past year. The dummy variable “married” takes a value of 1 when the person is currently married and a 0 when the person has never been married, or is divorced or widowed. There are less observations for the variable “organised” worker than regular worker, because of missing observations for the variable describing whether employment is of a temporary or permanent nature. There are very few missing observations for other variables.

The household characteristics are the number of children (under age 18) in the household, religion dummies, dummy variables for lower caste status (scheduled caste, scheduled tribe and other backward classes), the gender of the household head (dummy for male head) and the amount of total land possessed (hectares) by the household. Lower caste status is expected to be associated with lower welfare levels and opportunities. Assets held could also affect employment status, which is why the amount of land possessed is included. A dummy for urban households is also included.

Table 9 shows the results of Probit models (1) for the probability of being an organised worker or a regular worker either in industry or services. Organised workers are likely to be older, more educated (the group illiterate is the baseline), male, have less children in the household and reside in urban areas. Those with a higher degree are 24 percentage points more likely to work in the organised industrial or service sector than illiterate individuals.

Lower caste status is not necessarily associated with a lower tendency for organised work with the exception of the other backward classes. It is possible that this somehow reflects job reservations for lower caste members in the public sector, but could also reflect unobservable characteristics. Hindus in general are 3-4 percentage points more likely and Christians 5-9 percentage points more likely to be organised sector workers than Muslims (the control group). Since this is a cross-sectional dataset, it is possible that some of the personal and household characteristics reflect other unobserved factors that are potentially better controlled for with a fixed effects panel data model in Section 4.3. The degree to which the differences arise from choice evidently cannot be ascertained here.

The category of regular workers is more heterogeneous than our defined category of organised workers. The results do reflect this to some extent, but the coefficients on a majority of the individual characteristics have similar signs as in the model for organised workers. This and the facts that social and educational factors are important determinants of regular or organised work are the messages to derive from this cross-sectional analysis.

TABLE 9 PROBIT MODELS FOR ORGANISED WORKER STATUS, 1999/2000
(*marginal effects*)

	Industry		Services	
Variable	**Organised**	**Regular, salaried**	**Organised**	**Regular, salaried**
Individual				
Age	0.002**	0.000**	0.005**	0.001**
Male	0.030**	0.152**	0.002**	0.021**
Married	0.025**	0.015**	0.030**	-0.043**
Moved	0.013**	0.077**	0.035**	0.087**
Literate (no schooling)	0.009**	0.053**	0.046**	0.100**
Primary school	0.021**	0.084**	0.083**	0.150**
Middle school	0.059**	0.140**	0.103**	0.205**
Secondary school	0.116**	0.197**	0.181**	0.271**
Higher degree	0.243**	0.258**	0.238**	0.243**
Household				
Urban	0.029**	0.134**	0.012**	0.093**
Male head	0.005**	-0.051**	-0.035**	-0.023**
Ln(Land possessed)	0.000**	0.002**	-0.002**	0.001**
Landless dummy	0.013**	0.133**	-0.003**	0.069**
No. of children	-0.005**	-0.022**	-0.008**	-0.011**
Hindu	0.035**	0.111**	0.026**	0.037**
Christian	0.087**	0.119**	0.053**	0.094**
Sikh	0.066**	0.009**	-0.013**	0.067**
Jain	-0.024**	-0.154**	-0.029**	-0.167**
Buddhist	0.077**	0.086**	0.005**	-0.081**
Other religion	0.068**	0.063**	-0.001*	0.035**
Scheduled tribe	0.003**	-0.035**	0.035**	-0.004**
Scheduled caste	-0.006**	-0.058**	0.016**	-0.043**
Other backward class (OBC)	-0.006**	-0.054**	-0.009**	-0.022**
Pseudo R-squared	0.39	0.30	0.56	0.45
Obs.	21,935	24,537	62,873	72,418

*, ** = significant at the 95 and 99% levels respectively

All models include state dummies and industry dummies at the two-digit NIC-98 level. Standard errors are corrected for heteroskedasticity. A logarithmic form of land possessed is used, with a zero in place of no land, which is controlled for with the dummy variable "landless". Excluded education category is "illiterate" and excluded religion category "Muslim".

4.3 ANALYSIS WITH PANEL OF REPEATED CROSS-SECTIONS

The choice of employment and hiring practices can depend on various unobserved individual, employer, or location, specific characteristics that are not necessarily easy to measure and control for. To introduce a time element and a way to control for the unobserved factors that potentially correlate with the judicial indicators, a panel dataset is constructed from the cross-sectional datasets based on the average values of variables for defined groups. This technique is commonly used in situations, where repeated cross-sectional micro-level data are available for a new representative sample each time. This is a common scenario in developing countries, where household level panel data is rarely available, but repeated cross-sections are. This Section describes this modelling approach, the data and the results. Annex 2 describes the features of the modelling approach in more detail and possible shortcomings.

In order to incorporate a panel dimension, individuals between the age of 20-49 in the 1983 survey are divided into six groups, each spanning five years. In the next cross-section (1987), the individuals of interest are aged between 24-53. These six cohorts are further divided by state of residence, education (four groups, see Table 10)[23] and gender. A group in this study thus consists of individuals born within the same 5-year period, who live in the same state and have the same level of education and same gender. These groups form the fixed-effect unit. Individuals in each group are assumed to share common unobserved characteristics that differ from those of other groups.[24]

The main modelling assumption is that given a representative sample, group averages will be unbiased and the fixed, unobserved characteristics of each group remain unchanged across cross-sections (see Annex 2 for details). A potential problem with grouping individuals by state is that the underlying population in the state is likely to change and therefore the group size in the sample would change. The state dimension is required for linking the judicial indicators to the data. However, mobility between Indian states appears to be low. The 1999/2000 sample reveals that 2 percent of the population falling within the age cohorts of this study had migrated from one state to another in the last 16 years.

TABLE 10 SUMMARY STATISTICS FOR EMPLOYMENT PANEL DATASET (*group data*)

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Manufacturing worker	3135	0.08	0.07	0	0.48
Service worker	3135	0.22	0.20	0	0.95
Agricultural worker	3135	0.32	0.26	0	0.89
Regular, salaried manufacturing worker	3135	0.03	0.05	0	0.47
Regular, salaried service worker	3135	0.12	0.16	0	0.78
Casual worker	3135	0.04	0.05	0	0.65
Self-employed	3135	0.11	0.10	0	0.67
Not employed	3135	0.38	0.36	0	1
Other group characteristics					
Age	3135	41.3	10.5	21.3	64.5
Illiterate	3135	0.27	0.44	0	1
Literate without primary education	3135	0.23	0.42	0	1
Primary or middle school education	3135	0.26	0.44	0	1
Secondary school or above	3135	0.25	0.43	0	1
Male	3135	0.52	0.50	0	1
Married	3135	0.87	0.14	0.03	1
Urban	3135	0.36	0.25	0	1
No. of children in household	3135	2.24	0.91	0.20	5.36
Male head	3135	0.93	0.08	0.52	1
Land possessed (ha)	3135	57.5	58.7	0.13	564.8
Scheduled tribe	3135	0.06	0.08	0	0.46
Scheduled caste	3135	0.14	0.11	0	0.59
Hindu	3135	0.82	0.15	0.16	1
Muslim	3135	0.10	0.11	0	0.81
Christian	3135	0.03	0.07	0	0.56
Sikh	3135	0.04	0.14	0	0.80
Jain	3135	0.01	0.02	0	0.28
Buddhist	3135	0.00	0.01	0	0.15
Other religion	3135	0.00	0.01	0	0.09
Labour regulation and other state indicators					
Enforcement acts	3135	0.85	1.35	0	5.0
Pro-worker acts	3135	1.15	2.56	-1.0	11.0
Total disputes (3-year mean)	2290	3884	3391	86	12590
Court efficiency (3-year mean)	2110	0.73	0.74	0	4.7
Pro-worker share (3-year mean)	2105	0.60	0.17	0	0.9
Real GDP per capita (1993 prices)	3135	8708	4350	2300	29961
Population per commercial Banks (000s)	3135	13.8	4.5	4.0	30.0
Individuals in group	3135	215.6	238.4	20.0	2303

Household multipliers used as weights (rounded to nearest whole number). The states included in the original sample were Andhra Pradesh, Assam, Bihar, Chandigarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. Goa includes Daman and Diu up to the year 1988. Sufficient data on the court process indicators, or state-level indicators, is missing for Andhra Pradesh, Chandigarh, Madhya Pradesh, Uttar Pradesh and West Bengal. The smallest states and territories are excluded as they do not have Labour Courts and have very few dispute cases. Population for 1983 and 1987 are those from 1981 and 1991 Censuses respectively and for 1993 and 1999 from 2001 Census. A few industries are not included when the variables for shares working in each 2-digit (NIC-87) industry are defined. This is due to conversion problems resulting from several changes in the industry codes over the time period. The data on commercial banks is for years 1983, 1988, 1993 and 2000.

Once groups with less than 20 individuals and the smallest states are excluded, we have a maximum of 870 fixed effects groups based on years of birth, education, gender and state observed over a 16-year period (4 cross-sections). Groups with less than 20 individuals are excluded on the basis that they are unlikely to be representative. A large share of these observations belongs to smaller states or Union territories, which will in any case be excluded from the analysis due to unavailability or irrelevance of legal data. In terms of the final selection of sample and states, 15 percent of observations are lost due to the presence of less than 20 individuals per group. The average group size in the final sample is 220 individuals and it varies between the minimum of 20 and the maximum of 2303. The basic sample for which the group averages are identified and regressions run includes every individual falling into the group, regardless of whether he or she works or not. The panel is unbalanced, since the labour regulation indicators or a few other indicators may be missing for a few states, or groups, for a few years.

The main hypothesis tested is that the judicial indicators affect the share of regular workers in industry and services. In the absence of precise figures on the shares of organised workers over time, regular, salaried workers are used as an approximation of formal workers. Self-employed and casual workers are thus considered informal.

The estimated model with group (g) fixed effects is

$$(2)\quad \bar{y}_{gt} = \alpha_g + \bar{\mathbf{x}}'_{gt}\boldsymbol{\beta} + \mathbf{Z}'_{st}\boldsymbol{\gamma} + \mathbf{D}_t + \mathbf{S}_t + \bar{\varepsilon}_{gt}, \quad g = 1,...,G; \quad t = 1,...,T$$

where $\bar{y}_{gt}$ is the share of the group with regular, salaried employment in industry or services, $\bar{X}_{gt}$ is a vector of group-specific variables (averaged across the group), $\boldsymbol{Z_{st}}$ a vector of state-specific judicial and other variables, α_g is the group-specific fixed effect, $\boldsymbol{D_t}$ refers to a set of year dummies and $\boldsymbol{S_t}$ to state-specific trends. As explained, some sections of IDA and some other labour acts do not apply to many service sector activities, but service sector work is nevertheless analysed separately with the same hypotheses as for industrial sector work. The explanatory variables are defined as in the cross-sectional study, but in this case represent group-averages. This means that group characteristics represent fractions of the group with a certain characteristic.[25] The standard errors are corrected for state-level clustering.

The models control for the general level of employment by including the share of individuals in the group who are without work. They also include indicators for the shares working in agriculture and either in services or industry

depending on the dependent variable, and indicators for the shares of individuals working for a certain two-digit (NIC-98) industry/service sector. The latter control for industry-specific factors, which are otherwise difficult to incorporate into such a panel data framework, such as the impact of trade liberalisation on industrial composition. They proved to be statistically significant. State-specific trends capture unobserved, state-specific changes over time. Given the short time dimension, the latter might remove important variation attributed to other variables, but the significance of the control variables is not much affected by the inclusion of these trends.

Group-specific control variables are lower caste status (indicator for either scheduled tribe or caste), marital status, number of children, male head of household, urban dummy and amount of land possessed. It is important to control for age, since the average age of the individuals in the groups examined rises over the 16-year period and is thus likely to affect the nature of employment. Only certain groups of individuals are tracked and thus the average age in the sample is higher in the latter years.[26]

A few state level indicators are included to capture the general level of development and together with the state-specific trends, reduce potential omitted variable bias on the state-level judicial variables. These include state level GDP per capita in constant 1993 prices and population per number of commercial banks.[27]

The state-level judicial indicators included are the cumulative IDA indicators, court efficiency, pro-worker share, and the total number of disputes that enter the industrial relations machinery (IRM). Additionally, an interaction term between the pro-worker IDA amendments and the court efficiency indicator is included in one specification to test if the significance of pro-worker amendments varies by the degree of judicial efficiency. Since all actual state-level amendments to IDA were made in the 1980s, there is no change in the IDA indicators between 1993 and 1999.

The indicators of the court process in practice enter the regressions as three-year means (averages over the current and past two years) of the indicators for the court process.[28] This raises the number of observations that can be used and mitigates possible outlier effects. Logarithmic form for court efficiency and the total number of disputes is used to further mitigate the effect of outliers, which are more remarkable for these than the variable for pro-worker share. We might be concerned that a larger absolute number of total disputes could result from a higher degree of formality and not vice versa and result in a bias. However, as

mentioned it may be important to control for general fluctuations in the proneness to disputes, which may not reflect any conscious effort to alter the court process. Due to some outlier values in the number of abjudicated cases, the total number of disputes raised is used instead. This is merely a control variable throughout.

Seven models are estimated for both industry and services. The difference between the models relates to the set of judicial variables included. Firstly, four models that include one judicial indicator at a time are estimated. These are followed by three models that include the variables for court efficiency and pro-worker court outcomes and either one of the indicators for IDA amendments. Due to a relatively high degree of correlation, the two indicators for IDA amendments are not included in the same model. The final model includes an interaction term between pro-worker acts and the court efficiency indicator instead of either one of the IDA amendment variables. Sample size varies depending on the indicators included.

Table 10 shows descriptive statistics for the largest sample used in the regression analysis. The values in each survey are weighted using given household multipliers.

Table 11 shows the results for the share of regular, industrial workers and Table 12 those for regular, service-sector workers. As in the cross-sectional model (Table 9) urban residence and hindu religion are associated with a higher share of regular, industrial workers. With one exception, the judicial indicators are insignificant in the case of regular, industrial workers. The exception is the negative coefficient for enforcement IDA acts. One enforcement amendment is associated with a 0.2 percentage point fall in the share of regular industrial workers. However, the variable is not significant in Model 6, which also includes other judicial indicators. The interaction term between pro-worker acts and court efficiency in insignificant.

In the case of services (Table 12), the group-characteristics are not highly significant. Enforcement amendments are not statistically significant, but pro-worker amendments have a significantly negative coefficient in one model specification, which also includes the court process indicators. One pro-worker amendment is associated with a 0.7 percentage point lower share of regular workers. However, pro-worker amendments are not significant when included in a model without the court process indicators. Thus, the evidence for a negative relationship between pro-worker or enforcement IDA amendments and the share of regular, service sector work is weak. Additionally, the share of pro-

worker awards has a significantly positive relationship with regular, service sector work. A 10 percentage point rise is related to a 0.2-0.3 percentage point rise in the share of regular workers.[29]

To conclude, the evidence for a negative relation between regular employment and enforcement amendments is weak, and such a relationship does not hold for court efficiency, which is the indicator for enforcement in practice. The relation between pro-worker orientation and regular employment is even more ambiguous. The coefficient on the share of pro-worker awards is significantly positive in several specifications for regular, service sector work. That on pro-worker IDA amendments is negative for regular, service sector work, but only weakly so and in one specification that includes the other judicial indicators as well. Additionally, the coefficients for the IDA indicators become insignificant if one period lags of the IDA indicators are used (not shown). Thus, the analysis does not lead to robust conclusions, and the relationship between judicial change and the irregular-regular employment divide does not appear to be a clear-cut one.

TABLE 11 SHARE OF GROUP WORKING AS REGULAR, SALARIED INDUSTRIAL

	1	2	3	4	5	6	7
Age	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	[0.002]	[0.002]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Age^2	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Married	0.006	0.006	0.002	0.001	0.002	0.002	0.002
	[0.005]	[0.005]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]
No. of children	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	[0.001]	[0.001]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Ln(Land possessed)	0.004	0.004	0.005	0.005	0.005	0.005	0.005
	[0.001]**	[0.001]**	[0.001]**	[0.001]**	[0.002]**	[0.002]**	[0.002]**
Male head	0.019	0.019	0.021	0.022	0.022	0.021	0.021
	[0.017]	[0.017]	[0.022]	[0.020]	[0.022]	[0.022]	[0.022]
Not working	-0.294	-0.294	-0.327	-0.332	-0.327	-0.326	-0.326
	[0.053]**	[0.053]**	[0.074]**	[0.073]**	[0.074]**	[0.074]**	[0.074]**
Service worker	-0.282	-0.282	-0.315	-0.321	-0.315	-0.315	-0.314
	[0.051]**	[0.051]**	[0.070]**	[0.069]**	[0.071]**	[0.071]**	[0.070]**
Agricultural worker	-0.279	-0.279	-0.306	-0.308	-0.306	-0.305	-0.305
	[0.054]**	[0.054]**	[0.078]**	[0.076]**	[0.078]**	[0.078]**	[0.078]**
Urban	0.022	0.022	0.028	0.027	0.028	0.029	0.028
	[0.008]**	[0.008]**	[0.010]*	[0.010]*	[0.010]*	[0.010]**	[0.010]*
Hindu	0.027	0.027	0.034	0.036	0.034	0.034	0.035
	[0.012]*	[0.012]*	[0.020]x	[0.019]x	[0.020]	[0.020]	[0.020]x
Christian	0.041	0.041	0.048	0.050	0.049	0.048	0.049
	[0.015]*	[0.015]*	[0.028]	[0.027]x	[0.028]	[0.028]	[0.028]
Scheduled tribe	-0.001	-0.001	0.013	0.001	0.014	0.015	0.013
	[0.015]	[0.015]	[0.023]	[0.028]	[0.023]	[0.022]	[0.022]
Scheduled caste	-0.010	-0.010	-0.012	-0.010	-0.012	-0.012	-0.012
	[0.009]	[0.009]	[0.012]	[0.011]	[0.012]	[0.012]	[0.012]
Labour regulation							
Pro-worker acts	-0.001				-0.002		
	[0.001]				[0.003]		
Enforcement acts		-0.002				-0.005	
		[0.001]*				[0.004]	
Ln(Court efficiency)			0.002		0.002	0.003	0.002
(mean)			[0.002]		[0.002]	[0.002]	[0.002]
Pro-worker share				0.000	-0.002	-0.004	-0.004
(mean)				[0.016]	[0.015]	[0.014]	[0.015]
Ln(Total disputes)			-0.002	-0.000	-0.002	-0.002	-0.002
(mean)			[0.003]	[0.004]	[0.004]	[0.005]	[0.004]
Ln(Court efficiency)*							0.002
Pro-worker acts							[0.002]
State controls							
Ln(GDP per capita)	-0.014	-0.015	0.013	0.002	0.001	0.001	0.014
	[0.007]x	[0.006]*	[0.025]	[0.024]	[0.030]	[0.023]	[0.027]
Population/banks	-0.000	-0.000	0.001	0.000	0.001	0.000	0.000
	[0.000]	[0.000]	[0.001]	[0.002]	[0.002]	[0.001]	[0.002]
Constant	-1.328	-1.466	-0.542	-0.745	-1.319	-1.307	-0.338
	[3.287]	[3.257]	[5.590]	[5.653]	[5.700]	[5.449]	[5.615]
Observations	3135	3135	2016	2057	2016	2016	2016
Number of groups	844	844	710	710	710	710	710
R-squared (within)	0.68	0.68	0.69	0.68	0.69	0.69	0.69

x = significant at 90%; ** significant at 95%; *** significant at 99%. Standard errors in parentheses are corrected for heteroskedasticity and serial correlation and clustering by state. All regressions include group fixed effects. Groups are based on year of birth, gender, education and state. All models include state-specific trends and separate variables on the shares working in each industry (at the 2-digit NIC-level). Dummies for all religion categories are included, but to conserve space, only those with a statistically significant coefficient are shown. Excluded education dummy is "illiterate" and excluded religion dummy "Muslim". The variables "pro-worker share" and "court efficiency" are 3-year averages. The data for each survey sample has been weighted by available population multipliers.

TABLE 12 SHARE OF GROUP WORKING AS REGULAR, SALARIED WORKERS IN SERVICES

Group characteristics	1	2	3	4	5	6	7
Age	-0.001	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001
	[0.002]	[0.002]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Age^2	-0.000	-0.000	-0.000	0.000	-0.000	-0.000	-0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Married	-0.013	-0.013	-0.019	-0.018	-0.020	-0.019	-0.019
	[0.008]	[0.008]	[0.011]x	[0.011]	[0.011]x	[0.011]	[0.011]x
No. of children	0.001	0.001	0.000	0.001	0.001	0.001	0.001
	[0.001]	[0.001]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Ln(Land possessed)	0.000	0.000	-0.000	-0.000	-0.001	-0.000	-0.001
	[0.001]	[0.001]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Male head	0.008	0.008	0.008	0.010	0.009	0.008	0.009
	[0.012]	[0.012]	[0.012]	[0.011]	[0.013]	[0.012]	[0.012]
Not working	-0.193	-0.192	-0.251	-0.250	-0.247	-0.249	-0.247
	[0.116]	[0.116]	[0.188]	[0.189]	[0.192]	[0.189]	[0.190]
Manufacturing worker	-0.169	-0.168	-0.207	-0.205	-0.200	-0.203	-0.201
	[0.101]	[0.101]	[0.171]	[0.172]	[0.173]	[0.172]	[0.172]
Agricultural worker	-0.177	-0.176	-0.230	-0.231	-0.226	-0.229	-0.227
	[0.123]	[0.123]	[0.197]	[0.198]	[0.200]	[0.198]	[0.199]
Urban	0.002	0.002	0.002	0.003	0.003	0.002	0.002
	[0.010]	[0.010]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]
Hindu	0.044	0.044	0.069	0.070	0.068	0.068	0.068
	[0.027]	[0.027]	[0.037]x	[0.038]x	[0.037]x	[0.037]x	[0.037]x
Christian	0.056	0.056	0.083	0.083	0.084	0.082	0.081
	[0.035]	[0.035]	[0.048]	[0.045]x	[0.046]x	[0.046]x	[0.047]
Buddhist	0.151	0.151	0.190	0.138	0.181	0.173	0.176
	[0.047]**	[0.047]**	[0.061]**	[0.050]*	[0.060]**	[0.059]*	[0.060]*
Scheduled tribe	0.023	0.023	-0.006	0.002	-0.003	-0.002	-0.003
	[0.017]	[0.017]	[0.023]	[0.022]	[0.024]	[0.023]	[0.024]
Scheduled caste	-0.014	-0.015	-0.012	-0.016	-0.011	-0.011	-0.011
	[0.019]	[0.019]	[0.024]	[0.027]	[0.024]	[0.024]	[0.023]
Labour regulation							
Pro-worker acts	-0.001				-0.007		
	[0.000]				[0.004]x		
Enforcement acts		-0.001				-0.003	
		[0.001]				[0.005]	
Ln(Court efficiency)			-0.002		-0.001	-0.002	-0.001
(mean)			[0.002]		[0.001]	[0.002]	[0.001]
Pro-worker share				0.023	0.025	0.022	0.024
(mean)				[0.013]x	[0.013]x	[0.014]	[0.014]
Ln(Total disputes)			-0.001	0.005	0.005	0.004	0.004
(mean)			[0.004]	[0.002]*	[0.003]	[0.002]x	[0.002]
Ln(Court efficiency)*							-0.002
Pro-worker acts							[0.002]
State controls							
Ln(GDP per capita)	-0.003	-0.003	-0.030	0.010	-0.029	-0.006	-0.006
	[0.008]	[0.008]	[0.031]	[0.025]	[0.037]	[0.020]	[0.028]
Population/banks	0.000	-0.000	0.002	0.003	0.004	0.003	0.004
	[0.000]	[0.000]	[0.002]	[0.002]	[0.002]*	[0.003]	[0.003]
Constant	-1.753	-1.854	-3.242	-2.037	-5.646	-3.826	-3.537
	[4.354]	[4.367]	[6.374]	[5.320]	[7.162]	[6.196]	[5.800]
Observations	3135	3135	2016	2057	2016	2016	2016
Number of groups	844	844	710	710	710	710	710
R-squared (within)	0.93	0.93	0.91	0.92	0.92	0.91	0.91

Notes as above in Table 11.

In an attempt to shed more light on pro-worker change, further models with varying outcomes of interest were estimated. Models with pro-worker amendments as the only judicial indicator are presented in the first row of Table 13 (Model 1). Pro-worker amendments have no relation with the share of industrial, service or agricultural workers, or with the share of self-employed in the entire industrial or service sector. However, they are associated significantly positively with the share in casual work in the entire industrial and service sectors combined. Again, the results on casual employment and self-employed are sensitive to whether current of lagged IDA indicators are included. The same models, where the pro-worker IDA indicator is replaced with enforcement IDA indicator show no relation between enforcement amendments and the different outcomes (Model 2 of Table 13). If instead of the IDA amendments, the indicators on the court process in practice are included, the only significant relation is a negative one between the share of pro-worker awards and self-employment in the service and industrial sectors combined (Model 3 in Table 13).

TABLE 13 ROBUSTNESS CHECKS: JUDICIAL CHANGE AND EMPLOYMENT TYPE

	Casual (industry & service)	**Self-employed (industry & service)**	**Industry**	**Services**	**Agriculture**
Model 1					
Pro-worker acts	0.002	-0.000	0.004	-0.000	-0.003
	[0.001]*	[0.001]	[0.002]	[0.002]	[0.002]
Model 2					
Enforcement acts	0.003	0.001	0.003	-0.000	-0.003
	[0.002]	[0.002]	[0.002]	[0.003]	[0.002]
Obs.	3135	3135	3135	3135	3135
Model 3					
Pro-worker share (mean)	0.004	-0.052	-0.041	-0.079	0.034
	[0.024]	[0.020]*	[0.029]	[0.091]	[0.023]
Ln(Court efficiency)	-0.001	0.001	-0.001	-0.006	0.002
(mean)	[0.002]	[0.002]	[0.002]	[0.004]	[0.002]
Ln(Total disputes) (mean)	0.004	-0.013	-0.021	-0.029	0.019
	[0.005]	[0.004]**	[0.008]*	[0.016]x	[0.007]*
Obs.	2016	2016	2016	2016	2016
R-squared (within)	0.59	0.66	0.32	0.64	0.71

Notes as above in Table 11. The only legal indicator in Model 1 is "pro-worker acts" and in Model 2 "enforcement acts". Model 3 refers to models that include the court process, but not the IDA indicators. The explanatory variables are the same as in Tables 11 and 12. All regressions control for the share of the group not working. The models "Casual" and "Self-employed" include the variables for the shares of the group working in each sector (2-digit NIC). The models "Industry" and "Agriculture" control for the share working in services and the model "Services" for the share working in industry. All regressions include group fixed effects.

Thus, the relationships remain ambiguous with indicators on statutory change and the court process in practice pointing at times at different directions. The results on the IDA indicators are somewhat sensitive to specification. However, one might argue that given the short panel dimension, the inconclusiveness could be attributed for instance to a lack of time variation. An alternative analysis with a panel data set constructed by pooling the four cross-sectional surveys together was also estimated. Logit models for regular versus irregular work were estimated separately for industrial and service workers, either with a sample restricted to such workers, or all working-aged individuals. The interest here was in cross-sectional variation, but there is arguably more scope for omitted variable bias, although state-specific dummy variables were included. Additionally, the interpretation for cumulative IDA amendments is cross-sectional, whereas the primary aim of this paper was to concentrate on the changes to IDA. The results of this exercise are not presented, but the judicial variables were hardly more statistically significant than in the panel data analysis. Additionally, similar problems with sensitivity to specification and indicator remained. Final conclusions on the relationship between the judicial indicators and informality are presented after the complementary analysis of Section 5.

5 LABOUR LAW AND THE LINKS BETWEEN ORGANISED AND UNORGANISED SECTORS

This Section analyses briefly the relationship between the judicial indicators and two outcomes: social security contributions by organised sector employers and the tendency of unorganised firms to produce for a contractor, which is often a larger, organised firm. In both cases, the focus is on industry or manufacturing, mainly due to data availability. Social security coverage in the organised manufacturing sector is used as a proxy for the degree to which such firms rely on casual or contractual workers within an industry. The first part involves the use of a standard industry-state level panel dataset (5.1). The second part relies on a cross-sectional survey of unorganised sector manufacturing units (5.2).

5.1 LABOUR REGULATION AND SOCIAL SECURITY IN ORGANISED MANUFACTURING

The organised, manufacturing sector data used in the analysis come from the Annual Survey of Industries (ASI). According to the Ministry of Statistics and Programme Implementation, the Annual Survey of Industries “is the principal

source of industrial statistics in India. It provides statistical information…of organised manufacturing sector comprising activities related to manufacturing processes, repair services, gas and water supply and cold storage. It covers all factories registered under Sections 2m(i) and 2m(ii) of the Factories Act, 1948 i.e. those factories employing 10 or more workers using power; and those employing 20 or more workers without using power".[30]

The ASI data are available at different levels of precision, and the dataset used here is an annual panel dataset, where the unit of observation is a 3-digit industry (NIC-87) at the state-level for the years 1980-1997. The electronic version of the data does not include actual figures separately for contract workers and permanent workers. At this degree of precision, such figures are electronically available only from the year 1999. Thus, it is argued here that within-industry changes in employer's social security contributions as a ratio of the total wage bill can function as a proxy indicator for the share of permanent as opposed to contract workers in an organised sector manufacturing industry.

Social security arrangements such as the Employees' Provident Fund and Employees' State Insurance schemes cover establishments that employ respectively above 20 or 10 workers. Provident fund payments on both the employer's and employee's part are directly proportional to the wages of the employee (currently at 12% for the employer).[31] The principal employer (employer in our data) is responsible for paying both the employer's contribution and the employee's contribution also in the case of workers employed through a contractor. However, these payments are then to be claimed from the contractor (see Contract Labour (Regulation and Abolition) Act, 1970). Social and other facilities are also primarily the responsibility of the contractor. As mentioned earlier, contract workers are generally not protected by the job security provisions in IDA. Survey evidence by Rajeev (2006) shows that the provisions in the Contract Labour Act are often violated, contract workers are often excluded from the Provident Fund and other social benefits that they would be entitled to and collusion between official inspectors and employers is common. Although contract workers should legally be entitled to similar wages than equivalent permanent workers, survey evidence also reveals that wages for contract workers in organised firms are lower than those for permanent workers after controlling for worker-specific characteristics, and can be below the minimum wage (Bhandari and Heshmati, 2006).

The NSSO 1999/2000 household survey data used above also support the claim that it is uncommon for other than permanent organised sector workers to be covered by the Provident Fund (see Table 14). This suggests that, although

official records of organised firms should cover provident fund for all workers, workers on contract may not be covered. This evidence supports the use of employers' social contributions as a share of the wage bill as a proxy for the share of permanent as opposed to contract or casual workers in organised sector firms. The indicator used may not be indicative of between industry differences, but since the estimated models include industry fixed-effects, it is the within-industry change that is of main interest.

TABLE 14 PROVIDENT FUND COVERAGE FOR NON-AGRICULTURAL WORKERS

	All industry and services	Public, semi-public and ASI firm workers		All industry and services	
	All workers	Permanent and regular, salaried	Temporary or casual	Permanent and regular, salaried	Temporary or casual
	Percent	Percent	Percent	Percent	Percent
Yes	22.4	90.4	11.7	74.7	3.1
No	74.0	9.3	85.5	24.8	94.0
Missing	3.6	0.3	2.8	0.5	2.9
Total obs.	104,359	19,147	4,284	28,839	37,034

Data source: NSSO 55th Round Household Employment and Unemployment Survey (1999-2000). Worker is anyone whose principal status involves a form of employment. ASI firm includes co-operative societies, public limited companies, private limited companies and other units covered under Annual Survey of Industries.

Further support can be obtained from ASI data for 1999-2002 (state-industry level), for which the exact number of contract workers is available. The regression results in Table 15 below show that the ratio of all other workers to contract workers can be explained by the ratio of employer's social security contributions to total wages (emoluments), controlling for industry (3-digit NIC-98) and state dummies. The higher is the share of permanent, or other than contract workers, the higher is the ratio. The data on the social security payments includes old age benefits, provident fund and other funds and welfare expenses. Due to changes in the reporting of employer's social contributions over the period examined, provident fund payments alone cannot be examined. Even if a fraction of contract workers lawfully receive their share of provident fund, other social benefits and their payments are likely to be lower for the principal employer, the higher the degree of temporary, contract workers, since these can be partly the responsibility of the contractor. The payment of wages is primarily the responsibility of the contractor (Section 21 of Contract Labour Act).

TABLE 15 CONTRACT WORKERS AND EMPLOYER'S SOCIAL CONTRIBUTIONS, 1999-2002

	OLS	Fixed effects (state-industry)
	Ln(Other workers/ contract workers)	**Ln(Other workers/ contract workers)**
Ln(Employer's social contributions/Total wages and salaries)	0.599	0.409
	(0.066)**	(0.080)**
Constant	-3.677	-2.828
	(0.323)**	(0.156)**
Observations	3417	3417
Number of state x NIC		1085
R-squared	0.30	0.05
Year dummies	YES	YES
State and industry dummies	YES	NO

** = significant at 99% level. Data source: Annual Survey of Industries 1999/00-2002/03 (State x 3-digit NIC-98). Standard errors, corrected for heteroskedasticity and autocorrelation, are shown in parentheses. "Other workers" refers to all other employees than contract workers. Observations with an outlier value above 100 for the dependent variable (top 5% percent) are excluded. Otherwise all available observations are used.

Industrial Tribunals have jurisdiction also over Provident Fund matters and bonus and leave payments. Therefore, it is possible that employers' social contributions are directly affected by judicial changes. The degree of social protection can itself function as an indicator of formality, and the focus on this is thus valid for the purposes of this paper.

If the ratio of social contributions to wages is considered a proxy for the share of permanent workers, a basic underlying theoretical framework could be one, where the firm chooses the demand for different inputs (types of labour in this case) in response to changes in costs. For instance, the ratio of inputs could be expressed as a function of the price and substitutability between different inputs. Changes in worker protection and dispute settlement process can be viewed as changes in input costs. These arguments ignore that temporary and permanent workers are unlikely may not be perfect substitutes. It is important to mention that the permanent versus contract worker distinction applies only to production workers, not managerial and administrative ones.

The ASI survey design has changed a few times between in the 1980-2002 period, for which the 3-digit state-industry level data are electronically available. This concerns variables and definitions, but also the cut-off points for firm size below which only a sample is used to estimate the total number of firms and their characteristics. The national industrial classification (NIC) has also changed twice during this period. The 3-digit classification for 1970 and 1987 is more disaggregate than that for the year 1998. For these reasons, the estimation below is performed with the 1980-1997 dataset (with NIC-87).[32]

The estimated model is a state-industry (3-digit) fixed effects model of the following form

$$(3) \quad \ln(S_{ist}/W_{ist}) = \alpha_{is} + \mathbf{X}'_{ist}\boldsymbol{\beta} + \mathbf{Z}'_{st}\boldsymbol{\chi} + \mathbf{D}_t + \mathbf{S}_t + \varepsilon_{it}$$

where i refers to industry, s to state and t to time. α_{is} is a state-industry fixed effect, the dependent variable is the ratio of employer's total social contributions (S_{ist}) to the total wage bill (W_{ist}) in each state-industry, $\mathbf{X}_{ist}$ refers to a vector of state-industry characteristics, $\mathbf{Z}_{st}$ to a vector of state characteristics including the judicial indicators, $\boldsymbol{D_t}$ to a set of year dummies and $\boldsymbol{S}_t$ to a set of state specific trends. Much has been written about the determinants of total employment levels with ASI data. This paper will refrain from doing so, since this alone does not reveal much about the formal-informal divide, which can happen within the organised ASI sector and requires an analysis of entire industrial sector employment.

Table 16 shows summary statistics for the variables for the largest sample used in the regression analysis. The models control for a few state-level development indicators that might correlate with the judicial variables. For the same reason as given in Section 4.3, state development expenditure and capital expenditure are excluded, but their inclusion would not change our general conclusion on the judicial indicators. All outlier values of the dependent variable (values above 1) are removed and logarithmic form used. The regression models control for the share of production workers out of total employees.

The regression results are shown in Table 17. Different specifications with different combinations of the judicial variables are estimated. Initially, an industry level tariff indicator was included to control for trade liberalisation that may have affected hiring practices. However, since changes in such tariffs did not have a statistically significant effect, the results of model specifications with the variable are excluded, since its inclusion lowers sample size.[33] The model specifications in Table 17 include single-year (current) values of the indicators on the judicial process in practice (again logs for total disputes and court efficiency), and not the three-year means[34]. Since we have 18 years of data, this approach is more viable as it would have been in Section 4. Once again, due to the potential problems caused by a correlation between enforcement and pro-worker acts, only one of the IDA indicators is included in one model. In this case lagged values are used.[35] As in Section 4.3, different models are estimated with different sets of judicial indicators. The same sets are used here.

TABLE 16 SUMMARY STATISTICS FOR STATE-INDUSTRY ASI PANEL DATA, 1980-1997

Variable	Obs.	Mean	Std. Dev.	Min	Max
Industry					
S/W	32577	0.14	0.08	0.0003	0.99
PW/TW	32577	0.73	0.10	0.01	1.0
Total employees (TW)	32577	4387.8	13008.1	3.0	315136
Pay/worker (Rs. 000)	32577	10.71	9.03	0.05	1041.9
Value of output per worker (Rs. '000)	32577	186.4	444.4	0.26	23504.1
Effective tariff rate (%)	14884	101.5	64.7	24.6	434.4
State level					
Literacy rate	32577	55.1	14.2	30.1	90.9
Real GDP per capita (Rs. '000), 1993 prices	32577	8.7	4.3	2.15	25.6
Agriculture/GDP	32577	0.47	0.15	0.01	0.72
Services/GDP	32577	0.31	0.13	0.16	0.85
Labour regulation					
Pro-worker acts	32577	1.29	2.70	-1	11
Enforcement acts	32577	0.96	1.46	0	5
Total disputes	16631	5042.8	3389.8	0	13590
Court efficiency	15327	0.68	0.53	0	3.21
Pro-worker share	15758	0.63	0.17	0	1

The sample is the largest one used in the regressions (Table 17). S = employer's total social security payment contributions, W = total wages of all employees, PW = production workers, TW = total workers and employees. The data on tariffs is not available for all industries. Values of output and total wages are deflated by the wholesale price index for manufactured products. Literacy rate comes from the Indian Census. A few outlier values are removed for "court efficiency" as well as all outlier values above 1 for PW/TW and the dependent variable and negative values for output. Due to changes in NIC classification over the periods, a few industries have been excluded due to improper match. The states included in the final sample are Andhra Pradesh, Assam, Bihar, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, and Uttar Pradesh. Goa includes Daman and Diu up to the year 1988 onwards. Not all of these may have data on the court process indicators for each year.

TABLE 17 ORGANISED INDUSTRIAL SECTOR (ASI) EMPLOYERS' SOCIAL CONTRIBUTIONS.

DEPENDENT VARIABLE: ln (S/W)

Industry characteristics	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PW/TW	-0.588	-0.587	-0.490	-0.492	-0.492	-0.493	-0.520
	[0.078]**	[0.078]**	[0.099]**	[0.101]**	[0.101]**	[0.102]**	[0.110]**
Ln(Pay/worker)	0.005	0.005	-0.074	-0.083	-0.081	-0.083	-0.081
	[0.029]	[0.029]	[0.039]x	[0.037]*	[0.038]*	[0.037]*	[0.040]x
Ln(Total employees)	0.082	0.082	0.074	0.071	0.071	0.071	0.068
	[0.011]**	[0.011]**	[0.017]**	[0.017]**	[0.017]**	[0.017]**	[0.018]**
Ln(Value of output/worker)	0.159	0.159	0.169	0.170	0.169	0.170	0.159
	[0.016]**	[0.016]**	[0.018]**	[0.019]**	[0.019]**	[0.019]**	[0.021]**
Labour regulation							
Pro-worker act (-1)	0.007					0.020	
	[0.003]*					[0.013]	
Enforcement act (-1)		0.021			0.052		
		[0.011]x			[0.017]**		
Pro-worker share			0.040		0.037	0.040	0.043
			[0.048]		[0.042]	[0.041]	[0.042]
Ln(Court efficiency)				0.016	0.017	0.014	0.019
				[0.006]*	[0.005]**	[0.007]x	[0.007]*
Ln(Total disputes)			0.000	-0.005	-0.000	-0.001	-0.002
			[0.021]	[0.018]	[0.018]	[0.020]	[0.019]
Ln(Court efficiency) *Pro-worker act (-1)							-0.009
							[0.004]x
State characteristics							
Literacy rate	0.000	0.000	0.007	0.005	0.004	0.005	0.006
	[0.002]	[0.002]	[0.007]	[0.008]	[0.007]	[0.007]	[0.007]
Ln(Real GDP per capita)	-0.135	-0.140	-0.105	-0.097	-0.060	-0.070	-0.097
	[0.072]x	[0.073]x	[0.113]	[0.117]	[0.106]	[0.114]	[0.112]
Agriculture/GDP	0.539	0.512	0.003	-0.003	-0.155	-0.007	0.052
	[0.171]**	[0.174]**	[0.497]	[0.512]	[0.581]	[0.455]	[0.412]
Service/GDP	0.740	0.696	0.421	0.478	0.319	0.464	0.497
	[0.185]**	[0.206]**	[0.494]	[0.475]	[0.540]	[0.419]	[0.368]
Constant	-52.101	-51.317	-20.209	-19.303	-13.789	-16.442	-17.943
	[10.762]**	[10.459]**	[19.695]	[19.387]	[16.150]	[18.753]	[18.287]
Observations	32577	32577	15131	14945	14945	14945	14965
Number of state x NIC	2581	2581	2221	2192	2192	2192	2193
R^2	0.22	0.22	0.23	0.23	0.23	0.23	0.21

x, *, ** = significant at 90%, 95%, 99% level respectively. S/W = Employer's social contributions/total wages, PW = production workers, TW = total workers and employees. The standard errors (in parentheses) are corrected for clustering (state-level) and heteroskedasticity and serial correlation. All regressions include state-industry fixed effects. The regressions include year dummies and state specific trends. The panel dataset is unbalanced. 42 outlier observations with the dependent variables above 1 are excluded.

The results reveal that larger firms in terms of employment and output per worker have higher employer's social contributions in relation to the wage bill. Firms with a higher share of production workers have a lower social contribution ratio. The positive coefficients on the share of pro-worker court awards are almost, but not quite significant at the 90 percent level. Pro-worker IDA amendments have a significantly positive coefficient in one specification. One pro-worker IDA amendment is associated with a 0.7 percent higher share of social payments to wages. The exception is the weakly significant, negative coefficient on the interaction term for pro-worker amendments and court efficiency in Model 7.

Court efficiency and enforcement amendments have a significantly positive relation with social payments in several specifications. A ten percent rise in court efficiency can be linked to a 0.1-0.2 percent rise in the social payment to wage ratio. An enforcement act is associated with a 2-5 percent rise. Thus, the more efficient is the judicial process, the higher the degree of social protection offered to organised sector workers or the higher the share of permanent workers in organised industries. This would offer some support for efforts to improve the efficiency of the legal system and enforcement. However, the magnitudes of the relationships are quite small, especially for the court process indicator.

If the ratio of employers' social contributions to wages is a good proxy for the ratio of permanent as opposed to contract workers, the hypothesis that pro-worker legal change has been associated with a rise in the degree of contract workers in the organised sector is largely not confirmed. Pro-worker change may thus not act as a disincentive to recruit permanent workers as suspected. This is not entirely implausible. Whereas job security provisions can raise firing costs, the possibility of a trade-off exists if a more stable employment relationship also raises worker productivity (see e.g. Belot et al., 2007 for a theoretical analysis), which could even raise the attractiveness of hiring permanent workers.

If the focus is simply on social security as a measure of formal employment relationships, the conclusion would be that the degree of social protection offered to an average worker in an organised sector firm has risen with pro-worker legal change. Thus, pro-worker judicial change may succeed in protecting at least those workers it directly aims to protect. On the basis of the evidence showed, we cannot conclude that pro-worker IDA amendments, or improvements in court efficiency and enforcement, would have been associated with an informalisation of work within the organised, industrial sector.

5.2 LABOUR REGULATION AND SUB-CONTRACTING

This final Section examines the relationships between the judicial indicators and the tendency of small, unorganised manufacturing units to produce for contractors. This often takes place as a sub-contracting arrangement with a larger, organised sector firm or contractor (see e.g. Chandrasekhar and Ghosh, 2002). Chemin (2004) has examined this behaviour with a recent NSSO survey that includes all types of non-agricultural informal firms in relation to contract enforcement and High Court efficiency. The motivation here is different and the focus on the relation with the quality of industrial dispute settlement and pro-worker legal orientation. The hypothesis is that organised manufacturing firms might evade pro-worker judicial change or increased tendency for disputes by sub-contracting some of their production to unorganised units.

The data used come from the 56th NSSO Round survey dataset of unorganised manufacturing enterprises for the year 2000-01. It is based on stratified sampling, where the stratification is by urban-rural divide, village and enterprise type. The survey covers 152,431 unique firms, both urban and rural. These are small firms, not covered by the Annual Survey of Industries (Section 5.1) and thus by definition should have less than 20 workers (or no more than 10 if they operate with power). In the entire sample 67 percent are small, own-account enterprises without hired workers, 22 percent non-directory enterprises (up to 5 workers, at least one hired) and only 11 percent directory enterprises with 6 or more workers. Such surveys have also been carried out in the past (1989/90, 1994/95), but a further inspection revealed that comparability over time is questionable. Secondly, only the latest survey includes information on working for a contractor. In this latest survey, 27 percent of the firms responded that they work on a contract basis. The majority of such firms (73 percent) work solely for another enterprise or contractor.

The following Probit model for the probability to be engaged in contract work (destination of production is a contractor) is estimated

$$(4) \qquad P(C_i = 1 | \mathbf{X}_i, \mathbf{Z}_S, \mathbf{D}_{ind}) = \phi(\mathbf{X}_i'\boldsymbol{\beta} + \mathbf{Z}_S'\boldsymbol{\gamma} + \mathbf{D}_{ind} + \varepsilon_i)$$

where C_i is a binary variable for whether or not the firm works for a contractor, $\boldsymbol{X_i}$ represents characteristics of the firm, $\boldsymbol{Z_s}$ those of the state in which the firm operates, and $\boldsymbol{D}_{ind}$ refers to a set of industry dummies (at 3-digit National Industrial Classification NIC-98 level). The firm characteristics controlled for include gross value-added per worker, total number of workers, a dummy variable for whether the firm is registered with any authority or under a legal act

(small share) and another dummy for whether the firm replies that competition from larger units is a problem.

Since the dataset is cross-sectional, due to a high degree of correlation between certain state variables that resulted in unrealistic coefficients, not all possible state-level indicators can be included. Summary statistics for the largest sample used in the regression analysis are found in Table 18.[36] As was done with the household data, the sample is weighted by "population multipliers" (frequency weights) provided. This does not affect the main conclusions on the judicial variables.

TABLE 18 SUMMARY STATISTICS FOR UNORGANISED MANUFACTURING FIRMS, 2000/01

Variable	Obs.	Mean	Std. Dev.	Min	Max
Contract work (dummy)	89805	0.24	0.43	0	1
Competition from larger units a problem (dummy)	89805	0.14	0.35	0	1
Registered under an authority (dummy)	89805	0.24	0.43	0	1
Gross value added per worker (Rs.)	89805	22036	32606	24	2,352,030
Total workers	89805	2.8	2.6	1	20
Urban (dummy)	89805	0.62	0.49	0	1
Labour regulation					
Total disputes (3-year mean)	89805	4868	4290	138	12590
Court efficiency (3-year mean)	67340	0.69	0.51	0.24	1.96
Cases pending in state Labour Courts /population in '000	89805	0.75	0.79	0.01	2.77
Pro-worker share (3-year mean)	89805	0.53	0.15	0.25	0.71
State characteristics					
Literacy rate (%)	89805	69.5	10.3	47.5	90.9
Population per commercial banks ('000)	89805	14.2	3.6	5.0	21.0
Development exp/total expenditure	89805	0.57	0.06	0.44	0.69
Services/GDP	89805	0.53	0.07	0.41	0.86
Registered manufacturing (ASI)/GDP	89805	0.11	0.05	0.02	0.25
Real GDP per capita (Rs. 000)	89805	12.7	4.9	4.2	31.1

Weighted sample (by population multipliers rounded to the nearest whole number). The sample is the largest one used in the regressions (Table 19). There are very few missing values for the variable on competition from larger units, but given the nature of the question posed, these values can be treated as values of 0 instead of 1. The sample excludes outlier observations, where the value of total workers is above 20 (less than 1% of observations). It also excludes negative value for gross value added per worker. Smallest states and union territories are excluded. The last year for which the legal indicators were available in the statistical sources used was 1999 and thus the 3-year average is that for 1997-1999. States that include judicial data and can thus be included are Andhra Pradesh, Assam, Bihar, Chandigarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab and Tamil Nadu.

Once again, averages of the judicial variables over the past three years are used in the regressions. However, the use of a one-year lag for single year values would not have alter the results, but would have lowered the numbered of states included and thus the sample size. Since data for the number of cases pending in state Labour Courts are available for the year 2000, it is used as an alternative indicator for "court efficiency" (Model 3). The number of labour courts per state population was also experimented with, but it dropped out due to co-linearity problems.

The results shown in Table 19 suggest that unorganised firms engaged in contract work are not more productive, but according to one specification can be larger in terms of the number of workers. Contract work arrangements are more prevalent among firms not registered under any act or agency. Higher court efficiency has a significantly negative relationship with sub-contracting arrangements (Models 1 and 3), whereas the share of pro-worker awards is insignificant (Models 3 and 4). A one percent rise in court efficiency (Models 1 and 2) is associated with a 0.1 percentage point fall in the probability to work for a contractor. The magnitude does not seem very large.

The coefficient on cases pending in Labour Courts is positive and significant in Model 2, which corresponds with the result on court efficiency in Models 1 and 3. A ten percent higher degree of pending cases per population (inefficiency) is related to a 0.6 percentage point higher probability to work for a contractor. Bearing in mind the cross-sectional nature of the data, court efficiency is associated with a lower probability for a firm to engage in a sub-contracting arrangement. The sign on the coefficient for the share of pro-worker court awards is sensitive to the inclusion of the court efficiency variable, and the coefficient itself is not significant. Sub-contracting to the unorganised sector does not appear to be a significant channel for evading pro-worker judicial orientation.

TABLE 19 PROBIT MODEL: PROBABILITY OF UNORGANISED FIRMS TO ENGAGE IN CONTRACT WORK (*Marginal effects*)

Firm characteristics	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Competition from larger units a problem	-0.010 [0.016]	-0.018 [0.015]	-0.010 [0.015]	-0.015 [0.016]
Registered under an authority	-0.043 [0.019]*	-0.068 [0.018]**	-0.043 [0.018]*	-0.040 [0.018]*
Ln (Gross value added per worker)	-0.009 [0.009]	-0.003 [0.007]	-0.009 [0.009]	-0.006 [0.009]
Ln(Total workers)	0.026 [0.017]	0.036 [0.016]*	0.026 [0.016]	0.022 [0.017]
Urban	0.035 [0.032]	0.037 [0.024]	0.035 [0.032]	0.037 [0.034]
Labour regulation				
Pro-worker share (mean)			-0.026 [0.137]	0.254 [0.155]
Ln(Court efficiency) (mean)	-0.090 [0.032]**		-0.094 [0.040]*	
Ln(Cases pending/population)		0.058 [0.018]**		
Ln(Total disputes) (mean)	-0.009 [0.024]	-0.014 [0.020]	-0.012 [0.031]	0.029 [0.029]
State characteristics				
Literacy rate	-0.001 [0.002]	0.005 [0.002]**	-0.001 [0.003]	0.004 [0.003]
Population per commercial banks	0.010 [0.006]	0.017 [0.006]**	0.008 [0.013]	0.032 [0.017]x
Development expenditure/total expenditure	-0.125 [0.212]	-0.555 [0.292]x	-0.119 [0.224]	-0.291 [0.189]
Registered manufacturing/GDP	-0.240 [0.644]	-0.047 [0.576]	-0.221 [0.679]	-0.112 [0.562]
Services/GDP	0.035 [0.250]	0.096 [0.201]	0.028 [0.246]	0.250 [0.263]
Ln(GDP/capita)	0.168 [0.083]*	0.054 [0.052]	0.167 [0.083]*	0.157 [0.107]
Observations	67340	89805	69906	82917
Pseudo R-squared	0.38	0.39	0.38	0.38

x, *, ** = significant at 90%, 95% and 99% levels respectively. Models include industry dummies at 3-digit NIC-98.
Standard errors in parentheses are corrected for heteroskedasticity and clustering by state.

It needs to be acknowledged, that since the results are based on a cross-sectional dataset, they can be sensitive to specification and the coefficients may suffer from omitted variable bias. The latter is to some extent mitigated by the inclusion of a set of state-level control variables.

6 CONCLUSIONS

This study has examined the relationships between formal employment and pro-worker judicial bias and the efficiency of dispute settlement in India. Several hypotheses have been presented. Temporary workforce can provide a means to circumvent job security provisions in IDA in organised establishments. An increased reliance on contract workers could be considered as a rise in the degree of informal work within the organised sector. Judicial changes could affect the tendency of firms to shift some of their production or sub-contract work to smaller units that are not covered by various labour laws, or the dispute settlement procedures. More in general, such changes could also affect both large and small firm incentives for employment expansion.

The results show that the chosen judicial indicators matter to an extent, but significance varies. Even when statistically significant, the magnitude of the association between formal employment and the judicial indicators remains rather small. In some cases, the statutory amendments produce results that differ quite substantially from those of models that include the court process indicators. The results on IDA amendments evidently rest on the belief that the codification accurately portrays the judicial developments and bias at the state level.

The study finds little support for a negative association between pro-worker judicial change and regular versus irregular work in the entire service or industrial sector. The results on the regular versus irregular work divide are not robust to specification, or indicator, which implies that a strong relationship between judicial change and an economy-wide formal-informal employment divide cannot be confirmed. In one specification, current year pro-worker amendments to IDA have a weakly significant, negative relation with regular work in the service sector. However, the share of pro-worker court awards is insignificant for industry, and has a significantly positive relation with regular service sector work. Similarly, although there is some evidence of a negative relationship between current year IDA enforcement amendments and regular, industrial employment, such a negative relationship does not hold for the court efficiency indicator. Additionally, these results on IDA amendments are sensitive to whether current or lagged values are used.

Some of this inconclusiveness may derive from a lack of variation due to the short panel-dimension, or the possibility that regular workers are not a sufficient proxy for formal workers covered by labour laws. But, the results do also suggest that judicial change in the area of industrial disputes may not alter firm

expansion plans significantly enough to change the formal-informal worker divide. A more pessimistic conclusion would be that models that rely on such judicial indicators at a relatively aggregate level are sensitive to specification, or indicator, and unlikely to produce reliable results.

However, such a conclusion is likely to be unwarranted. Judicial change, both increased pro-worker orientation and efficiency, can be linked more consistently to the ratio of employer's social contributions to wages in the organised industrial sector. In the case of enforcement and efficiency, the practical and statutory indicators point to a similar conclusion. Higher judicial efficiency is associated with a higher degree of social payments. Pro-worker court awards are not strongly significant, but pro-worker IDA amendments have a positive relationship with the degree of social payments. Thus, the degree of social protection offered to any worker in an organised sector industrial unit has risen with judicial efficiency and pro-worker statutory change.

An intuitive explanation for the formalisation of work within the organised sector is possible. The influence of judicial change is simply clearest in the case of sectors and workers directly affected and covered by IDA and other labour laws. Although efficient courts and pro-worker judicial orientation may not affect the overall regular-irregular worker divide, such developments do protect those workers who are the primary target. If changes in the ratio of social payments to wages are interpreted as a proxy for within-industry changes in the degree of permanent workers, the results also suggest that pro-worker judicial developments, and more efficient courts, cannot be linked to within-industry increases in the shares of contract workers. It may even be possible that higher costs arising from pro-worker legal change are traded off for a rise in worker productivity, which might make the hiring of permanent workers more attractive.

Finally, the relationship between pro-worker judicial orientation and the tendency of unorganised manufacturing units to produce for contractors is also an ambiguous one. This can strengthen the conclusion that pro-worker legal evolution is unlikely to be a crucial factor behind the persistence in informal employment in India. However, more efficient courts are associated with a lower tendency of unorganised firms to engage in a sub-contracting arrangement. This relationship can appear small in size and the conclusion relies on a cross-sectional dataset, but as such it suggests that the practice of contracting out production in the hope of evading disputes and regulation could be lower when courts are more efficient. Although, efficient courts may not be linked to a lower formal-informal worker divide overall, they may still enhance

the business-environment at some level. This was one of the initial hypotheses offered for court efficiency.

The range of results on court efficiency in practice implies that efforts to improve the efficiency of dispute settlement could play a role, although a rather small one, in raising formal employment. Facilitated dispute settlement is already a feature of Special Economic Zones (SEZs).[37] At the local level, informal dispute settlement mechanisms, such as Lok Adalats (peoples' courts), have become an alternative tool for speeding up the dispute settlement process (see e.g. Sivananthiran and Ratnam, 2003).

To end with, it is important to note that personal attributes social factors, such as education, gender, religion and marital status, are found to be key correlates of employment type in a cross-sectional analysis. In terms of policy, they are likely to be more important than the legal factors. A general policy suggestion for raising the degree formal and regular work supported by the results would be to improve educational opportunities, but also to target other inequalities. A further means of formalising the informal would be to extend the scope of legislation. This is unlikely to suffice without a reformulation of law, which would need to be accompanied with a more profound change in working patterns and an expansion of opportunities for dispute settlement.

NOTES

[1] Government and public enterprises in the areas of trade and services are generally considered as organised, as are units registered under the Banking Companies Act (Bhalla, 2003). In the manufacturing sector unorganised units are categorised as own account enterprises (no hired workers), non-directory enterprises (five or fewer workers of which at least one is regularly hired) and directory enterprises (six or more workers of which at least one is hired).

[2] Prior to this the employment threshold was 300 workers. A lay-off refers to temporal unavailability of work, whereas retrenchment is permanent.

[3] Additional support for this is found for instance from Sen (2003) who claims that labour regulation has in general not been a constraint on employers, as they have circumvented many provisions due to the laxity in state administration and enforcement. She points out that in September 1998, a large textile group laid off 1200 workers in Gujarat for 34 days without asking for government permission. This was possible via an agreement with the union.

[4] A notice needs to be supplied within six weeks before a strike or a lock-out to the other party and the appropriate government should receive immediate notice, upon which it can refer the dispute for conciliation or court (Section 22).

[5] However, if the government does not respond to the application within 60 days, permission is deemed to be granted.

[6] The definition of layoff in the IDA (Section 2kkk) is given as "the failure, refusal or inability of an employer on account of shortage of coal, power or raw materials or the accumulation of stocks or natural calamity of for any other connected reason to give employment to a workman whose name is borne on the muster rolls of his industrial establishment and who has not been retrenched." Retrenchment relates to (Section 2oo) "the termination by the employer of the service of a workman for any reason whatsoever, otherwise than as a punishment inflicted by way of disciplinary action", but excludes voluntary retirement, retirement on super-annuation at age specified in the contract, on the grounds of ill-heath and since 1984 also excludes termination on the grounds of non-renewal of contract.

[7] However, court rulings have deemed various service sector activities, such as real estate and the supply of water (see Sen and Karnani Properties vs. State of West Bengal, 1990) as industrial activities. Section 2j of IDA (amended in 1982) also specifies a broad range of activities as belonging under the concept of "industry". The main exceptions are agricultural operations, hospitals and dispensaries, educational institutions, domestic services, village industries and any activity where the number employed is less than ten. In the retail industry,

state-specific Shops and Establishments Acts apply to all workmen in an establishment registered under the Act.

[8] Changes to the Contract Labour Act are of potential relevance when assessing the degree of contract work in organised firms, but there been very few state-level amendments to this act during the period examined in this study.

[9] Most disputes are settled at the state level, but the central government is the appropriate government for industries under the authority of the Central Government, railway companies and certain industries listed in Schedule 2(a) of the IDA.

[10] And in Bihar since 1956, but only for units registered under the Shops and Establishments Act (see Shenoy in Sivananthiran and Ratnam, 2003).

[11] Some suggested reasons for the delays in the abjudication process are the complex step-wise nature of the process, shortage of staff as well as qualified presiding officers, duplication of work for conciliation and abjudication, and the lack of enforcement mechanism (see Shenoy in Sivananthiran and Ratnam, 2003).

[12] I consulted the Office of the Chief Labour Commissioner in New Delhi on obtaining more detailed state-specific information on industrial disputes, court cases and outcomes over time. There appears to be no readily available central register, but information would have to be collected manually for each state separately, which would be a time-consuming task.

[13] See "Labor Regulations in India Impact and Policy Reform Options", presentation by Ahmad Ahsan to the Human Development Network, New Delhi, November 2006.

[14] Results are available on request.

[15] The data for this comes from the Annual Survey of Industries, which covers mostly manufacturing establishments.

[16] Data on state level trade union membership is not shown due to a relatively large number of missing annual observations. Available figures do demonstrate that union density varies by state.

[17] It needs to be acknowledged that job security provisions cannot simply be viewed as a cost from the firm's perspective. The firm's desire to hire temporary workers could also depend on changes in other costs and competitive pressure, and perfect substitutability between different types of workers is an unrealistic assumption. The degree to which substitutability is possible may vary by industry.

[18] The share of adults aged between 18-65 who identified "seeking work" as their principal status and who thus fit the traditional definition of unemployed has not changed much over the 16 years spanned by the four cross-sections. It

was 1.8% in 1983, 2.5% in 1987, 2% in 1993 and 1.9% in 1999. The percentage of workers with unknown industrial affiliation is small and similar in each survey.

[19] Missing data values are not a problem in this area of the survey.

[20] The sampling design differed from that of previous rounds in the sense that a set of households was revisited for employment data. For simplicity, the dataset used in this study only includes the employment data obtained during the first visit

[21] If a multinomial logit model is estimated, the majority of the explanatory variables have similar signs and significance as in the probit model.

[22] This does not alter the results dramatically, but the statistical significance of some coefficients does change.

[23] Further disaggregation of those whose education is beyond primary schooling was not appropriate, since it would have lowered the number of individuals per group considerably.

[24] Another option might have been to divide individuals by state and industry of association and carry out the analysis on a state-industry basis. However, in such a case, the group size is likely to change considerably more from year to year, since individuals change industry and workplace more frequently.

[25] Since the dependent variable now represents a share of individuals in each group, a new estimation problem is introduced. Since one of the main reasons for constructing a panel is the ability to control for some unobserved fixed characteristics for states and groups, it is important to be able to estimate a fixed effects model. Models that are developed for fractional variables such as the fractional logit model cannot easily accommodate fixed effects. The choices we are left with are a standard fixed effects model and a model where the dependent variables is the log-odds transformation, $\log[y/(1-y)]$ (see e.g. Wooldridge, 2002). The latter is an acceptable procedure, but the boundary values of 0 and 1 will be excluded. It is also difficult to estimate the marginal effects and thus the coefficients do not have a simple, direct interpretation. Thus, only standard fixed effects models are estimated.

[26] If it would be the case that wage levels affect the degree of informality, a proper measure for the wage levels between organised and unorganised workers should be included Many of the unorganised workers do not receive wages in the traditional sense and it could be preferable for this measure to be derived from an outside source rather than constructed from the household survey. Regressions with state-level minimum wage included were experimented with, but the variable was not statistically significant, and its inclusion resulted in co-linearity with several other state-level variables.

[27] See e.g. Burgess and Pande (2005) for a study on the positive effects of opening of rural banks on poverty and non-agricultural output. At first, the share of developmental expenditure in state government total expenditure and state government capital expenditure per capita were also included. However, since information was missing in the source used for two states for the earlier years of the 1980-2000 period, they were excluded to maximise the number of states with legal data. The exclusion of these two indicators does not change our conclusions about the judicial indicators.

[28] The averages are constructed so that if the information is missing for some year, only those years out of three consecutive years are considered for which data is available. This makes them approximations. Given the relatively short time dimension and the fixed effects analysis, missing values for the combined set of court process indicators pose limitations to using single, current-year observations.

[29] This coefficient would be insignificant had state-specific trends been excluded.

[30]See http://www.mospi.nic.in/mospi_asi.htm.

[31] See e.g. http://epfindia.nic.in/

[32] The results would not change much if the larger sample (1980-2002) would be used instead.

[33] The data on tariffs is imperfect and unavailable for all industries. There is no easily accessible electronic database on Indian tariffs of sufficient coverage and the data source used here did not include tariffs for all industries. Tariff data come from Das (2003) and depict the effective rate of protection, available for five-year periods between 1980-2000 at the NIC-87 3-digit level.

[34] The use of 3-year averages instead would only strengthen the conclusions on the judicial indicators.

[35] The decision to include lagged as opposed to current values of the judicial indicators and vice versa was decided simply on the basis of statistical significance. Current values were more significant than lagged for court efficiency and pro-worker share, whereas in the case of IDA amendments, the lags were more significant.

[36] Given that not all states have data on the judicial indicators, the final sample appears to be somewhat biased towards larger firms.

[37] Units inside SEZs are to be considered as public utility services. See for instance http://www.indiainbusiness.nic.in/industry-infrastructure/infrastructure/sez.htm

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ANNEX 1 All state level amendments to (deviations from) central IDA 1947 classified as "facilitation/enforcement" or "pro-worker/employer" or both.

Facilitation and Enforcement	Section		
Andhra Pradesh, 1987	2A	Individual workman can apply directly to Labour Court for abjudication of industrial dispute concerning dismissal and alike.	1
Andhra Pradesh, 1987	11	Labour Court or Tribunal has the power of a Civil Court to execute its award as a decree of a Civil Court.	1
Andhra Pradesh, 1987	29A	Maximum period of imprisonment (a penalty) for breach of settlement or award extended to a year from 6 months.	1
Andhra Pradesh, 1987	33C	Collector for recovering money due from employer (as part of award) is the Chief Judicial Magistrate or the equivalent and this money is to be considered as a fine.	1
Karnataka, 1988	10 (4A)	Workman can apply directly to the Labour Court for abjudication of industrial dispute.	1
Karnataka, 1988	11	Conciliation officer can ask for additional documents or testimonies if considered relevant for the dispute.	1
Kerala, 1979	29	Maximum period of imprisonment (a penalty) for breach of settlement or award extended to a year from 6 months.	1
Madhya Pradesh, 1981	11b	Increases power of labour courts in criminal cases.	1
Rajasthan, 1958	10A-J	State government can refer the dispute to abjudication if referred voluntarily for arbitration, and no arbitrator is appointed, or the government is of the opinion that the continuance of the dispute is not in the public interest, and the dispute would not be settled by other means. In the Central Act, no possibility of abjudication of disputes if referred for arbitration is mentioned.	1
Rajasthan, 1984	25Q	Extends penalty of imprisonment to 3 months from a month if layoff or retrenchment occurs without permission.	1
Tamil Nadu, 1949	2A	Any industry can be declared a public utility service - this can speed up the dispute settlement process since dispute will be considered from the day that the notice is received. In normal circumstances an application for conciliation/settlement is required first.	1
Tamil Nadu, 1949	10 (2A)	Employer or majority of workmen can apply directly for abjudication in a Court or Tribunal.	1
Tamil Nadu, 1982	29	Maximum period of imprisonment (a penalty) for breach of settlement or award extended to a year from 6 months.	1
Tamil Nadu, 1988	11	Conciliation officer can ask for additional documents or testimonies if considered relevant for the dispute.	1
Tamil Nadu, 1988	2[a]	Individual workman can apply directly to Labour Court for abjudication of industrial dispute concerning dismissal and alike.	1
West Bengal, 1980	11	Labour Court or Tribunal has the power of a Civil Court to execute its award as a decree of a Civil Court.	1
West Bengal, 1980	12	Amendment provides an opportunity to delay the report of the conciliation officer.	-1
West Bengal, 1980	33C	Collector for recovering money due from employer (as part of award) is the Chief Judicial Magistrate or the equivalent and money is to be considered as a fine.	1
West Bengal, 1986	15	Includes additional detail on the duties of Courts and Tribunals, specifically concerning the determination of interim relief.	1
West Bengal, 1989	10	Individual parties to the dispute can apply for abjudication if conciliation procedure is pending and no settlement is reached.	1

1 = improvement,
-1 = deterioration

Pro-worker/employer

Andhra Pradesh, 1987	2A	Individual workman can apply directly to Labour Court for abjudication of industrial dispute concerning dismissal and alike.	1
Andhra Pradesh, 1987	9A	Extends notice period for a change in service conditions of workers to 45 days (from 21 days).	1
Andhra Pradesh, 1987	25fff	Prior payment to workmen is a precondition to closure of an establishment.	1
Andhra Pradesh, 1987	25hh	When a workman is re-instated by an award, he or she is deemed to be working from the day specified in award (not when starts work as in Central Act).	1
Andhra Pradesh, 1987	33C	Collector for recovering money from employer is the Chief Judicial Magistrate and money is to be considered as a fine.	1
Gujarat, 1972	3A	In firms with more than 500 workmen, the State Government can order a Joint Management Council to be constituted.	1
Gujarat, 1972	30	Penalty for employer for not nominating representative to Joint Management Council.	1
Karnataka, 1988	10A	Workman can apply directly to the Labour Court for abjudication of industrial dispute.	1
Karnataka, 1988	11	Conciliation officer can ask for additional documents or testimonies if considered relevant for the dispute (assumed to be more costly to employee than employer)	-1
Karnataka, 1988	25K	Sections 25O and 25R of Chapter V-B (closing down of undertaking and related penalty) can be applied also to an industrial establishment of a seasonal character or where work is performed intermittently (in Central Act these Sections only apply to non-seasonal establishments), if the establishment has no less than 100 workers.	1
Maharashtra, 1982	25O	Any workman affected by the permission to close down an undertaking may within thirty days appeal against the order (not possible in central act).	1
Maharashtra, 1986	25K	Government can apply sections 25R and 25O of Chapter V-B (permission to close down an undertaking and related penalties) also to firms with 100 to 300 workers. Redundant, since central amendment in 1984 already makes the sections applicable to firms with above 100 workmen.	0
Orissa, 1983	25K	Threshold for applicability of Chapter V-B (special provisions relating to lay-off, retrenchment and closure in certain establishments) reduced from 300 to 100 workers. Transitional effect, since amendment came into force in central act in 1984.	1
Orissa, 1983	25O	The procedures of closing down an undertaking do not apply to construction work. To be ignored since covers only one sector.	0
Rajasthan, 1980	33C	Collector for recovering money from employer is the Chief Judicial Magistrate and money is to be considered as a fine.	1
Rajasthan, 1984	25K	Chapter V-B of IDA can apply to (special provisions relating to lay-off, retrenchment and closure in certain establishments) to firms with between 100 and 300 workers. Redundant since substituted by Central Act in 1984.	0
Rajasthan, 1984	25M	Permission for layoff also required for workers in mines (not in Central Act). Ignored since applies only to mines.	0
Rajasthan, 1984	25N	Government needs to hear union on permission to retrench. No mention of union hearing specified in Central Act.	1
Rajasthan, 1984	25Q	Extends penalty of imprisonment to 3 months from a month if layoff or retrenchment without permission.	1
Tamil Nadu, 1988	2A	Individual workman can apply directly to Labour Court for abjudication of an industrial dispute concerning dismissal and alike	1
Tamil Nadu, 1988	11	Conciliation officer can ask for additional documents or testimonies if considered relevant for the dispute.	-1
Uttar Pradesh, 1983	UP IDA	Threshold of workers for permission of layoff, retrenchment and closure set to 300 workers (deviates from central IDA since 1984). This is not an amendment to the central IDA, but to a state-specific act. Uttar Pradesh has its own IDA, unlike most other states. Bhattacharjea (2006) cites cases where the UP IDA has upheld over the central IDA (which was enacted in 1982, but only came to force in 1984).	-1

West Bengal, 1971	30A	Lowers penalty for closure of establishment without notice.	-1
West Bengal, 1974	2	Restricts the possibility of lay-off.	1
West Bengal, 1980	2	Ill-health qualifies as a reason for retrenchment for which permission is required. Central act does not recognise termination on the grounds of ill-health as retrenchment (for which permission can be required, depending on worker number).	1
West Bengal, 1980	25C	It is no longer possible to retrench a worker after 45 days of lay-off (in central act possible).	1
West Bengal, 1980	25E	If lay-off lasts for more than 7 days, worker only needs to present himself at work once a week to be entitled to normal compensation.	1
West Bengal, 1980	25fff	Prior payment to workmen is a precondition for closure of an establishment.	1
West Bengal, 1980	25hh	When a workman is re-instated by an award, he or she is deemed to be working from the day specified in award (not when starts work as in central act).	1
West Bengal, 1980	25K	Threshold for applicability of Chapter V-B (special provisions relating to lay-off, retrenchment and closure in certain establishments) lowered to 50 workers. Applicable for 4 years as superseded by central IDA amendment that reduced threshold from 300 to 100 workers.	1
West Bengal, 1980	25M	Extends period after which employer can lay off a worker despite government not responding to application for permission.	1
West Bengal, 1980	9A	Extends notice period for a change in service conditions of workers to 42 days (from 21).	1
West Bengal, 1986	15	Includes additional detail on the duties of Courts and Tribunals, specifically concerning the determination of interim relief.	1
West Bengal, 1989	2A	Refusal of employment by employer added to definition of an industrial dispute.	1
West Bengal, 1989	25O	Employer needs to provide details and guarantee of the payment of compensation in its application to close down.	1

1 = pro-worker,
-1 = pro-employer,
Uttar Pradesh IDA, 1983 refers to an amendment to state-specific legislation, but is considered since it is relevant in this context. Only those amendments that fit the defined categories are included. Among others, amendments dealing with qualification of judges and disqualification are not straightforward to classify and are not included. Most of the amendments are included in the Manual on Labour and Industrial Laws, Commercial Law Publishers (India) Pvt. Ltd. The following source was also used: http://pblabour.gov.in/pdf/acts_rules/inustrial_disputes_act_1947.pdf.

ANNEX 2 PANEL DATA FROM REPEATED CROSS-SECTIONS

A review of econometric methods for panels created from repeated cross-sections is provided for instance in Verbeek (2006). The modelling approach mentioned is not unproblematic. The seminal paper on the estimation of fixed effects models based on repeated cross-sections is by Deaton (1985). He proposes to group individuals (or the units observed) who share certain fixed characteristics, such as year of birth, into cohorts, and use cohort-averages as observations over time. He shows that it is possible to derive consistent estimators in a fixed effects model. With cohort averages, the estimated model will be:

$$(A1)\quad \bar{y}_{ct} = \overline{\mathbf{X}}'_{ct}\boldsymbol{\beta} + \bar{\alpha}_{ct} + \bar{u}_{ct}, \quad c = 1,..., C\ ; t = 1,..., T$$

where $\bar{y}_{ct}$ is the average value of all observations in cohort *c* in period *t*, $\overline{X}_{ct}$ a vector of cohort specific variables (averaged across cohort) and $\bar{\alpha}_{ct}$ the cohort-specific fixed effect. Besides the concerns with changes brought about by mortality and migration of individuals, which change the underlying sample, the general problem with estimating a fixed effects panel data model of the type (A1) from a series of repeated cross-sections is that the fixed effect is not constant over time. This arises because the individuals change from sample to sample and is especially of concern when the sample size per fixed effect group is small. The problem arising from the fact that $\bar{\alpha}_{ct}$ depends on time diminishes with the size of the cohort. If the cohort averages are calculated for a large number of individuals, $\bar{\alpha}_{ct}$ can be treated as a fixed parameter α_c and the within estimator for β is likely to be consistent.

If the number of individuals per cohort is not large, Deaton proposes to treat the estimation strategy as one, where the variables are measured with error. This assumes that the observed cohort averages are error-ridden estimators of the true averages, and their variance can be estimated from the underlying micro-level sample. The asymptotic assumption required is that the number of cohorts tends to infinity with more or less constant cohort size. Moffitt (1993) proposes an instrumental variable based approach and Verbeek and Nijman (1993) show that Deaton's estimator continues to be inconsistent when the time dimension is short. Many previous studies have not implemented the estimator corrections, but relied on the cohort size being large enough. This is the case for instance in Blundell, Browning and Meghir (1994) with an average cohort size of 500. However, Devereux (2004) argues that for the bias to vanish, much larger cohort sizes (2000 or more) are required.

Although, the suggested estimator corrections involve imperfections, they can be implemented for linear models. The issue becomes more complicated with binary choice models, which this paper deals with. Although, some possibilities have been suggested (see e.g. Collado, 1998), they are relatively complex, which reduces the attractiveness and possibly relative gain. Therefore, this paper relies on the relatively large number of individuals per cohort to produce reasonable estimates and the suggested corrections are not implemented.