

Economic Shocks and Labour
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Protection Legislation Create
Rigidity in the Dualistic Labour
Market

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Employment and Social Protection for Inclusive Growth

Economic Shocks and Labour Adjustment: Does Employment Protection Legislation Create Rigidity in the Dualistic Labour Market?

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Abstract: Theoretical literature in labour economics argues that employment protection legislation (EPL) has the potential to create rigidity in labour adjustment and, thereby, lead to sub-optimal allocation of resources in the industrial business. However, over the years, the workforce in the industrial sectors of developing countries has become dualistic, with rising share of contract labour, which falls outside the purview of EPL. Empirical literature in India, and elsewhere also, mainly focused on examining the productivity and employment effects of EPL, based on the assumption that the pro-worker legislation creates rigidity in labour adjustment. However, whether EPL actually creates rigidity in the dualistic context is neglected in the research. Therefore, using a state-level panel dataset from the Indian manufacturing sector for the period 1999-2000 to 2011-2012, we studied the producers' response (in terms of labour adjustment) to economic shocks. We investigated whether the producers responded differently in the states with relatively tougher EPL. We also investigated whether EPL hindered the downward labour adjustment when the producers received negative economic shocks. We used rainfall shock as a proxy for economic shock; and labour turnover as a proxy for labour adjustment. The results indicate that labour turnover is positively associated with the rainfall shocks, but we did not find any effect of EPL on it. Besides, we found that labour separation rate, which is used as a proxy for downward labour adjustment, is positively linked with negative rainfall shocks. However, we did not find any effect of EPL on labour separation rate either. Our results suggest that the pro-worker legislation did not hinder the downward labour adjustment even when the producers experienced the negative shocks.

Key words: employment protection legislation; Rainfall Shocks; labour Adjustment; Rigidity

JEL Code: K31

Introduction

Employment protection legislation (EPL) has received a great deal of attention from economists, in this phase of the global economy. The empirical literature on EPL has grown sharply over the last two decades, both in developing and developed countries. There has been a consistent call from producers and neo-liberalists for the abolition of the pro-worker legislations to gain flexibility in the labor market. Critics of pro-worker labor laws claim that EPL is one of the main factors holding back the industrial growth of developing countries. Theoretical literature in labor economics explains that EPL has the potential to hinder labour adjustment by reducing the freedom of employers to lay off workers and raising the dismissal cost (see, e.g., Nickel, 1986; Hopenhayan and Rogerson, 1993). However, the survey of the empirical evidence, offered by Betcherman (2014), reflects a mixed and inconclusive picture. While Besley and Burgess (2004), Ahsan and Pages (2009) and Adhvaryu, Chari, and Sharma (2014), among others, found a negative impact of EPL on employment and output in India, several other empirical studies concluded that it has minimal/or no impact on the industrial performance (see, for example, Bertola, 1990; Roy, 2004; Fragenas, 2010; Sarkar and Deakin, 2011). Interestingly, there is a substantial body of literature that found positive effects of EPL on labour or multifactor productivity (Belot, Boone, and Van ours, 2007; Nickell and Layard, 1999; Koeniger, 2005; and Autor, Kerry, and Kugler, 2007 etc.). Besides, researchers have argued that there is a possibility that firms may disintegrate vertically or horizontally to circumvent EPL (Bhattacharjea, 2009). Thus, whether EPL has stifled the industrial business or not, remains elusive so far in the empirical literature.

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In developing countries, like India where there exist a plethora of pro-worker labour laws on the papers, the debate on labor regulations has taken centre stage over the recent years. The Indian state echoes that the labour market in the country is too rigid, and stresses the need for pro-employer amendments in the existing labour laws to put the industrial growth at higher trajectory (SNCL, 2002). However, the research suggests that over the years, the labour market in the country has become “dualistic”², with a rising trend in the share of informal/contract workers in the formal manufacturing sector, featuring the trajectory (Sofi and Sharma, 2015ab; Sapkal, 2013; Goldar et al., 2012; Kapoor, 2014; OECD, 2007). In addition, literature hints that the Indian State has carried out stealthy reforms over time to provide more flexibility to the business without inviting resistance from labour unions (Jenkins, 1999; and Nagaraj, 2004). Empirical literature in the Indian context has mostly focused on productivity and employment effects of EPL, assuming that the latter has the potential to create rigidity in the labour adjustment (Besley and Burgess, 2004; Dougherty et al., 2013; Mitra and Ural, 2006; Gupta, Rana, and Utsav, 2009 etc.). However, whether or not EPL creates rigidity, in practice, in the dualistic labour market that India has, is yet to be unearthed. Given this backdrop, our study investigated directly whether EPL hinders labour adjustment during the economic shocks in the Indian context.

We begin with the dualism in the workforce in the Indian manufacturing sector, and argue that it leads to a productivity differential between regular and informal contract workers. We demonstrate that the effect of EPL on productivity in the empirical research gets exaggerated as researchers have missed to control for the productivity differential. We argue that the negative effects of EPL on productivity shown by some studies could be wiped out once the productivity differential led by the dualism is taken into account. Then, with the help of a state-level panel dataset for the Indian manufacturing sector, we study whether EPL has any effect on firms’ labour-adjustment response to economic shocks³. We use rainfall shocks over-time as a proxy for economic shocks, and define them in the same way as Chaurey (2015), Jayachandran (2006), Adhvaryu et al. (2014), and Kaur (2012). Positive/negative rainfall shock has the potential to generate positive/negative demand shock for the manufacturing sector through its effects on agricultural productivity. Previous literature in India indicates that the higher/lower rainfall has a positive/negative effect on agricultural yield (Kaur, 2012; Jayachandran, 2006). The effect of EPL is captured using the state-level variation in the labour law. Since “labour” as a subject is included in the concurrent list of the Indian constitution, both central government and state governments can legislate over it. Therefore, labour regulations differ significantly across the Indian states. Based on the classification of the Indian states into rigid, flexible and neutral made by Gupta et al. (2007), we created a quantitative index (henceforth, EPLI) and used it in the econometric model to capture the effects of EPL.

We used labour turnover, which is the sum of labour-separation rate and labour- accession rate, as a proxy for labour-adjustment. We also investigated whether labour-separation rate responds to negative economic shocks, and does EPL deter the response. It is important to mention that the larger portion of the Indian manufacturing sector is not covered by the EPL; therefore, an ideal sample to study the rigidity effects of the pro-worker labour law would be based on firm-level dataset. Unfortunately, data on labour turnover is not available at firm-level for the States. However, keeping the other things constant, if the rigidity of the labour law does really wield any influence on the hiring and firing policy of firms, it is possible to capture it by analyzing the aggregate data on labour turnover at the State level. We select 15 major States of India, considering the availability of the EPL Index. The data on labour turnover at the State level and the required control variables is available for the period 1999-2000 to 2011-12. Therefore, the analysis is restricted to 12 years and 15 states.

² The word “dualism” has been widely used in the recent publications to refer to the growing use of contract workers, who do not fall under the purview of EPL, in the formal manufacturing sector. (Sofi and Sharma, 2015a; and Kapoor, 2014 and Sasikumar, 2015).

³ This would make clear whether EPL creates rigidity.

We found that the rainfall shocks have increasing effect on labour turnover, indicating that firms respond to the demand shocks by adjusting the labour force. However, we did not find any effect of EPL on labour adjustment. The impact of EPL is insignificant even when the producers experienced the rainfall shocks. Further, we found that the labour-separation rate responds positively to negative rainfall shocks, which implies that the firms lay off workers in response to the negative demand shocks generated by insufficient rainfall. However, like in the earlier regression, the impact of EPL is found insignificant. We found that the EPL did not obstruct labour separation rate during the negative rainfall shocks. Thus, all these findings indicate that EPL does not have the potential to create rigidity in labour adjustment, especially in the dualistic labour market such as in the Indian manufacturing sector. The evidence of this study provides further empirical support to Fragenas (2010), Sarkar and Deakin (2011), Roy (2004), Anant et al. (2006), Bertola (1990) etc, while undermining the evidence in Besley and Burgess (2004) and the theoretical predictions in Nickel (1986) and Hopenhayn and Rogerson (1993).

Employment Protection Legislation in India

The Indian State introduced Employment protection legislation (EPL) to allow a certain degree of bargaining power to workers, and discourage unexpected dismissals due to fluctuations in the market demand. EPL may take several forms such as severance payments, requirement of permission from the government for layoffs etc. In India, the employment protection legislations are contained in the Industrial Disputes Act (IDA), 1947, which applies to the firms in the organized manufacturing sector employing 100 or more workers. Besides, some provisions of Contract Labour (Regulation and Abolition) Act, 1970 are also believed to be creating rigidity in the business. The detailed description of the various provisions under the IDA and the Contract Labour Act is given by Sofi et al. (2016). "The Chapter VII of the IDA requires the establishments to obtain permission from the government to layoff¹ the workers whose names are borne on the muster rolls of the enterprise. Under Section 25C, the workers who are laid off are entitled to compensation of 50 percent of the basic wages and dearness allowance. To be entitled to the compensation, the worker must satisfy the following conditions: (a) he must not be a 'baldi' worker or casual worker; (b) his name must be included on the muster rolls of the enterprise; (c) he must have completed 240 days of continuous service.

Similarly, Section 25-F of the Act requires establishments to issue in writing one month's notice to the worker for retrenchment², indicating the reason. It also requires employers to pay the worker (in the event of retrenchment) a compensation of 15 days' average wages for every completed year of continued services, or any part thereof in excess of 6 months. Thus, the various sections in Chapter V-B of IDA, 1947 offer a substantial amount of social security to workers.

The Contract Labour (Regulation and abolition) Act, 1970 is a central act, applying across India. Its basic aim is to regulate contract labour and to lay down provisions for the abolition of contract employment. The Act does not apply to establishments employing less than 20 workers or those performing intermittent or casual work. Under Section 10 (1) of the Contract Labour (Regulation and Abolition) Act of 1970, the government can prohibit the use of contract labour after consulting the Central or State Board. Under Section 21 of the Act, a contractor shall be responsible for the payment of wages (within a prescribed time as may be specified) to each contract worker employed by him. If the contractor fails to pay the wages to contract workers within the prescribed time, then the principal employer shall take responsibility for the payment to workers, and later recover the amount from the contractor. The Act also provides for wage parity between contract workers and directly employed workers if they do same work. In general, the wages of contract workers must not be lower than the prescribed minimum wages. As per the rules, whoever breaches any provision of the Contract Labour Act, 1970 shall be punished with imprisonment extending up to three months or with a fine of rupees up to one thousand, or with both" (Sofi et al., 2016).

Is EPL too rigid on the paper in India?

Based, primarily, on the above-mentioned labour laws, India is considered as one of the countries with stringent labour market (OECD, 2007). However, the question arises: Are these pro-worker labour laws too rigid? And do they really have the potential to harm the efficiency/productivity in the business? Let us investigate conceptually. Theoretically, job security legislation can hurt efficiency in the business if it impinges on the desired employment adjustment of firms (Nickel, 1986; Hopenhayn and Rogerson, 1993; Garibaldi, 1998). Restricting freedom of employers to fire out workers when market demand is low would amount to the sub-optimal size of labour in the firm, causing a decline in output per worker besides affecting the overall efficiency (ibid). The need of employment adjustment arises especially in the non-perennial (seasonal) and non-core activities of the business. Besides, fluctuations in the market demand may require firms to adjust employment in the activities that are highly susceptible to market volatility. In this connection, the question arises: Is the EPL system in India too rigid to restrict employment adjustment and lead to the sub-optimal size of labour? The better answer can be worked out only through an empirical analysis. However, we attempt get some insight by going through the provisions of the Industrial Disputes Act (IDA), 1947, the Contract Labour Act (CLA), 1970 and the anecdotal evidence. EPL in India, in the first place, does not apply to workers engaged in non-core and non-perennial activities of the business. The employers are free to use contract labour in such activities – labour laws do not cover contractual workers. According to the official ASI (Annual Survey of Industries) data, the use of contract labour has gone up to 35 % in 2011-2012 from 20 percent in 1999 (see figure 1). Contract labour is not only engaged in non-core activities but also in core activities of the business, despite being prohibited by the law (NCEUS, 2009). Thus, the question of rigidity does not arise in this context. Moreover, research shows that the Indian state has carried out stealthy labour reforms over time, which involves the subtle changes in labour laws by administrative orders, yielding substantial leeway for employers, without inviting large-scale resistance from the organized labour (Jenkins, 2010).

Besides, the various provisions in favour of labour have been diluted over time by the Supreme Court orders and the state level court decisions. For example, let us discuss the wage parity clause in the Contract Labour Act (CLA), 1970. In the case of Hindustan Steelworks Construction Ltd. vs. Commissioner of Labour and Others, 1996 LLR, 865(SC) pertaining to the payment of lesser wages to the contract workers who performed the same work as regular workers did, the court did not hold the principal employer responsible (as required by the CLA) for the payment of the wages/shortfall amount (Das, Homagni, and Javir, 2015). Similarly, in the case of the Uttar Pradesh RajyaVidyutUtpadan Board vs. Uttar Pradesh VidyutMazdoorSangh (2009) 17 SCC 318.32, the court maintained that the nature of work cannot be gauged merely by looking into the volume of the work, as there always may be qualitative differences ranging from responsibility to reliability attached with the work (see also Das et al., 2015). This has led to a glaring exploitation of non-regular workers in terms of lesser wages and denial of other employment benefits. The average daily earning of non-regular workers is 30 percent lower than that of the regular workers. (See Sofi and Sharma, 2015).

Likewise, with regard to the abolition (of contract labour) clause of the CLA, 1970, contradictory decisions have been passed by the courts, tilting the balance of power in favour of employers. For example, as per the initial judicial interpretation (as in Air India Statutory Corporation v. United Labour Union (1997) (9) SCC 377), the principal employer was required to absorb the workers (who lose their jobs on the abolition of contract employment) in his/her enterprise as a regular worker. However, in its judgment, the Steel Authority of India V. National Union Water Front Workers AIR 2001 SC 3527 maintained categorically that it was not compulsory for the principal employer of contract labour to absorb the work after the government abolished the contractual employment.

Previous Empirical Literature

The empirical investigation of the economic effects of labour laws generally happens to be susceptible to a multiplicity of limitations arising due to the complexity in interpretation and quantification of labour laws. In developing countries, like India, labour laws might exist in large numbers but their

implementation may be all but ineffective. In such a situation, it is too challenging to unearth the accurate effect of labour laws through empirical studies. However, since the debates on labour laws have taken center stage in this phase of the global economy, researchers have adopted the latest tools of statistics and econometrics in an attempt to capture the effects of labour laws on several aspects of the industrial business.

Broadly, econometricians relied upon two types of methodologies to investigate the economic effects of labour laws in India. One is called 'before and after', and the other is the Leximetrics approach. In the Indian context, Fallon and Lucas (1991) and Roy (2004) followed the former approach to study the impact of EPL on the industrial performance. Under this approach, while using the pro-worker amendments (in 1976) to the Industrial Disputes Act, 1947, the authors assigned dummy 1 for the period post-1976 and zero for the pre-1976 to capture the impact. This approach has been fiercely criticized, as it did not allow the researchers to take into account labor reform activities that occurred over time. Besides, the approach also overlooked the implementation aspect.

The major breakthrough came in 2004 when Besley and Burgess (2004) adopted the Leximetrics approach⁴ to measuring the economic effects of labor laws on industrial performance. Taking this approach, Besley and Burgess (2004) studied the existing labor laws especially those related to the job security and constructed an index for the 15 major states of India. The index is constructed using the amendments undertaken by the state government to existing body of labour laws. The scoring/coding is based on reading all the state level amendments to the Industrial Disputes Act of 1947 from Malik (1997). The authors categorized the amendments that were carried out between 1952 and 1992 into three classifications – pro-worker, pro-employer, or neutral; and then assigned quantitative scores to each type of amendment. Using that index in a three-dimensional panel model along with several control variables, Besley and Burgess (2004) found that job security regulations have a negative impact on output growth and employment in the Indian manufacturing sector. The Leximetrics approach has been extensively used in the Indian context and elsewhere to investigate the productivity effects of EPL. Dougherty et al. (2013) in his firm level analysis for the Indian manufacturing sector found a higher total factor productivity in the firms operating in states with the flexible labor market. Similarly, using the Besley and Burgess's index, Mitra and Ural (2006) found a positive effect of industrial de-licensing on labour and total factor productivity, in relatively flexible states.

Although theoretical literature underlying the debate on EPL is clear about on the firing cost can translate into rigidity, its implications on labor productivity or total factor productivity (TFP) are ambiguous. Likewise, the empirical finding of a negative impact of EPL on productivity in the previous literature is not supported with a convincing explanation. Interestingly, Pierre (2013) found that the firms facing tight employment protection invested more in training and skill enhancement of the permanent workers covered by labor laws. Since training has a positive effect on labour productivity, the finding of this study thus indicates that productivity is likely to be positively linked with EPL. Similarly, in their empirical study on the Indian manufacturing sector, Sofi and Sharma (2015) found that the industries having a relatively higher share of permanent workers experienced higher productivity as compared to the industries using a higher number of non-regular workers. On the other hand, in his empirical study based on Indian manufacturing sector, Roy (2004) found that EPL did not significantly create rigidity in employment adjustment. Likewise, Fragenas (2010) and Sarkar and Deakin (2011) did not find any bad effect of EPL in India, in their empirical studies⁵. Therefore, the question arises what explains the relatively lesser productivity (as found in some studies mentioned earlier) in states that amended their labour laws in the pro-worker direction? Under this backdrop, the major questions that

⁴Leximetrics is a method that attempts to rank the strength or weaknesses of laws, by assigning a numerical value to each type of law in a particular field. The numbers are then used to compare the efficacy of different legal systems, and to see how these numbers correlate with particular goals such as economic growth or employment (wikipedia).

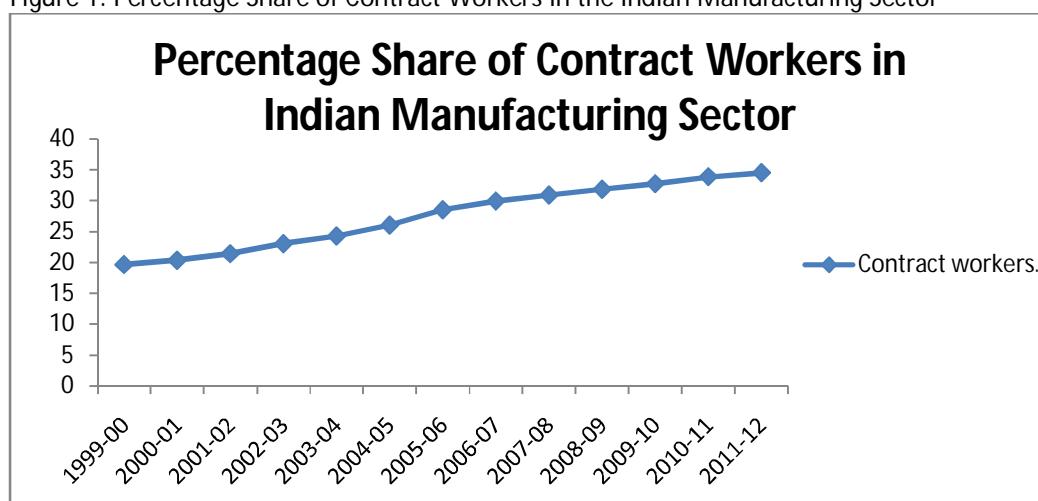
⁵ Along the similar line, Anant, Hasan, Nagaraj, and Sasikumar (2006) argued that the widespread rise in unemployment in Asia cannot be attributed to labour laws, though reforms are necessary in some areas.

arise are: is the negative evidence (of the impact of EPL on productivity) in some of the empirical literature, which is mostly based on Leximetrics approach, spurious? How much should we trust them? We investigate these questions in the following section. We show that there has been an increasing dualism in the workforce (co-existence of formal and informal labour³) in the contemporary labour markets across developing as well as developed countries. The upward trajectory of informal workers, who do not fall under the purview of EPL, gives rise to productivity differential between the two types of labor inputs. We present the survey of studies showing employers evading the EPL by using informal labour, which includes contract workers, casual workers, and short-term fixed contracts. Then, in that context, we show that the estimates of the effect of EPL drawn without controlling for the productivity differential between formal and informal workers can seriously mislead as it is likely to overestimate the productivity effects of the labour law.

Labour market dualism and productivity differential

In this neo-liberal phase of the global economy, the employment of flexible labour force, which does not fall under the purview of labour laws, has grown rapidly not only in developing countries but also in developed economies as well such as OECD countries (OECD, 2009). Informal employment has gone up notably in the European and the Scandinavian countries also (CIETT 2007). For example, in the Canadian labor market, jobs have become more precarious with the upward trend in temporary (or contract) employment, which is not covered by the labor laws (Cranford, 2003). Between 1997 and 2003, temporary employment in Canada has increased twice as fast as regular employment (Fuller, 2007). The same is the case with Australia (Campbell, 2001). In India, contractual employment, which does not fall under the ambit of EPL, has gone up from 20 in 1999-2000 to 35 percent in 2010-11 (see figure 1). The share of contract workers in the Indian manufacturing sector was just 13 percent in 1993-94 (Sunder, 2012). Employers have been justifying the in-formalisation of employment by invoking the rigidity school of thought and the need of flexibility in the business in this global economy⁶. In India, this line of thought is echoed by the state as well (see, for example, SNCL 2002).

Figure 1: Percentage Share of Contract Workers in the Indian Manufacturing Sector



Source: Annual Survey of Industries (ASI).

⁶ In his empirical study, Fragenas (2010) concludes that the evidence is not strong and robust enough to confirm the much claimed negative relationship between the pro-worker judicial change and the degree of formal work in the industrial sectors. However, Sofi et al., (2016) finds higher informalisation in the states with relatively tougher EPL, but concludes that it is because of the aggressive business strategies adopted by employers rather than rigidity of the labour laws.

Contractual employment may bring flexibility in employment adjustments; however, whether contractual labour augurs well for the efficiency and competitiveness of the firms remains a subject of debates on the emerging trends in the labour market. There is a substantial literature showing that the contractualisation of the labour force is bad for productivity or efficiency of firms. For example, in his theoretical model, Maiti (2013) shows that contractual employment has a negative effect on productivity though it may help the employers to save on wage bills. Likewise, Sofi and Sharma (2015a, b) discuss number of reasons to believe that the permanent workers have higher productivity relatively to non-permanent workers. They also show that the labour productivity falls in industries with the relatively lesser permanent labour force. Similar kind of evidence is also found in (Kleinknecht et al., 2006). Given the evidence, it can be concluded that contractual and permanent workers differ in terms of their productivity. The same is indicated by Saha et al. (2013) when it treats the contract labour as inferior labour input. The productivity differential exists due to several reasons such as a lack of on-campus training for contract workers, low standard working conditions and lower wages – these factors are directly related to labour productivity.

Having discussed the labour market dualism and the consequent productivity differential, let us now discuss their implications on the empirical findings related to EPL, if not taken care of.

The above-mentioned studies, which investigated the productivity effects of EPL through the Leximetrics approach, have adopted the following empirical specification.

$$y_{ist} = a_0 + a_1 EPLI_s + X\beta_k + \varepsilon_{ist}$$

Where y_{ist} is labour productivity or total factor productivity (TFP) in firm '*i*', state '*s*' and year '*t*'. This kind of regression is what economists call as three-dimensional panel regression with *y* having three subscripts. Using this specification, researchers study the behavior of firms/or industries across various states or countries with varying levels of JSRs. The EPLI in the regression represents the index of EPL calculated by the Leximetrics method. The quantitative index is generally in the form of three-category variable – '-1', '1', or '0', representing the flexible, rigid or neutral state, respectively. However, some studies have put it in the form of a dummy variable with value '1' if the given state is rigid, or zero otherwise. Or, it could appear the opposite of it, depending upon the perspective of the researcher.

$X\beta_k$ is the vector of state-specific and industry-specific control variables. The coefficient on EPLI (i.e., a_1) is interpreted as the impact of an increase in stringency of EPL on labour productivity or TFP, or it captures the productivity in firms operating in the rigid states.

There is a substantial body of literature that shows that employers evade the EPL by using the contract workers, which, as mentioned earlier, does not fall under the purview of labour laws. Literature shows that in the states with tougher EPL, the employers have used a relatively higher share of contractual employment (see e.g. Sofi, 2015a; Chaurey, 2015; Sapkal, 2014, Saha et al., 2013, Goldar and Aggarwal, 2012). Since the productivity differential exists between contractual workers and the formal regular worker,, the productivity in firms operating in the states with tougher EPL is likely to be lower because of the higher usage of the inferior input. Thus, we are presented with a situation where the firms with relatively lesser productivity have a relatively higher share of contract workers; and the firms with a relatively higher share of contract workers are operating in the states with rigid labour laws. Therefore, it is crucial for a researcher to control the productivity differential between the formal and the informal

workers; otherwise, the coefficient a_1 is bound to be negative as it absorbs the effect of it (productivity differential). The existing empirical literature in India or elsewhere disregarded this phenomenon, and many studies come up with negative effects of EPL on productivity, without giving a convincing explanation to support the evidence.

In the next section, to study whether EPL creates rigidity in the manufacturing sector, we investigate whether the response (in terms of labour-adjustment) of firms to rainfall shocks is linked with labour laws.

Methodology

In this section, using state-level panel econometric model, we study the response of firms (in terms of labour-adjustment) to rainfall shocks and examine whether EPL has any impact. Besides, we also investigate whether 'labour separation rate' is associated with rainfall shocks, and try to find out if there is any differential effect in the states with a relatively tougher EPL. Thus, we run two basic regressions. We use data on labour turnover as a proxy for labour-adjustment. Rainfall shocks have the potential to generate negative or positive demand shocks for the manufacturing sector, through their impact on agriculture productivity. Previous literature in India suggests that low rainfall affects agricultural productivity negatively, while higher rainfall is a positive shock to the agriculture⁷ (Kaur, 2012; Jayachandran, 2006). We define rainfall shock, largely the same way as Chaurey (2015), Kaur (2012), Adhvaryu et al. (2014), and Jayachandran (2006). This follows as under:

Positive rainfall-shock = When the annual state-rainfall is greater than the 85th percentile.

Negative rainfall-shock = When the annual state-rainfall is less than the 15th percentile.

No Shock = When the annual state rainfall is between the 15th and 85th percentile.

Although our approach of defining and categorizing the rainfall shock is broadly similar to the previous literature mentioned above, we use it differently in the econometric model, as discussed in this section.

EPL Index

To capture the effect of EPL, we follow the same approach as we followed in Sofi and Sharma (2016), and Sofi and Sharma (2015 a,b). It is described as under:

"We followed the Leximetrics approach as followed by Besley and Burgess (2004) and Gupta, Rana, and Utsav (2009) besides using the OECD Index (OECD 2007). Besley and Burgess (2004) examined the existing labour laws, especially those related to job security, and constructed an index, which reflects the labour market stringency of 15 major states of India. They constructed the index by using the amendments to the existing body of labour laws undertaken by the state government. They categorized the amendments (carried out between 1952 and 1992) into three classes – pro-worker, pro-employer and neutral, and then assigned quantitative scores to each type of amendment. The scoring/coding is based on reading the state-level amendments to the Industrial Disputes Act, 1947 from Malik (1997). The Index is widely used in the literature. However, Bhattacharjea (2006) argued that the Index is based on faulty coding system, and pointed out several misinterpretations of the labour laws made by Besley and Burgess (2004). To go around the limitations in the Besley and Burgess Index, Gupta, Rana, and Utsav (2009) classified the 15 Indian states into three categories – Rigid, Flexible, and Neutral – after incorporating the criticisms of the Besley and Burgess Index. To draw the classifications, Gupta, Rana, and Utsav (2009) drew on the OECD Index (OECD 2007) and Bhattacharjea (2006) besides using the BB Index. The study drew three classifications of the states – named after OECD Index, BB Index and AB (Aditya Bhattacharjea), respectively. Following which, the study applies the majority rule, assigning score '1' if a given state is picked as Flexible at least in two out of three classifications. Likewise, a state is assigned score '-1' or '0' if the majority picks it as Rigid or Neutral, respectively. In this study, to construct a quantitative index for the state-wise labour laws, we used the classifications drawn by

⁷ Previous literature has used the benchmark of 80th percentile at the upper level and 20th percentile at the lower level to define the positive and negative shocks, respectively. But we found pronounced effect of positive and negative shocks at the benchmark of the 85th and the 15th percentile, respectively. One may argue that an extreme rainfall could lead to floods and, thereby, affect the agricultural yield negatively. However, excessive rainfall would lead to extreme flooding only in the exceptional cases (see Jayachandran, 2006, and Das, 1995 for the similar standpoint).

Gupta, Rana, and Utsav (2009) in the same way. However, we slightly departed from Gupta, Rana, and Utsav (2009) in that we assigned score '-1' to Flexible states, '1' to Rigid states and '0' to Neutral states because our analysis is carried out from the rigidity perspective. Gupta, Rana, and Utsav (2009) carried their study from the flexibility perspective, as they were interested to find out if the labour reforms in India benefited the industrial sector. Thus, the EPL index, given in the fifth column of the Table 1, is increasing in rigidity. That is, higher the numerical value, the stringent is the labour market in the state, unlike the index used by Gupta, Rana, and Utsav (2009), which is increasing in flexibility" (Sofi and Sharma, 2016).

The Gupta et al.'s approach of using the majority rule to construct an EPL index has many merits. First, it weeds out the potential errors that might be individually subject to the studies mentioned above. And second, since we take into account the OECD Index in the majority rule, which is concerned with the implementation side of the labour law, the differences in the implementation at the state-level are automatically taken care of. However, as argued by Gupta et al. (2009), there have been no significant labour reforms since 1992 to until recently.

The BB Index was modified by the authors slightly. First, as noted by Bhattacharjea (2006), Gujarat is designated as "Rigid" by the BB index on account of a single inconsequential amendment. Therefore, the State is picked as neutral and score '0' is assigned to it. Likewise, the average value of cumulative scores under the BB method for Madhya Pradesh is very close to zero. Therefore, it is effectively treated as neutral and hence assigned score '0'." (Gupta et al., 2009).

Table 1: Employment Protection Legislation Index (EPLI)

State	BB index	Bhattacharjea (2006)	OECD index	EPLI
Assam	0	0	Rigid	0
Andhra Pradesh	Flexible	0	Flexible	-1
Bihar	0	0	Rigid	0
Gujarat	0*	0	Flexible	0
Haryana	0	0	Flexible	0
Karnataka	Flexible	Flexible 0	-1	
Kerala	Flexible	0	Rigid	0
Madhya Pradesh	0*	0	0	0
Maharashtra	Rigid	Rigid	Rigid	1
Orissa	Rigid	Rigid	0	1
Punjab	0	0	0	0
Rajasthan	Flexible	0	Flexible	-1
Tamil Nadu	Flexible	Flexible 0	-1	
Utter Pradesh	0	Flexible Flexible	-1	
West Bengal	Rigid	0	Rigid	1

Note: (a) The basic classifications given in this Table (BB index; Bhattacharjea; and OECD index) are actually taken from Gupta et al. (2007). The second classification (i.e. Bhattacharjea) is not drawn by the author (Bhattacharjea) himself, but by Gupta et al. (2007). However, to derive the classification, Gupta et al. (2007) drew on Bhattacharjea (2006), which criticizes the methodology followed by Besley and Burgess (2004) to construct the Index. Gupta et al. (2007) named the classification after AB (AdityaBhattacharjea).

(b) *Original coding was changed based on narrative/evidence from other studies.

(c) State gets code '-1' if majority of the classifications (i.e. at least two out of three) designate it as a flexible state. Likewise, the state gets '1' or '0' if majority designates it as rigid or neutral, respectively. The EPLI index in the fifth column of this table differ from that of Gupta et al. (2007) in that they assign '1' if the state is listed as flexible by at least two classifications, and '-1' if it is listed as rigid, and '0' if

neutral. In this table the Index is increasing in the degree of rigidity, while in Gupta et al.'s, it is increasing in the degree of flexibility. We are interested in estimating the effect of rigidity of the labour laws on migrant labour.

Empirical Model

The basic econometric specification is given as under:

$$y_{st} = \alpha_0 + \alpha_1 \text{Rainshock}_{st} + \alpha_2 \text{EPLI}_s + \alpha_3 \text{Rainshock}_{st} * \text{EPLI}_s + \alpha_k X_{kst} + \delta_t + \varepsilon_{st} \quad (1)$$

Where, EPLI_s is a time-invariant index reflecting the stringency/rigidity of EPL at the State level. The Index is increasing in rigidity. y_{st} is the log of labour turnover, which is the summation of separation and accession rates. In this regression, RainShock is a time-variant dummy variable, which takes the value 1 in a given year if it is either positive shock or negative shock, and 0 otherwise. The dummy follows from the logic that while positive shocks may lead to increase in the accession rate due to increase in hiring, negative shocks are expected to increase layoffs and, hence, labour separation rate. Thus, in both the cases, it is expected that the labour- turnover would rise. On the other hand, rainfall in the medium quantity is likely to keep labour turnover lesser. Therefore, we assign dummy 1 when there is a rainfall shock (whether positive or negative) and 0 otherwise. It is important to note here that if a given year does not register any shock, but follows a year with rainfall shock, then it is assigned dummy 1 because it would require firms to adjust the labour force. The subsequent years without any shock get dummy 0 as there would be no need to adjust the labour. δ_t represents the time trend.

The coefficient α_1 would capture the effect of rainfall shocks on labour turnover, indicating whether firms respond to demand shocks. The coefficient on EPLI (α_2) would capture the effect of the labour law (or labour market rigidity). To examine whether the response of firms, in terms of labour adjustment, to the shocks is influenced by EPL, we interact the RainfallShock with the EPL Index. The coefficient on the Interaction (α_3) captures the impact of rainfall shocks on labour turnover in the states with relatively tougher EPL since the Index is increasing in rigidity.

Since EPLI is a time-invariant variable, it is not possible to estimate the Fixed Effect model as the STATA automatically wipes out the main effect of the variable that remains constant overtime. However, the inclusion of Fixed Effect is possible if the variable is interacted with any time-variant variable, but the model must not include its main effect separately. Since we necessarily have to include the main effect of the EPLI, therefore, in this regression we estimated the Random Effect Model.

We also study the differential response of the producers (in terms of labour separation) to negative rainfall shocks, in the states with tougher EPL. This would help us to see whether EPL creates rigidity in India when the employers need downward labour adjustment because of the negative shocks. To investigate that, we estimate the following model:

$$y_{st} = \alpha_0 + \alpha_1 \text{NegativeRainshock}_{st} + \alpha_2 \text{NegativeRainShock}_{st} * \text{EPLI}_s + \alpha_k X_{kst} + \gamma_s + \lambda_t + \varepsilon_{st} \quad (2)$$

Where y_{st} is the labour separation rate. The coefficient on the interaction (α_2) captures the differential effect of RainShock on labour separation rate, in the states with relatively tougher EPL. In the above equation, since we are only interested to see the differential impact of Rainshocks across the states with tougher EPL, we can afford to exclude the main effect of the EPLI. This enables us to include fixed effects in the model as the EPLI is interacted with the RainShock, which is a time-variant variable. However, to look at the main effect of the EPLI on the dependent variable, we also run a separate regression, using the random effects model.

Control Variables

To remove the omitted variable bias, we include a set of control variables in each model, represented by $\alpha_k X_{kst}$. These include the ratio of the number of strikes to the number of lockouts, labour absenteeism rate, net value added (NVA) and labour cost. The ratio of strikes to lockouts has been used in the previous literature as a proxy for labour union strength, which determines labour turnover by influencing labour separation rate and accession rate (see Roy, 2004; and Saha et al., 2015). Higher number of strikes relatively to lockouts indicates higher strength of labour unions. However, the sign of the coefficient on the strikes/lockouts ratio depends on their relative success. If strikes are relatively more successful, layoffs and quits would be lower, and the accession rate needed for replacement would also be lower. Therefore, in that case, the coefficient on strikes/lockouts is expected to be negative. On the other hand, if strikes are unsuccessful, the layoffs and quits would be higher, resulting into higher accession rate because of the need of replacement. In this case, the coefficient on the ratio of strikes/lockouts is expected to be positive.

We also control for labour absenteeism rate because some producers would be prompted to go for recruitment if the rate is higher. The coefficient on the absenteeism rate is, therefore, expected to be positive. Labour turnover is expected to vary with the size of production; therefore, we controlled for net value added. And finally, we also controlled for labour cost. Both these two variables are adjusted for inflation using the relevant series of the Whole Sale price Index (WPI).

Data Source

Data on the labour turnover, labour separation rate, and the control variables at the state level are available for time period 1999-00 to 2011-12 at various sources such as Central Statistical Organisation (CSO), Labour Bureau, Government of India, CMIE etc. And the rainfall data is available at the Indian Meteorological Department and Center for Climatic Research, University of Delaware.

Empirical Results

To examine the response of producers (in terms of labour adjustment) to rainfall shocks, and the effect of EPL on it, we estimate four regressions. The results are shown in Table 2, column 2-5. The dependent variable in each of these regressions is labour turnover (sum of labour separation rate and accession rate), which is used as a proxy for labour adjustment. In the first regressions (see in column 2, Table 2), we examine whether there is any association between rainfall shocks – they may be either positive or negative – and EPL. We identify a significant positive coefficient on Rainfall Shocks, indicating that labour turnover increases when the producers experience the shocks. This implies that the positive or negative rainfall shocks are strong enough to force producers to adjust the labour. In the second regression, we have included three control variables: ratio of strikes to lockouts (a proxy for labour union strength), labour absenteeism rate, and Net Value Added. Besides, we have also included time trend in the model. However, the coefficient on the Rainfall Shocks is still positive and significant (see column 3, Table 2). To investigate whether the producers respond to rainfall shocks differently in the states with relatively tougher EPL or not, we interacted Rainfall Shocks with the EPLI. The coefficient on the interaction is negative but insignificant (see in column 4 of Table 2), which indicates that EPL does not hinder labour adjustment. In other words, producers do not respond differently in the states with relatively tougher EPL. In the column 5 of Table 2, we included the control variables and time trend, but the coefficient on the interaction remains almost the same. The coefficient on the ratio of the number of strikes to lockouts in each of these regressions is positive and significant which indicates that strikes have failed to redress the employee grievances, leading to higher lay-offs and quits. Therefore, the labour turnover is positively associated with the ratio of strikes to lockouts. The coefficient on the labour absenteeism rate has a positive sign, as has been expected, but it is not significant. The results in the column 3 and 5 of Table 2 show that the labour turnover is positively associated with net value added.

In these regressions, we could not include the Fixed Effects in the model because the EPL Index (EPLI) is a time-invariant variable, which is wiped out in that specification. Therefore, we estimated the Random Effects Model.

Table 2: Responsiveness of labour turnover in manufacturing sector to Rainfall shocks, across states with different size of employment protection legislations.

Independent Variables	Dependent Variable: Log of labour turnover			
Constant	1.436*** (0.060)	0.760*** (0.216)	1.420 (0.063)***	0.743*** (0.216)
Rainfall Shocks	0.030** (0.015)	0.274** (0.015)	0.032** (0.015)	0.311** (0.015)
EPLI	----	----	-0.116 (0.086)	-0.099 (0.089)
EPLI*Rainfall Shocks	----	----	0.019 (0.021)	0.027 (0.021)
Control Variables				
Log of Strikes/Lockouts	----	0.063*** (0.022)	----	0.065*** (0.023)
Log of Net Value Added	----	0.099*** (0.030)	----	0.099*** (0.030)
Log of Labour Absenteeism rate	----	0.052 (0.072)	----	0.055 (0.072)
Number of observations	180	161	180	161
R-sq	0.013	0.167	0.091	0.208
Time Trend	Yes	Yes	Yes	Yes

Note: (a) Figures in the parenthesis are standard errors.

(b) * = $p < 0.10$, ** = $p < 0.05$, and *** = $p < 0.01$.

To investigate whether EPL hinders labour separation rate (i.e., downward labour adjustments), we regressed it on the EPLI to see the association. Then, we interacted the EPLI with the negative rainfall shocks to see if there is any differential response. The results in the column 2 and 3 of Table 3 show that the labour separation rate has a negative association with the EPLI, but the coefficient is insignificant. Like in the earlier regressions, we could not include fixed effect in this regression also because the EPLI is time-invariant variable. However, we have controlled for the ratio of the number of strikes to lockouts, labour absenteeism rate, net value added and labour cost. Having assessed the association between labour separation rate and EPL, which we found insignificant, we now turn to examining the differential impact of negative rainfall shocks on the labour separation rate in the relatively tougher EPL states. We run 3 regressions. In the first regression (see the column 2, Table 4), we introduced only negative rainfall shocks to see their association with the labour separation rate. The result in the column 2 shows that there is a significant positive association between labour separation rate and the negative rainfall shocks. In other words, the producers carried out downward labour adjustment when they received negative rainfall shocks. Then, we introduced the interaction between EPLI and negative rainfall shocks. Since our motive is to only examine the differential response, we excluded the main effect of the EPLI from these regressions⁸. This method allowed us to include the fixed effects in the model. The result in the column 3 of Table 4 does not show a significant differential response. The coefficient on the interaction is negative, but not significant, which implies that EPL does not create rigidity in the

⁸ There are handful number of studies that have not included the main effect of EPLI in the regression when they motive was only to examine the differential response (see, e.g., Chaurey, 2015 and Gupta et al., 2009). This method allowed us to include the fixed effects in the model.

downward labour adjustments when producers are facing negative rainfall shocks. In these regressions, we did not include control variables since we were able to include the fixed effects in the model. The inclusion of the control variables would have reduced the degrees of freedom, which have already been reduced due to the inclusion of the fixed effects. However, the inclusion of control variables alongside fixed effects would be preferable had the sample size been very large. Unfortunately, our sample size is small. We included both time effects and fixed effects besides a time trend. In the third regression, we conducted robustness check by estimating the Random Effect Model (REM), while including the main effect of the EPLI as well. Unlike the Fixed Effect Model (FEM), the Random Effect Model does allow us to include the main effect of the time-invariant EPLI variable. The results are robust, with insignificant coefficients on both the EPLI and the interaction term, though they are negative.

Thus, our study did not identify any effect of EPL. However, interestingly, our results suggest that the producers are prompted to adjust the labour force when they experience economic shocks. Also, our results indicate that the negative rainfall shocks induce downward labour adjustment, but there is no indication of a differential response in the states with a relatively tougher EPL.

Table 3: Responsiveness of labour separation rate in manufacturing sector to Rainfall shocks, across states with varying size of employment protection legislations.

Independent Variables	Dependent Variable: Log of Labour Separation Rate	
Constant	1.112*** (0.070)	1.315*** (0.375)
EPLI	-0.091 (0.094)	-0.071 (0.070)
Log of Strikes/Lockouts	----	0.058** (0.024)
Log of Net Value Added	----	-0.001 (0.058)
Log of Labour Absenteeism rate	----	0.133** (0.077)
Log of Labour Cost	----	-0.170* (0.106)
Number of observations	180	161
R-sq	0.059	0.111
Time Trend	0.002 (0.002)	0.009* (0.005)

Note: (a) Figures in the parenthesis are standard errors.

(b) *= $p < 0.10$, **= $p < 0.05$, and ***= $p < 0.01$.

Table 4: Responsiveness of labour separation rate in manufacturing sector to Rainfall shocks, across states with varying size of employment protection legislations.

Independent Variables	Dependent Variable: Log of labour separation rates		
Constant	1.164*** (0.026)	1.165*** (0.026)	1.153*** (0.076)
Negative Rainfall Shock(lag1)	0.038** (0.019)	0.039** (0.019)	0.039** (0.019)
EPLI	----	----	-0.087

			(0.099)
EPL*Negative Rainfall Shocks(lag1)	----	-0.011 (0.026)	-0.011 (0.025)
State Fixed Effects	Yes	Yes	No
Year Fixed Effects	Yes	Yes	Yes
Number of observations	165	165	165
R-sq	0.011	0.017	0.070
Time Trend	-0.001 (0.003)	-0.001 (0.003)	No

Note: (a) Figures in the parenthesis are standard errors.

(b) *= $p < 0.10$, **= $p < 0.05$, and ***= $p < 0.01$. (c) We excluded fixed effects in the third regression (4th column) so that we can include the main effect of the EPL as well.

Conclusion

In this study, we attempted to unearth whether employment protection legislation (EPL) creates rigidity in labour adjustment in the Indian context. We investigated whether economic shocks, which are proxied by rainfall shocks, prompt the producers to adjust the labour force. Then, we investigated whether the response is linked with EPL or not. Similarly, we assessed the effect of negative rainfall shocks on labour separation rate – a proxy for downward labour adjustment – and investigated whether or not a differential impact exists in the states with a relatively tougher EPL. Our results show that the producers were prompted to adjust the labour force when they experienced the economic shocks. However, no differential response is identified in the states with relatively tougher EPL. Further, our results suggest that the negative rainfall shocks induced downward labour adjustment, but no impact of EPL was identified in this case either. Thus, no rigidity effect of EPL was identified in the Indian manufacturing sector with dualism in the labour force.

The finding of this study has great implications for the theoretical as well as the empirical literature on EPL. The basic approach of the previous empirical studies in the Indian context, and elsewhere also, has mainly been to looking at the productivity and output effects of EPL. In the cases where researchers found a negative coefficient on EPL, they justified the finding by invoking the "rigidity line of thought". However, neither the empirical literature nor the theoretical gives a convincing answer to the question of how does labour productivity (or multi-factor productivity) fall if the EPL is rigid. More importantly, analyzing the productivity/or output effects of EPL in a state-level analysis always raises serious endogeneity concerns, which are too complex to be taken care off – previous literature, too, failed to offer a convincing solution in this regard. Besides, as we argued, the dualism in the labour force raises the issue of 'productivity differential' between regular and contract workers that exaggerates the effect of EPL as the coefficient on the latter absorbs the effect of the former. Therefore, by examining directly whether EPL hampers labour adjustment or not, this study adds significantly to the previous literature. However, as we have not identified any rigidity effect of EPL on labour adjustment, the evidence of this study puts a question mark over the finding of negative productivity/out effects identified by some previous studies in the Indian context. Our evidence provides further empirical support to Fragenas (2010), Sarkar and Deakin (2011), Roy (2004), Anant et al. (2006), Bertola (1990) etc, while undermining the evidence in Besley and Burgess (2004) and the theoretical predictions in Nickel (1986) and Hopenhayan and Rogerson (1993).

Over the years, labour markets across countries have become dualistic, with rising trend in the share of informal/contract workers featuring the trajectory (Sofi and Sharma, 2015; OECD, 2007 and Sasikumar, 2015). In the Indian context, as per the annual surveys of industries (ASI), the share of contract workers, which do not fall under the purview of EPL, has increased from 13 percent in 1993-94 to 35 percent in 2010-11. Contract workers are subject to poor working conditions, job insecurity, and lower wages. The

daily earnings of contract workers are 30 percent lower than that of the regular workers. Apart from the de facto flexibility that producers enjoy in India due to the poor implementation of labour laws, the current labour law in the country allows substantial de jure flexibility to the employers – as argued in this paper. Moreover, literature also suggests that the Indian state has over the years carried out stealthy labour reforms, and the courts have mostly issued pro-employer decisions regarding labour disputes. All this has yielded substantial flexibility to producers. Therefore, the ‘rigidity line of thought’ behind the consistent demand for reforms to make the labour market more flexible does not carry much merit in the Indian context. However, the colossal size of the labour laws in India needs to be brought down to an optimal amount, and the compliance procedure must be made simple. More importantly, the debate on labour market regulations must primarily focus on the alarming trend of informalization that India has registered, over last the two decades, in the formal manufacturing sector.

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