Research Article

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Employment Protection Legislation and Labour Market Outcomes: A Unit Level Analysis of the Indian Manufacturing Sector

Abstract: Building on insights from the insider-outsider theory, we examine the effects of the Employment Protection Legislation (EPL) on labour market outcomes, using high-court verdicts on labour disputes invoking Chapter 5-A and 5-B of the Industrial Disputes Act. Our regression analysis of a statewise unit-level dataset suggests that pro-worker judicial verdicts lead to an increase in wages and labour productivity especially in labour intensive industries, but discourage employment. The study demonstrates how the insider-outsider model combined with the labour market segmentation theory, unlike labour adjustment models, explain such findings consistently. The results suggest that loosening the EPL regime will have implications on the balance between the quantity and the quality of jobs, with serious consequences on industrial performance.

Keywords: employment protection legislation, labour disputes, judicial outcomes, labour market segmentation, wages

JEL Classification Code: J21, K31

1 Introduction

The labour law debate has occupied a central place in Indian policy circles especially in the recent years (ML&E 2011; Planning Commission 2007; SNCL 2002). It has created a notion among policy makers that relaxing labour laws will put the

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industrial sector on a higher growth trajectory and generate more jobs for Indian youth. The debate has been partly informed by some international reports and research studies that highlight the strictness of India's labour law regime (Besley and Burgess 2004; OECD 2007; World Bank & IFC 2006). In the context of such discourse, a section of economists asserted that labour market regulations actually hurt workers by stifling economic growth and discouraging employment generation (Basu 1995; Besley and Burgess 2004; World Bank 2008).

Until recently, India had 35 central labour laws in place to regulate various dimensions of employment including collective bargaining, wages, layoffs, retrenchments, and working conditions. However, in 2019–20, the Central Government has clubbed the 35 central labour laws into four broader labour codes comprising of wages, industrial relations, social security, safety and working conditions. Moreover, over the past few decades, Indian states have enacted a series of amendments in their respective labour law regimes to improve the performance of the labour market (Ahsan and Pages 2009). However, such time period has witnessed a flattened wage trajectory and informalization of employment even in the formal manufacturing sector (Singh 2021; Sofi and Sharma 2015). Some economists attribute the sluggish wages and growing contractualisation to market deregulation or shifting power balance between labour and capital (Sood, Nath, and Ghosh 2014).

The debate on labour law reforms in India has produced a large body of empirical literature in the recent years (Adhvaryu, Chari, and Siddharth 2014; Ahsan and Pages 2009; Besley and Burgess 2004; Dougherty, Frisancho, and Krishna 2013; Hasan, Mehta, and Sundaram 2021; Mitra and Ural 2008; Roychowdhury 2018; Roy, Dubey, and Ramaiah 2020; Schwab 2020; Singh et al. 2019; Sofi and Kunroo 2018; Sofi and Sharma 2015a). However, previous research does not inform the discourse in a single direction due to inconsistencies in the findings.[1] The existing empirical studies usually employ the Besley and Burguess Index, which has been criticized on account of faults in coding and misinterpretation (Bhattacharjea 2006). Besides, the

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1 For example, while Hasan, Mehta, and Sundaram (2021), Schwab (2020), Adhvaryu, Chari, and Siddharth (2014), Dougherty, Frisancho, and Krishna (2013), Mitra and Ural (2008), and Besley and Burgess (2004) find negative effects of labour laws on employment, output, or productivity, the other strand of literature including Roy, Dubey, and Ramaiah (2020), Singh et al. (2019), Deakin and Sarkar (2011), and Fragenas (2010) find positive or non-negative effects of the same. Moreover, in their econometric analysis using job separation and accession rates at the aggregate manufacturing level, Sofi and Kunroo (2018) analyse the effect of EPL on labour adjustments amid demand shocks and do not report any harmful effects. A similar finding is reported by Roy (2004). The findings of Sofi and Kunroo (2018) and Roy (2004) raises a question mark on previous reports of negative productivity effects of EPL, as they cannot be explained as long as labour adjustments are not hampered.

Besley and Burgess Index only accounts for amendments in the labour law over time, while ignoring their enforcement. Furthermore, the previous literature from India has developed a very little understanding about the effect of EPL on wages particularly in segmented labour markets where the employer-employee relationship of one sub-market is operating under one set of rules or practices (structures), while that of the other sub-market is governed by another (Doeringer and Piore 1971; Hudson 2006). A simple example of labour market segmentation is the dualistic market, which can take several forms including the market for contract and permanent workers (Pietro and Filippo 2013) – another example could be the gender-based segmentation (Chauvin 2018). The dualism in terms of the contract and permanent binary has sparked a debate in recent years, especially in Indian context.

This study investigates the effect of EPL on labour market outcomes including wages, employment, and labour productivity within the dualistic labour market segmentation context. India has a federal governance structure, and each of India's 28 states has a High Court (with constituent other courts). We use state-wise high court verdicts on labour disputes over the period 2007–2013 to create an EPL indicator, thereby capturing the actual implementation of the legislation across various Indian states. The court judgment analysis is restricted to verdicts invoking Sections 25-B, 25-F, 25-C, 25-FF, and 25-FFF of Chapter 5-A and Sections 25-M, and 25-N, and 25-O of Chapter 5-B of the Industrial Disputes Act (IDA), 1947 as they account for most of the EPL regime in India since it relates to the formal organized industrial sector. We use unit-level Annual Survey of Industries (ASI) for the period 2013–14 covering 57,968 enterprises, which is the most extensive database for the industrial sector in India.

The study also attempts to contribute to the theoretical underpinning of EPL and its impact on labour market outcomes. We extend the insider-outsider model (Lindbeck and Snower 1987) to a dual labour market context facing the co-existence of the formal and informal employment system, which is more applicable to developing countries like India. Our model demonstrates how labour turnover costs created by EPL can drive up wages of privileged incumbents even in a dualistic labour market, though the positive wage effect may reduce labour demand in the market. We argue that the insider-outsider model and labour segmentation theory explain the effect of EPL on labour market outcomes more consistently compared to other models that focus on employment adjustments. The conceptual underpinning of EPL and labour market outcomes in a segmented labour market can add extra dimensions to the existing debate on labour law reforms in India and elsewhere. Further, it will help government policy makers to rightly predict the potential impact of labour reforms on labour and industry, thereby informing the policy-making.

2 Theoretical Framework

The academic debate on labour law particularly in the Indian context draws on mathematical models underpinning the effect of hiring and firing costs on industrial performance, including Hopenhayn and Rogerson (1993), Bertola (1990), Garibaldi (1998), and Nickell (1986) among others. This strand of economic literature attempts to pin down the effect of firing costs on labour adjustments to predict the levels of employment and productivity under varying regimes of EPL. They argue that a rise in firing costs hamper optimal employment responses to market shocks and cause inefficiencies, thereby affecting hiring decisions of business enterprises during economic upturns.

One of the main limitations of such models is that they are unable to explain the effect of firing costs or EPL in dualistic labour markets facing the co-existence of short-term contract and permanent workers. In countries like India, contract workers often fall outside the purview of EPL and can be terminated from their services easily without seeking permission from the government (Sofi and Sharma 2015a). The aforementioned theories do not incorporate such realities in their analysis, and hence they are less applicable in the segmented labour markets. Moreover, a microeconomic empirical investigation of such models require data on job destruction and job creation, which usually remains missing in plant level datasets in countries like India.

Therefore, extending the insights from the insider-outsider theory (Lindbeck and Snower 1987) to segmented labour markets, we underpin the role of EPL in wage determination, which further enables us to predict employment and productivity effects of labour law without having to invoke the rigidity of labour law line of thought.

Labour market segmentation could take several forms, but we are particularly interested in the dualistic segmentation in terms of formal (permanent) and informal (contractual) employment. The dualistic segmentation can generate differential labour market outcomes such as wage differentials and unequal access to skill training (Deakin 2013; Jun 2019). There are contrasting viewpoints about the factors inducing such dualism. Neoclassical theory traces the sources of the segmentation on the supply side, linking it to investment in human capital and differences in individual characteristics such as experience and abilities. The neoclassical theory emphasizes on skill development and active labour market policies to achieve labour mobility from secondary segments (low paying markets) to primary segments (high paying markets). In contrast, the labour market segmentation theory attributes the phenomenon to the demand side (Leontaridi 1998). It invokes institutional or structural factors and employer practices to explain the

issue of wage differentials between workers (with similar skills or job roles) and the lack of mobility from secondary to primary segments. With such a backdrop, the analysis of dualism in India's organised labour market is of particular importance as the existing labour law regime is dualistic in itself. The Industrial Disputes Act (IDA), 1947, which is central to the EPL regime, provides for employment of contract workers who are excluded from most of the hiring and firing laws. The share of contract workers (usually considered as cheap labour) has increased from 13% in 1993–94 to 35% in 2012–13 (Sofi and Sharma 2015b) and their services are used even in core business activities (NCEUS 2009).

To explore the link between EPL and wages amid such type of labour segmentation, we begin with the assumption that the production function facing the employer is given as $Q = f(\overline{K}, L)$ where Q is output, L is labour, and $\overline{K}$ is capital, which is constant. The primary objective of the employer is to maximize profit (π), which is total revenue minus total cost (C). The total revenue (V) is equal to the total output (Q) multiplied by the product price (Px), and the latter is assumed to be fixed (i.e. $V = Px.Q$). Since K is fixed in the short-run, the revenue function can be written as $V = Px.f(L)$. The total cost (C) consists of total wage bill ($W.L$) and total rental cost ($r.K$), where W and r are the prices of labor and capital services, respectively while L and K are the number of workers and capital units respectively (i.e. $C = W.L + rK$). Thus, the profit maximizing employer maximizes $\pi = Px.Q - W.L + rK$. Differentiating the profit function with respect to L and setting the first derivative equal to zero, the profits are maximized when $Px.(dQ)/dL = w$ (where dQ/dL is the Marginal Productivity of Labour or MPL). As Px.MPL is the Value of Marginal Productivity of Labour (i.e. VMP_L), employer can profitably employ additional units of L as long as VMP_L is greater than W.

Now consider a dual labour market offering two types of labour inputs: regular labour and contractual or informal labour, with outsiders as unemployed category, which are unable to find a job at the prevailing wage rate. The recent empirical research shows that the non-regular labour is less productive than the regular labour (Lisi and Malo 2017; Maiti 2013; Sofi and Sharma 2015b). Such productivity differential could be the outcome of the segmentation as noted in the detailed discussion latter in the results section. Incorporating the potential productivity differential in our analysis, let $Q_1 = f(L_R)$ be the production function of regular labour and $Q_2 = f(L_C)$ be that of the informal contractual labour. The two production functions are shown graphically in Figure 1a given below. Based on those production functions, we can derive separate VMP curves for the regular labour, henceforth VMP (RL), and contractual labour, henceforth VMP (CL) as given in Figure 1b. The VMP curves, acting as demand curves for the employer, are based on the assumption that only one product is produced and its market price is constant.

Figure 1: EPL and labour market outcomes in a dualistic labour market.
The model is developed by the authors of this paper.

From the VMP curves, we can derive marginal profit curves presented in Figure 1c. When the wage rate is equal to VMP, the marginal profit becomes zero and the profit curve touches X-axis.

Initially, the firm maximizes its profit at point $E1$ where the reservation wage (W^*) intersects the VMP(RL) curve, while the marginal profit curve $M\pi 1$ [based on regular labour (R) and wage (W^*)] touches X-axis. Note that the reservation wage is the least wage at which the worker is willing to work. At point $E1$, the firm employs ON number of regular workers at OW* wage rate, and makes profit OMN. For instance, assuming that the employee turnover cost to the employer is zero and that the unemployment rate is significant, if an incumbent worker tries to bid up

his/her wage rate, the employer can replace him/her with an outsider (unemployed labourer). Thus, in the absence of EPL, which creates labour turnover costs to the employer for firing a worker (Garibaldi and Violante 2005), real wages of workers are expected to be minimum.

If there is EPL in place and workers bargain for higher wages, the employer has two options: either to increase the wage rate of incumbent regular workers or fire them. If the firm chooses the second option, it has to bear the labour turnover cost arising due to EPL. A profit-maximizing employer would choose the first option as long as the additional wage demanded by incumbent workers is lesser than the labour turnover cost for replacing them. Similarly, a rational worker can successfully bargain for higher wages till the additional wage demanded is lower than the employee turnover costs to the employer in case of the termination of employment contract.

Thus, theoretically, EPL has the potential to drive up wages of privileged (regular) incumbents, even if the unemployment rate among outsiders is high. Likewise, a reduction in the strictness of EPL is likely to cause a reduction in real wages through a similar mechanism. The implementation of EPL causes an upward shift in the wage rate from $W^\star$ to W in Figure 1. Consequently, the marginal profit curve shifts downwards to $M\pi2$. The new equilibrium takes place at point $E2$ where the new wage curve W intersects the VMP (RL) curve. At this new equilibrium, the firm employs OU *regular* workers and makes OKU profits.

If the labour law regime is dualistic, firms can counter the bargaining power of incumbent regular workers by hiring contract workers, which fall outside the purview of EPL (Sofi and Sharma 2015a). Since employee turnover costs to the employer for firing a *contract* labour is assumed to be zero, bargaining power relation tilts towards employers, enabling them to press down real wages of workers. Thus, even if there is an EPL in place, the real wages of contract workers could settle down at the reservation wage ($W^\star$). However, the substitutability between regular and contract workers could be restricted by the productivity differential that might exist between the two types of workers under the given market structure. Therefore, while the use of the non-regular workforce may be gainful for the firm on wage front, it can lead to a loss on the productivity front (Maiti 2013; Sofi and Sharma 2015b). The employer's choice to hire permanent or contract labour depends upon the relative strength of the productivity differential and the wage discrimination against non-permanent workers. As long as the wage differential against contract workers outweighs the productivity differential, the employer would have an incentive to replace regular workers with contractual workers. This can be formally written as follows:

$$\frac{\partial\,(\text{VMP})}{\partial\,(RL)} - \frac{\partial\,(\text{VMP})}{\partial\,(CL)} < W_{RL} - W_{CL}$$

where VMP is the Value of Marginal Productivity, and RL and CL are regular labour and contractual labour, respectively. Profits are maximized where

$$\frac{\partial\,(\mathrm{VMP})}{\partial\,(RL)} - \frac{\partial\,(\mathrm{VMP})}{\partial\,(CL)} = \mathrm{W}_{RL} - \mathrm{W}_{CL}$$

Thus, under a dual labour market, the bargaining power of incumbent regular workers depends on (a) the gap in the marginal productivity of regular and contract workers and (b) the labour turnover costs created by EPL. Further, as long as contract workers are excluded from the ambit of EPL, their ability to bargain for higher wages is likely to be lesser.

Suppose the productivity differential between contract and regular workers is given by the gap between VMP (RL) and VMP (C)1 or PD1, which is apparently lower as compared to the wage differential (WD or $W - W^\star$). In such situation, the equilibrium takes places at $E3$ where VMP(C)1 intersects the reservation wage ($W^\star$), while the marginal profit becomes zero at V where the marginal profit curve ($M\pi^\star$) and x-axis touch each other. At point $E3$, the employer hires OV labour (higher as compared to that at $E2$) and makes OSV profit. Thus, if the wage differential against contract labour outweighs its productivity differential, profitability increases, leading to a higher employment level. However, if the magnitude of the productivity differential (in monetary terms) comes closer to the wage differential against the contract labour, then the use of the latter would not bring additional benefits to the employer. In fact, from a profitability point of view, the employer would be indifferent between regular and non-regular workers. However, we demonstrate below that if the employer still chooses to hire contractual workers, the working class would become worse off because they would be hired at the minimum wage even though the profitability and employment level remains the same. Thus, under a severe Productivity differential, the employment of non-regular workers would be Pareto inefficient. This is demonstrated in Figure 1.

Let's consider a higher level productivity differential represented by PD2 or the larger gap between VMP (R) and VMP (CL)2. Since, the magnitude of the PD2 is more or less equal to the wage differential (WD), the marginal profit curve will again shift downwards to ($M\pi2$). The new equilibrium takes place at $E4$ at which VMP (CL)2 intersects the reservation wage curve ($W^\star$), while the marginal profit curve ($M\pi2$) touches the x-axis at U. At the new equilibrium point $E4$, the levels of employment and profit are the same as were obtained at $E2$ corresponding to the higher wage rate (W) under EPL using regular workers. It is interesting to note that if the firm chooses the equilibrium point $E2$ (using OU regular workers at OW wage rate) over $E4$ (using OU contract workers at the reservation wage rate), workers would be better off with higher wages without any loss in employment or profit.

From this discussion, it follows that EPL informs the wage-bargaining position of labour, translating into higher wages for permanent workers. The negative employment effects of the EPL can be explained by the wage effect, even under positive productivity effects of the legislation.

3 Methods and Data

We utilize the plant level Annual Survey of Industries (ASI) database for the year 2013–14 collected by the Ministry of Statistics and Programme Implementation, Central Statistical Organization, Government of India. Our study selects 15 major states of India including Andhra Pradesh, Rajasthan, Karnataka, Uttar Pradesh, Tamil Nadu, Assam, Bihar, Orissa, West Bengal, Maharashtra, Kerala, Gujarat, Punjab, Haryana, and Madhya Pradesh. The ASI 2013–14 surveys 57,968 firms across all Indian states. However, out of the 57,968 firms, there are 21,876 in these 15 states in this study, excluding non-open firms, which are not considered in this analysis. We are interested in those open firms that report data on wages, output, net value added, fixed capital, materials consumed, fuels consumed, number of workers, profits, contract workers, and regular workers. Majority of the open firms (more than 90%) from the selected states report data on NVA, materials consumed, fuels consumed, fixed capital, number of workers, directly employed workers, wages to directly employed workers, and profits. However, the data on contract workers and their wages are reported by only 33% of them.

To capture the actual implementation of EPL, we analyse court verdicts on labour disputes over the period 2007–2013 across 15 states of India, and on that basis, examine their effect on a firm's employment policy in 2013–14. The justification for the collection of judicial data for the said period (2007–2013) follows from the trade-off between the total number of court verdicts and the relevance of cases from the distant past in a firm's employment policy in 2013–14 – remember this is the period of our economic analysis. If we retrieve the court verdicts from the distant past, the aggregate number of cases for our analysis increases but their relevance for a firm's labour policy in 2013–14 decreases. Similarly, the relevance of the cases from the recent past (say 2–3 years back) remains high for firm's employment policy in 2013–14, but then the number of cases for our analysis decreases, which can affect the credibility of the estimates. Therefore, considering the existence of such trade-off, we restricted the data collection of court judgments to the period between 2007 and 2013 only. Our focus remains particularly on those high-court verdicts citing Chapter 5-A and 5-B of the IDA, 1947. We are interested only in (Sections 25-B, 25-F, 25-C, 25-FF, and 25-FFF of) Chapter 5-A and Chapter 5-B (its Sections 25-M, 25-N, and 25-O). Chapter 5-B is applicable to business enterprises

operating with at least 100 workers. Both these Chapters exclude industrial establishments performing seasonal or intermittent business activities only, and they are not applicable to casual or contract workers.

Using online databases of Legitquest.com and Legalcrystal.com, we were able to retrieve 327 detailed court verdicts during the period 2007–2013. The judicial outcome of the court verdicts (327) have been classified into pro-worker (176), pro-employer (136), and neutral categories (5), with state-wise details of the same being provided in Table 1 below. As reported, Maharashtra tops the list with 56 total number of court verdicts followed by Haryana (45) (which are among the most industrialized states of India), while West Bengal with just three verdicts has the lowest. The net pro-worker verdicts (pro-worker minus pro-employer) is highest in Haryana (19) followed by Tamil Nadu (10), Punjab (5), and Gujarat (5), while it is lowest in Andhra Pradesh (–4) and Uttar Pradesh (–4). The overall judicial outcome of the labour disputes shown in the last column (Table 1) is *pro-worker in 10 states and pro-employer in five states*. Note that we denote the overall judicial outcome as pro-worker if the number of pro-worker verdicts is greater than the number of pro-employer verdicts. The overall judicial outcome is used in our econometric analysis by assigning dummy 1 and 0 to pro-worker and pro-employer states respectively.

To estimate the effect of EPL on wages, we use the following model specification.

$$y_{is} = \beta_0 + \beta_1 EPL_s + X'_k\beta_k + \epsilon_{is}$$

In this equation, y_{is} is the logarithms of the outcome variables (in ith firm and sth state) including wages per worker, number of workers (employment), NVA per worker (labour productivity), which are estimated separately in three sets of regressions. The EPL is the dummy variable, which is defined as 1 for the pro-worker states and 0 for the pro-employer states. The coefficient on EPL (β_1) captures the differential intercept for pro-worker states in comparison to pro-employer states. The third term ($X'_k\beta_k$) represents the vector of control variables, and ϵ_{is} is the model error term. We include different vectors of control variables for estimation of each of the outcome variables. In wage regression, we control for NVA, fixed capital per worker, profit margin ratio (profits/GVA*100), fuels consumed, and materials consumed. In employment regression, we control for wages per worker, NVA, and fuels consumed. Finally, in the labour productivity regression, we control for share of contract labour in total workforce (contractualisation), capital per worker, and fuels consumed. The justification of the control variables is discussed in the results section.

The distribution of logarithms of total workers is presented in the box plot given in Figure 2. The line in the box is the median and the two sub boxes represent

Table 1: Judicial outcomes of labour disputes over the period 2007–2013, citing Chapter 5-A and 5-B of the IDA, 1957.

S. no.	State	Number of court judgments	Pro-worker	Pro-employer	Neutral	NET (pro-worker minus pro-employer)	Judicial outcome
1	AP	12	4	8	0	–4	Pro-employer
2	WB	3	2	1	0	1	Pro-worker
3	Gujarat	28	16	11	1	5	Pro-worker
4	Maharashtra	58	29	28	1	1	Pro-worker
5	Rajasthan	16	9	7	0	2	Pro-worker
6	Madhya Pradesh	17	9	7	1	2	Pro-worker
7	Tamil Nadu	34	22	12	0	10	Pro-worker
8	Karnataka	30	9	11	0	–2	Pro-employer
9	Uttar Pradesh	6	1	5	0	–4	Pro-employer
10	Orissa	17	11	6	0	5	Pro-worker
11	Punjab	37	21	16	0	5	Pro-worker
12	Haryana	45	32	13	0	19	Pro-worker
13	Assam	7	3	4	0	–1	Pro-employer
14	Bihar	7	2	4	1	–2	Pro-employer
15	Kerala	10	6	3	1	3	Pro-worker
Total		**327**	**176**	**136**	**5**	**35**	

Authors' calculation based on study of court verdicts retrieved from Legitquest.com and Legalcrystal.com.

the observations in the second and third quartile, while outside the box is the first quartile on the left and fourth quartile on the right – the dots on the right are the positive outliers. The total number of workers across the firms, falling within the second and third quartile, are less scattered as compared to the first and the fourth quartile. Similarly, in Figure 3 plotting logarithms of wages in the box plot, the distribution mimics a normal distribution, as the width of the first and fourth
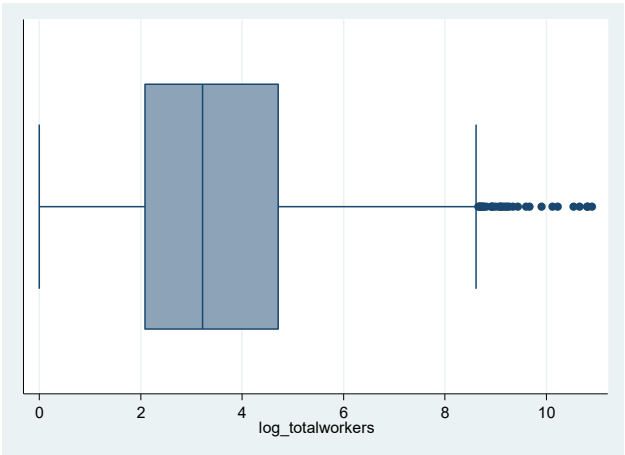

Figure 2: Distribution of logarithms of total number of workers, using box plot.
Data source: ASI (2013–14).
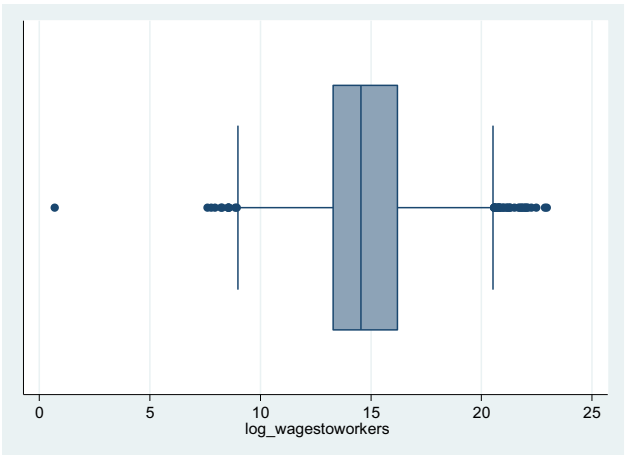
Figure 3: Distribution of logarithms of wages, using box plot.
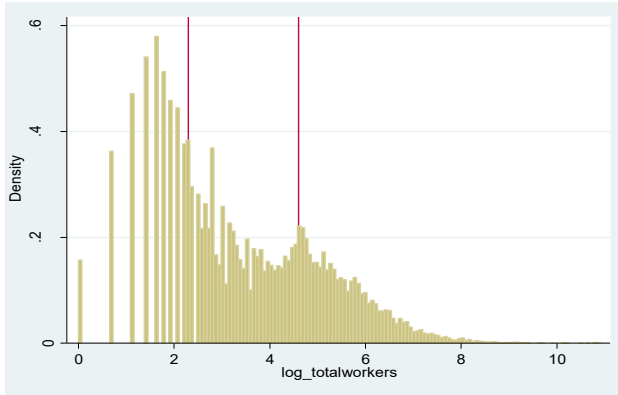Data source: ASI (2013–14).

Figure 4: Distribution of logarithms of total number of workers, using histogram.
Data source: ASI (2013–14).

quartile is nearly same, while the values in the second and third quartile are tightly distribution around the mean. The distribution of number of workers can be alternatively analysed using a histogram in Figure 4. In the Figure, the space between y-axis to first red vertical line (from left) represents the density of the observations in 0–10 interval (number of workers in absolute terms); similarly, fist red vertical line to second red vertical line shows the density of the observations in 10–100 interval. The distribution of the observations in the first zone (below the minimum threshold of 10 workers) appears to be systematically higher, while there is a marked concentration around the second red vertical line (from left). Such patterns could be linked to the applicability of the Chapter 5-A and 5-B of IDA, 1947.

4 Empirical Results and Discussion

We first estimate the effect of EPL on wages using three regressions in logarithmic forms. The results of the first regression, which is estimated without control variables, are presented in second column of Table 2. The coefficient on EPL is 0.143 and it is significant at 1% level of significance. The positive and significant coefficient on EPL (with 21,746 observations) shows that wages per worker are higher in pro-worker states by 14%. To make sure that such a finding is not generated by an omitted variable bias, we control for capital per worker, net value added (NVA), profit margin ratio, materials consumed, and fuels consumed in a second regression. After including these five control variables in the regression, the coefficient

Table 2: The effect of EPL on wages.

Dependent variable = log of wages per worker	First regression (without control variables)	Second regression-2 (including control variables)	Third regression (including firm size and control variables)	Fourth regression (including dummy for labour intensive firms)
EPL – dummy for pro-worker states	0.143*** (0.008)	0.086*** (0.007)	0.09*** (0.007)	0.018* (0.01)
Firms with 100 or more workers – dummy	—	—	−0.35*** (0.01)	—
Labour intensive firms – dummy	—	—	—	−0.248*** (0.01)
EPL*labour intensive	—	—	—	0.14*** (0.01)
Log capital per worker	—	0.05*** (0.001)	—	—
Log net value added	—	0.150*** (0.003)	0.18*** (0.003)	0.135*** (0.003)
Log profit margin	—	−0.026*** (0.002)	−0.03*** (0.003)	−0.02*** (0.003)
Log materials consumed	—	−0.009*** (0.001)	0.002 (0.001)	0.003** (0.001)
Log fuels consumed	—	−0.027*** (0.002)	−0.004* (0.002)	−0.02*** (0.002)
Constant	11.22*** (0.006)	8.69*** (0.03)	8.42*** (0.03)	9.49*** (0.03)
Number of observations	21,746	15,117	15,117	15,117
Adjusted R-square	0.013	0.33	0.34	0.31

(a) Figures in parentheses represent standard errors and (b) *= 0.05 < p < 0.10. **= 0.01 < p < 0.05 and ***= p < 0.01.

on EPL falls from 0.14 to 0.08, but it is still significant at 1% level of significance. The coefficient on capital per worker (0.05) is significant, indicating that firms with higher capital per worker offer higher wages. This finding makes theoretical sense as higher capital per worker raises labour productivity (Sofi and Sharma 2015b), translating into higher wages.

The coefficient on NVA, which captures the demand side of the product market, is 0.15 and significant at 1% level of significance indicating that wages are also linked to the product's market conditions. On the other hand, the coefficients on profit margin ratio (–0.026), fuels consumed (–0.027), and materials consumed (–0.009) are all negative and significant at 1%. The negative associations of these controls are theoretically consistent as increase in the consumption of inputs increases the cost of production, forcing firms to reduce wages – and it is thus needless to justify the negative association between wages and profits. The number of observations in the second regression decreases to 15,117 due to missing data for some of the variables. In the third regression, we include a dummy 1 for firms with 100 or more workers and zero for firms with less than 100 workers to check the effect of the size of workforce on wages. The coefficient on the dummy is –0.35 and significant at 1% level of significance, indicating that increase in the size of workforce results into lower wages.

Finally, in the fourth regression, we include a dummy for labour intensive enterprises to check for wage differentials. A firm is considered as labour intensive if its log of capital to labour ratio is below the 50th percentile, and zero if otherwise. Further, to estimate the level of wages in labour intensive enterprises operating under pro-worker regimes, we introduce an interaction between EPL and the labour intensive dummy. In this regression, we exclude the log of fixed capital per worker as it is highly correlated with the labour intensive dummy. We find a negative coefficient on the dummy for labour intensive enterprises (–0.24), significant at 1% level of significance, indicating that wages are lower in labour intensive enterprises as was expected because of the low productivity growth of such enterprises owing to the limited use of the advanced technology (Manjappa and Mahesha 2008). Interestingly, the coefficient on the interaction between EPL and labour intensity is positive (0.14) and significant at 1%, suggesting that wages in the labour intensive enterprises operating under pro-worker EPL regimes are higher than other labour intensive enterprises. These findings are justifiable within the theoretical framework presented in this study.

Next, we estimate the effect of a rise in the share of contract labour in total number of workers on wages per worker (henceforth constractualisation).[1,2] Two

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2 It was possible for us to estimate such effect by adding the contractualisation variable in the precious regressions. However, that would lead to a loss of a large number of observations as majority of the firms (about 66%) do not report data on contract workers. It may be noted that the effect of EPL on wages per worker does not change when we control for contractualisation.

Table 3: The effect of contractualisation on wages.

Dependent variable = log of wages per worker	First regression (without control variables)	Second regression (including control variables)
Log share of contract labour in total workforce	−0.213*** (0.009)	−0.07*** (0.008)
Controls	—	Log of capital per worker, profit margin, NVA, materials consumed and fuels consumed
Constant	12.2*** (0.03)	8.55*** (0.06)
Number of observations	7242	4932
R-square	0.06	0.45

(a) Figures in parentheses represent standard errors and (b) *= 0.05 < p < 0.10. **= 0.01 < p < 0.05 and ***= p < 0.01.

regressions are run for this purpose in logarithmic forms: first regression without control variables and the second with control variables. Presented in Table 3, the coefficient on the log share of contract labour in total workforce (−0.213) is negative and significant at 1%, indicating that wages per worker fall with a rise in contractualisation. After controlling for capital per worker, profit margin ratio, NVA, materials consumed, and fuels consumed, the coefficient on contractualisation (−0.07) falls but still remains significant at 1%. The negative effect of contractualisation on wages is explained by the dualistic segmentation of the labour market embedded in the labour law regime itself and exploited by employers. The empirical finding validates one of our model predictions.

Further, we estimate the effect of EPL and contractualisation on labour productivity as it is of particular importance in the debate. The labour productivity (dependent variable) is measured as NVA per worker, and it is estimated in three separate logarithmic regressions as shown in Table 4. In the first regression without control variables, we estimate the effect of contractualisation on labour productivity. The coefficient on the log share of contract labour in total workforce is −0.26 and significant at 1%, suggesting a fall in productivity as contract labour share increases. It also confirms the productivity differential assumption (between regular and contract workers) used in our theoretical model. The value of the coefficient falls to −0.06 after including control variables in the second regression, but it is significant at 1% level of significance. The productivity differential between contract and permanent workers can be explained as an outcome of the labour market segmentation, at least partly, through multiple channels. First, contract workers would be reluctant in firms' innovative activities as the latter might not benefit them given the nature of their employment (Kleinknecht 1998; Lisi and Malo 2017). Similarly, contract workers would have lesser motivation to invest in

Table 4: The effect of EPL and contractualisation on labour productivity.

Dependent variable = log net value added per worker	Regression 1 (including contract share without control variables)	Regression 2 (including EPL and control variable)	Regress 3 (including labour intensity and interaction effect)
Log share of contract labour in total workers	−0.26*** (0.02)	−0.11*** (0.117)	−0.142*** (0.018)
EPL	—	0.22*** (0.02)	0.007 (0.04)
Labour intensive – dummy	—	—	−1.52*** (0.04)
EPL*labour intensive	–	—	0.39*** (0.05)
Log fixed capital per worker	—	0.27*** (0.005)	—
Constant	17.7*** (0.085)	9.57*** (0.10)	9.57*** (0.10)
Number of observations	6647	6647	6647
Adjusted R-square	0.02	0.32	0.32

(a) Figures in parentheses represent standard errors and (b) *= $0.05 < p < 0.10$. **= $0.01 < p < 0.05$ and ***= $p < 0.01$.

acquiring firm specific skills if there is no long-run commitment with the firm (MacLeod and Navakachara 2007), or their access to the on-campus training is limited if the employment contracts are for fixed time periods only (Albert, Garcia-Serrano, and Hernanz 2010; Booth, Francesconi, and Frank 2002).

We include EPL in the regression and control for fixed capital per worker. We find that the coefficient on EPL is positive (0.22) and significant, suggesting that labour productivity in enterprises operating under strict EPL regime is higher as compared to flexible regimes. The positive differential effect of EPL on labour productivity can be attributed to incentives for firms or employees under pro-worker EPL regimes to invest in firm-specific training (Belot, Boone, and Ours 2007) and innovations (Acharya, Baghai, and Subramanian 2014; Griffith and Macartney 2014; Koeniger 2005). In the third regression, we estimate differential effects in labour intensive enterprises along with an interaction effect. The coefficient on the dummy for labour intensive firms is −1.52 (significant at 1%), indicating that the labour productivity is lesser in labour intensive industries. This finding is well in line with the previous research (Manjappa and Mahesha 2008). The coefficient on the interaction effect between EPL and labour intensity is positive (0.39) and significant at 1%, thus yet again indicating that the positive effect of the pro-worker legislation is more pronounced in labour intensive enterprises.

Finally, we estimate the effect of EPL on employment using logarithms of number of workers as the dependent variable, while controlling for net value added, wages per worker, and fuels consumed. In the first regression (Table 5), we check the nature of the association between log number of workers and the control variables, excluding EPL. We find a positive coefficients on NVA (0.665) and

Table 5: The effect of EPL on employment.

Dependent variable = log number of workers	Regression 1 (without EPL)	Regression 2 (including EPL)
EPL (or pro-worker states) – dummy	—	−0.09*** (0.012)
Log NVA	0.665*** (0.004)	0.66*** (0.004)
Log wages per worker	−0.67*** (0.012)	−0.66*** (0.012)
Log fuels consumed	0.111*** (0.004)	0.11*** (0.004)
Constant	−1.29*** (0.121)	−1.34*** (0.12)
Number of observations	20,262	20,262
Adjusted R-square	0.75	0.75

(a) Figures in parentheses represent standard errors and (b) *= $0.05 < p < 0.10$. **= $0.01 < p < 0.05$ and ***= $p < 0.01$.

materials consumed (0.11) with both of them significant at 1%, which is theoretically consistent. The coefficient on wages per worker is negative (−0.67) and significant, which is of particular relevance in the context of our model as we seek to explain the employment effects of EPL through wages only. The coefficient on EPL dummy, included in the second regression, is negative (−0.09) and significant at 1% level of significance, suggesting that firms operating under pro-worker EPL employ lesser workers as compared to pro-employer states. This finding is perfectly in line with our model predictions and can be explained by the negative association between wages and employment. In other words, EPL strengthens the wages-bargaining power of workers and thereby drives wages upward, which in turn reduces employment.

5 Conclusion

The fundamental aim of this study was to investigate the effect of EPL in a segmented labour market context particularly dealing with labour dualism in terms of contract and permanent workers. Using a unit-level Annual Survey of Industries (ASI) and the judicial outcomes of labour disputes, we find a positive effect of EPL on wages particularly in labour intensive enterprises but a negative effect on employment. Using insights from the insider-outsider model, we explain how the positive wage effects are driven by firing costs created by EPL and how they (positive wage effects) translate into negative employment effects. Additionally, our results show a negative effect of contractualisation on wages and labour productivity, while the latter is found to be positively associated to EPL especially in labour intensive enterprises.

We argue that the negative effect of contractualisation on labour productivity is attributable to short-run commitments between firms and workers, dissuading them from investing in firm-specific human capital. Under a pro-worker EPL regime, workers have incentives to upgrade their skills while employers find on-the-job training programmes profitable, thereby ensuring higher productivity. Thus, the insider-outsider model combined with the labour market segmentation theory consistently explains positive wage and productivity effects and the negative employment effect of EPL. The "rigidity argument" advanced in the previous literature does not explain these findings consistently.

Based on our findings, we can conclude that any attempts that aim to widen the scope of labour dualism in India's existing labour law regime may exacerbate the labour market outcomes and thereby affect industrial growth and earning capacity of workers. Until 2018, employers in India were required to hire contract workers through contractors. In 2018, the Central government amended the Industrial Employment (Standing Orders) Central (Amendment) Rules to enable employers to hire contract workers directly through fixed term employment contracts. The same provision has been incorporated in the Industrial Relations Code, 2020. Unlike workers hired through contractors, workers employed through fixed term contracts would be eligible (during the service period) for most of the employment benefits applicable to their permanent counterparts, including equal wages, allowances, and working conditions. While the fixed term employment system may, in principle, address the issue of wage discrimination against non-permanent workers, it is unlikely to curb the ill effects of the segmentation unless firms offer long-term employment contracts. Short-term contracts will discourage on-the-job skill training and perpetuate the productivity differentials between permanent and the contract workers, thereby undermining the sustainability of such an employment system.

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