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Article

Institutionalist versus distortionist views of labor market reforms: An investigation into the post-liberalized manufacturing sector in India☆

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ABSTRACT

Labor regulation and employment relation has been investigated in India in light of the seminal work of Besley and Burgess (2004), considering formal sector manufacturing employment as the explained variable. Empirical findings support, although not very strongly, the institutionalist view, i.e., pro-worker amendment in labour laws induces employment. Among the other factors, real wage rate has significant negative effect on employment, whereas that for real per capita developmental capital expenditure, per capita electricity generation capacity and real per capita net state domestic product is significant positive. However, effect of per capita real developmental revenue expenditure is inconclusive. In other words, although it improves employability of workers through their human capital improvement, which is probably met up at the cost of worsening overall infrastructural development, through reducing corresponding capital expenditure! Supporting evidence has also been provided favoring this conjecture.

Visión institucionalista versus distorsionista de las reformas del mercado laboral: una investigación del sector manufacturero post-liberalizado en la India

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RESUMEN

La normativa y la regulación laboral se han investigado en la India a raíz del trabajo original de Besley y Burguess (2004), tomando como variable el empleo formal en el sector manufacturero. Los hallazgos empíricos respaldan, aunque no rotundamente, la visión institucionalista, es decir, que la enmienda a favor del trabajador en la legislación laboral fomenta el empleo. Entre otros factores, la tasa de salario real tiene un impacto significativamente negativo en el empleo, mientras que para la inversión de capital de desarrollo per cápita, la capacidad de generación de electricidad per cápita y el producto interno es significativamente positiva. No obstante, el efecto del costo de los ingresos del desarrollo real per cápita no es concluyente. En otras palabras, si bien esto favorezca la inserción laboral de los trabajadores con una mejora del capital humano, probablemente se consiga a costa de empeorar el desarrollo de infraestructura al reducir la inversión en capital correspondiente. Se presenta evidencia que avala esta conjetura.

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1. Introduction

India's manufacturing sector witnessed an accelerated growth since 1980, largely due to the lowering of government controls, increase in public infrastructure and a higher inflow of private investment in the sector (Anderson Business Consulting, 2003). By 2011-12, the country had nearly 1.76 lakh operational factories employing 13.4 million people, producing output worth nearly rupees 58 thousand billion in current prices (Government of India, 2012). At the same time, however, the manufacturing value added as a percentage of GDP was consistently lower than the corresponding global average (see Table 1). This moderate growth has been a characteristic feature of her manufacturing sector ever since independence, with its contribution hovering around 15% of the GDP throughout. If the sector realizes its full potential, this contribution could go up as high as 25 to 30% in another decade (Dhawan, Swaroop, & Zainulbhai, 2012).

While this estimate is impressive for the country as a whole, there is considerable disparity in this regard across her states. Only five states namely Tamil Nadu, Maharashtra, (the undivided) Andhra Pradesh, Gujarat, and Uttar Pradesh accounted for 59.4% of factories, 55.3% of employment and 50.9% of net value added in 2010. Presence of some of the India's best manufacturing hubs[1] in these states corroborates the above fact (Business Today, 2008). However, there exists considerable variation even among these states in various aspects. For instance, Maharashtra's net state domestic product (NSDP) was more than double the NSDP of (any of) the other four States in 2011; Uttar Pradesh is twice as populous as the others, and the literacy rate of these five states ranges between 67 to 82% (according to the latest Census of India, 2011). Needless to say, Indian states also differ considerably in the natures of the various amendments of Industrial Disputes Act as is done by the various State Governments from time to time. Besley and Burgess (2004) investigate whether the industrial relations climate in Indian states has affected the pattern of manufacturing growth during the period 1958-1992. They show that states which amended the Industrial Disputes Act in a pro-worker direction experienced lowered output, employment, investment, and productivity in registered manufacturing. In contrast, output in unregistered manufacturing increased. Regulating in a pro-worker direction was also associated with increases in urban poverty, which suggests that attempts to redress the balance of power between capital and labor can end up hurting the poor.

The objective of the present study is to extend the study of Besley and Burgess (2004) to evaluate the impact of labor regulation and various other factors on employment in the registered manufacturing sector in fourteen large Indian States. While the existing studies have focused on the first four decades since independence, we confine ourselves for the post-1980 era on account of the fact that although the process of liberalization of the Indian economy, in general and her industrial sector, in particular gathered momentum in 1991, it actually started in the early 1980s, under the Prime Ministerial regimes of Late Indira Gandhi and Late Rajiv Gandhi (DeLong, 2003). In other words, we consider the post-liberalization period in a broader sense. We hope to check the impact of labor regulation on employment in the semi-liberalized Indian economy since she is still in the process of liberalization and complete liberalization of her various sectors is yet to be reached.

The central piece of legislation under consideration here is the Industrial Disputes Act, 1947 pertaining to matters in the joint jurisdiction of the States and the Central Government[2]. By defining *legitimate* circumstances under which an employee may be retrenched, the Act *hinders* smooth functioning of the labor market. This intervention is of significance, as it worsens the ability of manufacturing units to effectively respond to market changes by reducing workers on their rolls. India's GDP growth touches as low as 3.24% in 2012-13 (according to the provisional figure for 2012-13 released by Central Statistical Organization (CSO)). A key recommendation, among many other significant policy changes being suggested to boost the growth, is to loosen the grip on the labor market by amending the Industrial Disputes Act. Pro-employer amendments may be helpful ensuring the manufacturing units to find it easier to *fire* employees, if market conditions desire so. This smoothening of the *hiring and firing* process is hoped to give a fillip to the stagnating growth of registered manufacturing sector. It is imperative that the effect of labor regulation on employment needs careful study in this context.

Labor markets are usually regulated at various levels and to the extent of various degrees as well in almost every country across the globe. Such intervention in its smooth functioning affects the instantaneous adjustment of the supply and demand for labor in an economy. Modern welfare states use to offer job protection to the workers, especially to those at the lower end of the pyramid. Effect of these constraints on growth, employment, and other macroeconomic variables has been a topic of intense theoretical and empirical debate.

Theoretical arguments take mainly two divergent stands, namely the *distortionist* and the *institutionalist* views (Jha & Golder, 2008). Proponents of the earlier view opine that any labor regulation would affect the smooth functioning and instantaneous adjustment mechanism of the labor market, thereby lowering rates of job creation and raise unemployment. Regulations are also likely to hinder the entire economy to perform smoothly, resulting in lower levels of growth and productivity and higher level of poverty. Ironically, therefore, labor market rigidities through various regulatory measures designed to protect the poor eventually end up hurting them (Besley & Burgess, 2004). Rather, free market ensures market to respond faster to any contemporaneous change in demand for and supply of labor by quickly reallocating them elsewhere. The process, therefore, is more likely to benefit labor by paying at least its marginal productivity without making them jobless. Actually, the neo-classical push to deregulate labor market emerged strongly during the 1980s when much of the developed world was reeling under the pressure of high unemployment. Evidence from the Organization of Economic Cooperation and Development (OECD) countries suggested that tighter regulations were a cause of concerns at that point of time. It was argued that to achieve full employment, workers must accept lower wages, stingier unemployment benefits and less secure jobs (Howell, 2005). However, the evidence for this orthodoxy is at best mixed, says Richard Freeman in his Foreword to the book. However, although such proposition is widely accepted, it is not unanimously appreciated (Nickell, Nunziata, & Ochel, 2005). The latter view opines that, in fact, there is a growing empirical literature that suggests otherwise (Oswald, 1997). They advocate that the labor market regulations and trade unions' bargaining power play an important role in protecting not only the vulnerable sections of the society, but benefit the economy as a whole as well. For instance, labor regulations might end up boosting productivity

[1] To be specific, some of these are Greater Noida (in Uttar Pradesh), Pune, Nasik and Aurangabad (in Maharashtra) and Sriperumbudur (in Tamil Nadu).

[2] The concurrent list (i.e., the List III) of Schedule IX of the Constitution of India contains 47 items of joint jurisdiction of the Central and State Governments. Legislation on Trade Union, Industrial and Labor Disputes can be carried out by both Central and State Governments.

Table 1
Manufacturing output as a percentage of GDP.

Year	India	China	EU	OECD	Pakistan	Sub-Saharan Africa	USA	World
1998	15.0	31.8	19.3	18.7	15.8	13.6	16.9	19.2
1999	14.6	31.6	18.7	18.4	15.5	13.0	16.7	19.0
2000	15.3	32.1	18.6	18.1	14.7	13.0	15.9	18.7
2001	14.6	31.6	18.1	17.2	15.5	13.2	14.6	17.9
2002	14.9	31.4	17.5	16.8	15.5	13.1	14.4	17.6
2003	14.9	32.8	17.0	16.4	16.0	13.1	14.0	17.4
2004	15.3	32.4	16.8	16.5	17.2	12.9	14.3	17.5
2005	15.4	32.5	16.5	16.3	18.6	12.4	14.2	17.3
2006	16.1	32.9	16.4	16.1	13.8	11.9	13.9	17.1
2007	16.0	32.9	16.4	16.1	14.0	11.7	13.8	17.1
2008	15.4	32.7	15.7	15.4	15.2	11.5	12.9	16.5
2009	15.1	32.3	14.3	14.4	13.4	10.9	12.4	15.6
2010	14.8	32.5	15.1	15.1	13.6	10.9	12.6	16.2
2011	14.7	31.8	15.1	15.1	14.3	10.3	12.9	16.1

Source: The World Bank.

by making job-training mandatory, which has an obvious favorable bearing on overall growth and prosperity of a country.

Several cross-country studies lend credence to both pro- and anti-regulation arguments. In other words, empirical evidence across the world is equivocal in nature. Let us, first of all, review some important studies in favor of the anti-regulation arguments. A precursor to these studies is the influential OECD Jobs Study (OECD, 1994). In this connection we would also like to mention some of its significant policy recommendations, which include complete or partial elimination of minimum wages, shifting from (direct) labor income tax to (indirect) consumption tax, easing restrictions on employee layoffs, reforms to unemployment benefits, etc. These seem to be supported by empirical evidence from both the developing as well as the developed countries across the globe. Botero, Djankov, La Porta, López-de-Silanes and Shleifer (2004) examine the regulation of labor markets through employment, collective relations, and social security laws in 85 countries. The study extensively collates data on the legal frameworks prevail in these countries and creates *indices* to measure the strength of regulation. Their findings suggest that political power of the left is associated with more stringent labor regulations and more generous social security systems, and that socialist, French and Scandinavian legal origin countries have sharply higher levels of labor regulation than that in other common law countries. They conclude that increasing regulation of labor can lead to a larger unofficial economy, lower labor force participation and higher unemployment, especially among the youths. Using data panel on 76 countries during 1970 through 2000, Calderón and Chong (2005) also show that stricter labor laws adversely affect the growth of both industrial and developing countries. Institutionally fixed minimum wages and trade union activities are two important factors to adversely affecting growth and its slowing down is due to sluggish wage adjustments and reallocation of labor arisen therefrom. Heckman and Pagés (2004) studied the impact of labor regulation on employment and growth in the Latin American countries. The study concludes that labor market interventions by the State affect the youth, marginal workers and unskilled workers the most. While social security benefits (unemployment benefits in this case) reduce employment, job security regulations affect the distribution of employment. In fact, the regulations provide a sense of security for the *insiders* (i.e., who are already in job) at the cost of loss incurred by the *outsiders* (i.e., who are looking for it) due to rigidities in the labor market.

On the other hand, there is a significant and growing body of studies that present a different picture altogether. The study of Baker, Glyn, Howell and Schmitt (2005) on 20 OECD countries refutes the orthodox conclusions of the above studies. Using a modified and improved dataset with interactions between institutions, they show that there is no statistically significant relationship between labor market regulations (in the form of taxation, unemployment benefits, legal institutions, etc.) and unemployment. Dutta Roy (2004) investigates the extent of impact of job security legislation through an analysis of dynamic interrelated factor demand function, including that for the factor *labor*, for the Indian industries. His findings suggest that although there is evidence for some impact of job security legislation on employment adjustment, however, contrary to the popular belief, extent of such impact is minimal. Although the study of Nataraj, Pérez-Arce, Kumar and Srinivasan (2013) using a meta-analysis on low income countries shows a negative effect of regulations on formal sector employment, it has a compensating positive effect on that in the informal sector, thereby concluding for an ambiguous effect on overall employment. Leximetric[3] study by Deakin and Sarkar (2011) to see the impact of Indian Labor Laws on unemployment for the period of 1970 through 2006 does not find any evidence to support the view that pro-worker labor regulation leads to unemployment or industrial stagnation. Rather, contrary to the conventional wisdom, they observe that the pro-worker labor laws are associated with low unemployment with the direction of causality being the other way, i.e., it runs from unemployment and output to labor regulations.

The paper unfolds as follows. Section 2 discusses few stylized facts on manufacturing sector in India. Analytical methodology, data set and the variables chosen for our analyses are presented in Section 3. Section 4 presents the results obtained and Section 5 concludes. Appendix highlights on limitation(s) of the study and states on future scope of research in this connection. It throws some light as well in details on formation of variables from the available information.

2. Manufacturing sector in India

Manufacturing sector in India covers all manufacturing, processing and repair and maintenance services units. India's manufacturing sector may be classified under two broader groups, namely registered (or organized) and unregistered (or unorganized). Information on the earlier is collected and published by CSO through its Annual Survey of Industries (ASI), while that on the latter is by National Sample Survey Organisation (NSSO) through its various rounds of surveys. The registered manufacturing sector includes two types of factories–those employing 10 or more workers and using power and those employing 20 or more

[3] Leximetrics is a field which attempts to rank the strengths or weaknesses of laws, by assigning a numerical value to each type of law in a particular context. Such assigned numerical figures are then used to compare the efficacy of different legal systems and to see how these numbers are correlated with economic growth or employment related goals.

workers without using power on any day of the preceding 12 months. All the remaining manufacturing units come under the umbrella of unregistered manufacturing.

The contribution of (both registered and unregistered) manufacturing sector in India to her GDP is shown in Table 2. One important feature here is that although the contribution of overall manufacturing to GDP witnesses a negligible increase and remains almost stagnant (around 15%) during these three decades[4], that from registered manufacturing shows an increasing trend throughout. We would like to mention in this connection that the number of factories in Indian manufacturing sector and workers employed therein have both increased by 64% and 49% respectively during the post-1981 thirty years period, however, registered manufacturing employment did not increase that much[5]. Average real wage (at 1981 prices) per worker has also gone up by more than 28%, from Rs.6235 to Rs.8002 per annum. In fact, most of the Indian States experience increases in the number of factories, workers and real wage during this period, with an exception for West Bengal where both the number of industrial workers as well as their average real wage has gone down. However, extent of such changes varies significantly from one State to another. To be specific, while Rajasthan, Tamil Nadu, Punjab, Haryana, and Himachal Pradesh experience more than doubled the number of industrial workers during this period, West Bengal and Bihar witnessed decrease in the corresponding number of employees[6]. Himachal Pradesh also witnesses the highest increase in real wage (of 89%) during this period, while (un-divided) Andhra Pradesh comes next (with 74%).

3. Analytical methodology, variables and data

As we have already mentioned, we largely follow (a modified version of) the Besley and Burgess (2004) methodology to analyse our data base of 1981-2011 to see the effect of labor regulation on employment in the registered manufacturing sector in India. Being a federal democratic system having two tiers of governments, viz., a Union Government at the Centre and several State Governments, Laws in India can be formed as well as amended at both the levels. There is a clear-cut guideline in the Constitution of India separately listing the subject matters on which each house can legislate upon. *Industrial Disputes* comes under the joint jurisdiction of both the Central and State Governments. To be specific, it is placed under the *concurrent list* of the Constitution. This allows the State Governments to bring in appropriate modifications even to (some of) the Central Laws to meet local challenges, considering the specific nature of local conditions in the backdrop. Industrial Dispute Act, 1947 is one such of them. Nevertheless, in case of any conflict between the Central and State legislations, the Central Law shall prevail.

This study hypothesizes that the amendments to the Industrial Disputes Act, 1947 is an important determinant of employment in the registered manufacturing sector. Each amendment at the State level is analyzed and eventually coded under three labels—*pro-employee*, *pro-employer*, or *neutral*. For the ease in quantitative analysis, they were noted as +1 (for pro-employee),–1 (for pro-employer), and 0 (for neutral). However, if there is more than one amendment in a year, such year(s) is noted as +1,–1, or 0 based on the overall direction of the changes. For an illustration, consider the following amendment made by the Gujarat Legislative as an exception from the definition of retrenchment. "*Termination of service of a workman in an industrial establishment situated in the Special Economic Zone (SEZ) declared as such by the Government of India*" (Malik, 2013). This amendment clearly allows industries in the SEZs in Gujarat to freely retrench workers. It is, therefore, coded as–1 and placed under the *pro-employer* category. A detailed exposition of all such amendments made by different Indian states during our study period, along with their assigned codes, is shown in the Appendix[7]. In doing so, we largely depend on Malik (2013) for the details of such amendments enacted in different Indian States from time to time.

We use (logarithmic value of) employment in registered manufacturing sector as the dependent variable in our analysis. To explain it, we use a set of explanatory variables, which include (logarithmic value of) total number of workers in the respective states, as a control variable[8]. Although Besley and Burgess (2004) use total population of a State as a control variable, we use *total work force* for it to adjust for the differences in availability of *employable population* across the States considered. The other explanatory variables are assigned code for the amendment in the Industrial Dispute Act, 1947 made by the concerned States (with four years lag[9]), (logarithmic value of) real earning per worker, (logarithmic value of) per capita real developmental revenue expenditure (with no lag, a period lag and two periods lag, as indicated in footnote #9), (logarithmic value of) per capita real developmental capital expenditure (with no lag, a period lag and two periods lag), (logarithmic value of) per capita electricity generation capacity and (logarithmic value of) real per capita net state domestic product. The abbreviation of these variables and their definition are as follows:

Emp: (logarithmic value of) employment/rate[10] of employment in registered manufacturing sector.

Amend: assigned code to the respective amendments.

Earn: (logarithmic value of) real earning per worker in rupees (at 1981 prices).

DRExp: (logarithmic value of) real per capita developmental revenue expenditure in rupees (at 1981 prices).

DCExp: (logarithmic value of) real per capita developmental capital expenditure in rupees (at 1981 prices).

Elec: (logarithmic value of) per capita electricity generation capacity (in kilo-Watt).

NSDP: (logarithmic value of) real per capita net state domestic product in rupees lakh (at 1981 prices).

[4] However, this share increases further to 16.1% in 2009-10 (Trivedi et al., 2011).

[5] It is argued in a recent Press Release that . . .*employment generation in registered manufacturing sector soared 28.5% during 11th plan* (ASSOCHAM, March 14, 2014).

[6] It is to be noted in this connection that *worker* and *employee* refer to two different concepts in ASI database, with their distinct respective meanings. However, we use both of them interchangeably, to refer *workers* only.

[7] To provide a brief overview here in this context, we confine ourselves to fourteen large Indian States, namely Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. Since the three young States, viz., Chhattisgarh, Uttaranchal and Jharkhand were carved out of Madhya Pradesh, Uttar Pradesh and Bihar respectively, for ease of analysis, in general and to make the data points pertaining to them comparable over time, in particular, these have been merged with their parent States. In fact, only ten of them made amendments in either direction during the period of our concern. Each amendment from each State has been coded appropriately and details of it are shown in the Appendix.

[8] Alternatively, we also use (logarithmic value of) employment **rate** in registered manufacturing sector as dependent variable. In such case, we do not use this control variable for obvious reason.

[9] We use lag value of those variables which conceptually thought of taking some time to cast its effect on the dependent variable we have considered. We have tried with different lags, for instance with one year lag, two year lag and so on. We observe *amendment* to be significant (in some cases) with a lag of four years only. Hence, we take this variable with four years lag and write our population regression equation accordingly. Again, for each of per capita developmental capital expenditure and per capita developmental revenue expenditure we have taken three alternative possibilities, i.e., with no lag, one year lag and two years lag. However, we heuristically take such lag to be just one year for the per capita electricity generation capacity variable.

[10] Kindly refer to footnote #8 for more clarification in this regard.

Table 2
India's manufacturing sector GDP.

Period	Manufacturing GDP	Registered manufacturing GDP	Unregistered manufacturing GDP
1980-85	101412 (14.3)	55571 (7.8)	45841 (6.5)
1985-90	133812 (14.7)	79756 (8.7)	54056 (6.0)
1990-95	171233 (14.6)	109247 (9.3)	61987 (5.3)
1995-2000	248504 (15.7)	162847 (10.3)	85657 (5.4)
2000-05	316307 (15.1)	212370 (10.1)	103938 (5.0)
2001-06	338105 (15.0)	228619 (10.2)	109486 (4.9)
2002-07	367898 (15.1)	249583 (10.3)	118315 (4.9)

Figure in parenthesis represents percentage of overall GDP.
Absolute figure is average (in rupees crore at 1999-2000 prices) during the period.
Source: Trivedi et al., 2011.

Worker[11]: (logarithmic value of) total workforce in the State

Therefore, we have conceptualized the population regression equation to be as follows:

$$Emp_{st} = \alpha_s + \gamma_t + \beta_1 Amend_{st-4} + \beta_2 Earn_{st} + \beta_3 DRExp_{st-j} + \beta_4 DCExp_{st-i} \beta_5 Elec_{st-1} + \beta_6 NSDP_{st} + \beta_7 Worker_{st} + \varepsilon_{st}$$

where subscripts *s* and *t* stand for concerned State and time respectively. Again, as already indicated in footnote #9, each of *i* and *j* can take values 0, 1 or 2 in the subscript of the explanatory variable *DCExp* and *DRExp* respectively. An exposition of some descriptive statistics of the variables we have considered is shown in Table 3.

With regard to the expected sign of the (coefficients of) explanatory variables, *Worker* is supposed to have a positive effect on manufacturing employment since it acts as an indicator of availability of employable workforce in the respective state, with *Amend* may have either of the possible signs, depending upon which of the two views, viz., *institutionalist* and *distortionist* is actually in force in India, as discussed earlier. Since pro-employee amendment is assigned a positive value, a negative sign of this variable corroborates the *distortionist* view and vice versa. In other words, potential entrepreneurs will be attracted to invest more once labor law(s) is amended to make it more employer-friendly, thereby increasing industrial employment and vice versa. In fact, code assigned for the change in *labor regulation* (i.e., amendment to the Industrial Disputes Act, 1947 enacted by each of the 14 States), ten States had amendments in either of the directions at least for one year, while the remaining four States[12] remained neutral. *Real earning per worker* is assumed to be a critical factor which is expected to have a negative effect on employment rate. To be specific, industries may shift to more capital intensive production techniques when formal sector wage increases to substitute dearer input *labor* by the relatively cheaper input *capital*. Moreover, industries may also look for leasing out some of their ancillary activities through *sub-contracting* which are otherwise produced in-house. In that case, informal sector employment is supposed to increase at the cost of that in the formal sector. To mention here, near stagnation in growth of real wages over the last three decades is a worrying factor for Indian industries. More recently, real wages have started to contract as well. To be specific, West Bengal witnessed a decline in real wages from 1981 levels. In fact, remuneration of support/managerial staff has been growing consistently since the 1990s, leaving the real wage of workers nearly constant or declining. This has resulted in a shift in preference with young graduates opting for managerial roles within manufacturing units (Trivedi et al., 2011). In view of the facts that the developmental *revenue* expenditure is supposed to improve overall developmental status of any state, in general and developmental *capital* expenditure helps improving overall infrastructural facilities available there, in particular, each of these variables is expected to have a positive effect in increasing formal sector manufacturing employment as well. Although such positive effect of developmental *capital* expenditure on formal sector employment is unambiguous, if developmental *revenue* expenditure is financed at the cost of reducing developmental *capital* expenditure, the earlier may even have a negative effect on employment, of course, through the latter! *Per capita installed capacity of electricity generation* is considered as a proxy for the availability of infrastructure favorable for industrialization in the concerned State. In other words, we hypothesize that increase in availability of electricity (which is considered to be one of the essential inputs for any modern industrial activity) would attract more entrepreneurs to establish new factories thereby resulting in an increase in industrial employment[13]. In view of the fact that an increasing real per capita net state domestic product scenario is indicative of the prosperity of the state concerned, it is also supposed to have a positive effect on overall employment figures of the state, in general and that for the manufacturing sector as well. Table 4 throws some light on their expected sign, citing the similar study from the literature. It also shows our findings in this regard.

4. Econometric analyses and results

We have applied pooled ordinary least squares (OLS), fixed effect (FE) as well as random effect (RE) regression models of panel data. Results of these analyses are demonstrated in Tables 5, 6 and 7. As is observed from the theoretical structure of our population regression equation shown above, since we have allowed both state as well as time specific fixed effects, if any, there may be the case that the data is cross section wise hetero-scedastic as well as time series wise auto-correlated. To accommodate such possible effect(s) into our estimation results, we also use Parks (1967) method, results of which are shown in Table 8.

Since the assigned code (to the corresponding amendment(s) to the Industrial Dispute Act, 1947 enacted by respective State) is positive when it is pro-employee, positive and significant (although only at 10% level) value of its estimated coefficient clearly

[11] We have used total work force in a state as a control variable to explain employment of that state. However, as is already noted in the footnote #8, one ought not to use such control variable while s/he explains employment rate, instead of employment itself. We have estimated both the equations, one using (logarithmic value of) employment and the other with that of employment rate as the dependent variable. In view of the fact that the basic results of these two alternatives are largely of same kind, we report either of the two for different cases for which it shows even slightly better! However, the other set of results can be made readily available on demand, if any.

[12] To be specific, Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu and West Bengal make some amendments in the Industrial Dispute Act, 1947 in either of the directions during our study period, while Bihar, Kerala, Uttar Pradesh and Haryana remain neutral in this regard.

[13] In fact, each of the selected State has been able to (at least) double its capacity over the last three decades, with Uttar Pradesh being an exception in this regard. And, Himachal Pradesh and Rajasthan recorded the highest increase to make it (almost) 7 and 5.5 times respectively.

Table 3
Descriptive statistics of the variables considered.

Variable	Average	Standard deviation	Minimum	Maximum
Assigned code to the amendment(s)	0.022	0.204	1	−1
Earnings per worker (in Rs.) (at 1981 prices)	8330	2270	3250	18200
Developmental revenue expenditure per capita (in Rs.)	110	37	45	241
Developmental capital expenditure per capita (in Rs.)	5.6	12.6	0.027	119
Per capita electricity generation capacity (in kilo-watt)	0.076	0.042	0.013	0.192
Per capita net state domestic product (in Rs. million) (at 1981 prices)	167300	133500	31452	996300
Number of workers	453022	277856	89349	1542000
Employment rate (in %)	2.1	1.1	0.4	4.8

Source: Authors' own compilation.

Table 4
Suggested sign in the literature vis-à-vis our findings on the explanatory variables.

Explained variable: employment in the registered manufacturing sector			
Explanatory variable	Suggested sign	Supporting literature	Our findings
Assigned code to the amendment(s)	Negative	Besley and Burgess (2004)	Positive
Earnings per worker	Negative	Dutta Roy (2004)	Negative
Developmental revenue expenditure	Positive	Besley and Burgess (2004)	Ambiguous
Developmental capital expenditure	Positive	Besley and Burgess (2004)	Positive
Per capita electricity generation capacity	Positive	Besley and Burgess (2004)	Positive
Net state domestic product	Positive	Besley and Burgess (2004)	Positive
Number of workers	Positive	Besley and Burgess (2004)	Positive

Source: Authors' survey of the literature.

Table 5
Pooled OLS regression result.

	Dependent variable					
Explanatory variable	ln employment			ln employment rate		
Amend	0.066	0.082*	0.075*	0.066	0.078*	0.075*
(with 4 years lag)	(0.043)	(0.043)	(0.043)	(0.045)	(0.045)	(0.044)
Earn	0.036	0.075	0.002	0.019	0.032	−0.018
	(0.113)	(0.112)	(0.113)	(0.116)	(0.116)	(0.116)
DRExp	0.216*			0.149		
	(0.114)			(0.117)		
DRExp		−0.306***			−0.082	
(with 1 year lag)		(0.117)			(0.112)	
DRExp			−0.198*			−0.228**
(with 2 years lag)			(0.106)			(0.109)
DCExp	0.003			0.005		
	(0.009)			(0.009)		
DCExp		−0.013			−0.013	
(with 1 year lag)		(0.008)			(0.009)	
DCExp			−0.015*			−0.015*
(with 2 year lag)			(0.008)			(0.008)
Elec	0.168**	0.171**	0.165**	0.206***	0.215***	0.197***
(with 1 year lag)	(0.071)	(0.070)	(0.071)	(0.073)	(0.072)	(0.072)
Worker	−0.121	−0.353	−0.025			
	(0.263)	(0.281)	(0.259)			
NSDP	0.262**	0.263**	0.289***	0.417***	0.432***	0.414***
	(0.106)	(0.102)	(0.101)	(0.103)	(0.100)	(0.100)
Constant	18.29***	18.16***	13.51***	1.313	−0.332	−1.912
	(4.112)	(3.978)	(4.091)	(1.059)	(1.100)	(1.263)
No. of observations	318	318	319@	318	318	319
R-squared	0.959	0.959	0.959	0.942	0.942	0.943
State-specific fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year-specific fixed effect	Yes	Yes	Yes	Yes	Yes	Yes

Approximated up to three decimal points.
Figure in parenthesis is the respective standard error.
***, ** and * indicate that the p value to be respectively less than 1%, 5% and 10%.
@: There may be a slight mismatch in number of observations across alternatively estimated equations in each of the subsequent Tables as well, since DRExp value is missing for Uttar Pradesh in 1996.
Source: Authors' own estimation.

Table 6
Fixed effect panel data regression result.

Explanatory variable	Dependent variable ln employment rate					
Amend	0.045	0.110	0.053	0.045	0.110	0.053
(with 4 years lag)	(0.081)	(0.075)	(0.081)	(0.081)	(0.075)	(0.081)
Earn	−0.729***	−1.023***	−0.874***	−0.729***	−1.023***	−0.874***
	(0.087)	(0.075)	(0.080)	(0.087)	(0.075)	(0.080)
DRExp	0.444***			0.444*		
	(0.093)			(0.093)		
DRExp		−0.559***			−0.559***	
(with 1 year lag)		(0.077)			(0.077)	
DRExp			0.248***			0.248***
(with 2 years lag)			(0.060)			(0.060)
DCExp	−0.013			−0.013		
	(0.014)			(0.014)		
DCExp		−0.039***			−0.039***	
(with 1 year lag)		(0.013)			(0.013)	
DCExp			0.009			0.009
(with 2 year lag)			(0.014)			(0.014)
Elec	0.015	0.176***	−0.014	0.015	0.176***	−0.014
(with 1 year lag)	(0.069)	(0.065)	(0.068)	(0.069)	(0.065)	(0.068)
NSDP	1.068***	0.855***	1.273***	1.068***	0.855	1.273
	(0.102)	(0.098)	(0.088)	(0.102)	(0.098)	(0.088)
Constant	1.088	−6.009***	0.101	1.088	−6.009***	0.101
	(0.719)	(0.729)	(0.594)	(0.719)	(0.729)	(0.594)
No. of Observations	318	318	319	318	318	319
R-squared	0.793	0.825	0.791	0.793	0.825	0.791
State-specific fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year-specific fixed effect	No	No	No	Yes	Yes	Yes

Approximated up to three decimal points.
Figure in parenthesis is the respective standard error.
*** indicates that the p value to be less than 1%.
Source: Authors' own estimation.

Table 7
Random effect panel data regression result.

Explanatory variable	Dependent variable ln employment rate					
Amend	0.058	0.074	0.072	0.066	0.078*	0.075*
(with 4 years lag)	(0.048)	(0.047)	(0.045)	(0.045)	(0.045)	(0.044)
Earn	−0.124	−0.027	−0.079	0.019	0.032	−0.018
	(0.105)	(0.105)	(0.099)	(0.116)	(0.116)	(0.116)
DRExp	−0.279**			0.149		
	(0.109)			(0.117)		
DRExp		−0.559***			−0.082	
(with 1 year lag)		(0.085)			(0.112)	
DRExp			−0.559***			−0.228**
(with 2 years lag)			(0.085)			(0.109)
DCExp	0.015*			0.005		
	(0.009)			(0.009)		
DCExp		−0.002			−0.013	
(with 1 year lag)		(0.009)			(0.009)	
DCExp			−0.006			−0.015*
(with 2 year lag)			(0.008)			(0.008)
Elec	0.194**	0.201***	0.167**	0.206***	0.215***	0.197***
(with 1 year lag)	(0.076)	(0.074)	(0.072)	(0.073)	(0.072)	(0.072)
NSDP	0.086	0.141*	0.179**	0.417***	0.432***	0.414***
	(0.089)	(0.080)	(0.077)	(0.103)	(0.100)	(0.099)
Constant	−3.479***	−4.554***	−5.726***	1.313	−0.332	−1.912
	(0.805)	(0.757)	(0.799)	(1.059)	(1.100)	(1.263)
No. of observations	318	318	319	318	318	319
R-squared (overall)	0.896	0.903	0.907	0.942	0.942	0.943
State-specific fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year-specific fixed effect	No	No	No	Yes	Yes	Yes

Approximated up to three decimal points.
Figure in parenthesis is the respective standard error.
***, ** and * indicate that the p value to be respectively less than 1%, 5% and 10%.
Source: Authors' own estimation.

Table 8
Regression results following Parks' (1967) Method.

Dependent variable	ln employment					
Explanatory variables	With Constant	Without Constant	With Constant	Without Constant	With Constant	Without Constant
Amend (with 4 years lag)	0.025	0.070	−0.014	0.059	0.097	0.116
	(0.091)	(0.100)	(0.097)	(0.106)	(0.094)	(0.103)
Earn	−0.262***	−0.680***	−0.262***	−0.677***	−0.254***	−0.688***
	(0.080)	(0.069)	(0.081)	(0.069)	(0.079)	(0.069)
DRExp	0.193*	0.337***				
	(0.107)	(0.101)				
DRExp (with 1 year lag)			0.177*	−0.325***		
			(0.107)	(0.102)		
DRExp (with 2 years lag)					0.221**	−0.305***
					(0.104)	(0.102)
DCExp	0.021	0.042***				
	(0.015)	(0.015)				
DCExp (with 1 year lag)			0.021	0.044***		
			(0.015)	(0.015)		
DCExp (with 2 years lag)					0.037**	0.033***
					(0.015)	(0.002)
Elec (with 1 year lag)	0.616***	0.359***	0.603***	0.348***	0.633***	0.360***
	(0.066)	(0.065)	(0.067)	(0.065)	(0.066)	(0.065)
NSDP	0.131	0.510***	0.152	0.524***	0.106	0.494***
	(0.096)	(0.086)	(0.095)	(0.086)	(0.093)	(0.087)
Workers	0.742***	0.861***	0.739***	0.865***	0.730***	0.865***
	(0.038)	(0.039)	(0.038)	(0.039)	(0.038)	(0.038)
Constant	7.471***		7.378***		7.753***	
	(0.927)		(0.938)		(0.913)	
Observations	338	338	325	325	312	312
R-squared	0.991	0.999	0.991	0.999	0.992	0.999
No. of States	13#	13	13	13	13	13

Approximated up to three decimal points.
Figure in parenthesis is the respective standard error.
***, ** and * indicate that the p value to be respectively less than 1%, 5% and 10%;
#: We do not consider Uttar Pradesh for some missing value, to make our data a balanced panel.
Source: Authors' own estimation.

corroborates *institutionalist* view that the level of (formal sector) manufacturing employment increases with an employee-friendly amendment to the Act. However, we have obtained such result only for few cases in both the pooled OLS as well as the RE models. Again, since it becomes significant only when we consider it with four years lag, amendment in labor laws/regulations takes on an average four years to cast its inducing effect on formal sector manufacturing industrial employment generation!

In an increasingly liberalized economy, labor laws may act as an important tool to generate employment. Given this backdrop, our result in this regard has significant implication for two reasons: (a) according to Deakin and Sarkar (2011), pro-worker labor laws are associated with low unemployment, with the direction of causality running from unemployment and output to labor regulation; and (b) it opposes the conventional wisdom favouring relaxation of regulations on the labor market to increase the welfare of workers through more employment generation. Although we have not studied the existence of any possible causal direction in this regard, our findings corroborate those by Deakin and Sarkar (2011). However, since we observe such result only in few cases of the alternatives we have considered and even those at 10% level of significance, it could, therefore, pose an alarming lesson to India's political leadership where loss of sizable amount of work-hours due to labor unrest and related extremist activities from the labor union(s) is almost a routine phenomenon throughout the country, in general and that in her few States like West Bengal[14], in particular that pro-employee amendment in labor laws could make employees happy in the short run, however, that may seem to be an illusion and this vulnerable section of the society (i.e., the working class) may have to ultimately pay its price through their job-loss. Alternatively, if sufficient flexibility to the entrepreneur is offered in their decision to employ workers as per their own *rational* requirement, backed by the peaceful law-and-order situation maintained by the concerned administrative authorities, might ultimately become sustainably beneficial to the working class. Government can rationally interfere into it and that even only whenever it is required and to the minimal possible extent, too! However, at this stage it could at best be a hypothesis and nothing concrete could be said without further rigorous analysis in this direction, at least for India!

As for the other explanatory variables are concerned, *real wage per worker* has a significant inverse effect on employment in all the cases under the FE and Parks (1967) model, thereby corroborating the Besley-Burgess assertion that industries may shift to more capital intensive production techniques when formal sector wage increases to substitute dearer *labor* input by the relatively cheaper *capital* input. Industries may even go looking for leasing out some of their ancillary activities through *sub-contracting* which are otherwise produced in-house. *Work force*, a control variable in our analysis, has a significant direct effect on employment for all the cases wherever it becomes significant as an explanatory variable. To

[14] One can recall the ultimate consequence of the destructive political agitation by the All India Trinamool Congress Party against the Tata Motor's then proposed NANO project at Singur in West Bengal in this regard and may have a comparison between the overall socio-economic impact on the local livelihood thereafter at Singur (from where the Tata Motor had to shift their factory) and at Sanand in Gujarat (where ultimately they re-settled their NANO factory).

Table 9
Correlation coefficient between developmental revenue expenditure and developmental capital expenditure during the study period.

State	Correlation coefficient (in %)		State	Correlation coefficient (in %)	
	Per capita values	Total values		Per capita values	Total values
Andhra Pradesh	−23.8	−27.0	Orissa	−24.2	−12.4
Bihar	−28.9	−27.6	Punjab	−8.0	4.2
Gujarat	−25.5	−28.3	Rajasthan	−4.7	12.3
Haryana	−25.8	−24.4	Tamil Nadu	−3.7	6.9
Karnataka	−17.3	−15.8	Uttar Pradesh	−0.5	10.5
Kerala	−18.8	−15.7	West Bengal	−33.5	−35.0
Madhya Pradesh	−19.8	−12.2	All India	−6.1	−4.6
Maharashtra	−24.7	−15.9			

Approximated up to one decimal point.
Source: Authors' own compilation.

be specific, for our regression equations to explain actual level of employment, rather than rate of employment, we have observed that the *work force* variable has a significant positive impact on the explained variable. As is already mentioned, we have tested the possible effect of *DCExp* on employment for three alternative cases, i.e., at the level of the variable, with its one year lag value and with its two years lag value and observed it to have a positive effect on the dependent variable for some of these three cases, however, for the two periods lag the model fits the best! Although we observe some exceptions in this regard in some other models, in view of the fact that the Parks (1967) model is supposed to provide the most robust result, we draw such conclusion on the basis of the results so obtained. This indicates that (a) more and more public sector capital expenditure for development purpose is one important favourable factor in job creation, possibly through improvement in overall infrastructural condition to make investment climate more attractive to the potential entrepreneurs; and (b) public sector capital expenditure for development purpose understandably requires some time to be realized practically. On the other hand, however, *DRExp* is observed to have an ambiguous effect on employment. To be specific, its estimated coefficient has been observed to be positive and significant for some cases while that is negative and significant for the others, thereby pointing to the fact that although there may be a positive impact of this variable in improving employment scenario through overall improvement in human capital development to make workers better employable, it may sometimes be so counterproductive that even reduces employment opportunity, possibly because of the fact that such revenue expenditure is financed compromising corresponding capital expenditure, through possible negative effect on infrastructure. This assertion is clearly supported by correlation structure between these two variables (as shown in the Table 9) which is negative for all the States considered for our study (at the per capita level) and also is negative for overwhelming majority of the States (at the overall level) as well as for the country as a whole.

Installed capacity of electricity generation variable shows a significant positive effect throughout on employment generation. This corroborates Besley-Burgess assertion that the availability of more electricity would induce modern entrepreneur to invest more since almost all sort of industrial activities nowadays heavily rely upon power supply. Of course, an alternative possibility may also be there that increase in availability of electricity may induce the entrepreneurs to replace labor by more and more advanced automated machineries, in general and for the situation when real wage rate is fast increasing, in particular, which couldn't otherwise be installed at all if power shortage is in place. This is also proposed in the literature that the increasing mechanization of the Indian manufacturing sector actually replaced labor during the 1980s and 1990s (Anderson Business Consulting, 2003). Our finding in this regard, however, does not support this view. Real per capita *NSDP* has also significant positive effect on employment generation for most of the cases, with exceptions only for 25% of the cases (i.e., six out of total twenty four alternatives).

5. Concluding remarks

There are two divergent stands on the relation between labor regulation and employment, namely the *distortionist* and the *institutionalist* views. Proponents of the earlier view opine that labor regulation would affect the smooth functioning and instantaneous adjustment mechanism of the labor market, thereby lowering rates of job creation and raise unemployment. It also likely to hinder the entire economy to perform smoothly, resulting in lower levels of growth and productivity and higher level of poverty. Therefore, labor market rigidities through various regulatory measures designed to protect the poor eventually end up hurting them! However, although such proposition is widely accepted, it is not unanimously appreciated in the literature. The latter view opines that, and in fact, there is a growing empirical literature that suggests otherwise. They advocate that the labor market regulations and trade unions' bargaining power play an important role in protecting not only the vulnerable sections of the society, but benefit the economy as a whole as well. For instance, labor regulations might end up boosting productivity by making job-training mandatory, which has an obvious favorable bearing on overall growth and prosperity of a country.

We have investigated into this debate to see which of these two alternative views actually valid for the post-liberalized Indian economy, following the study of Besley and Burgess (2004), the pioneering work in this regard in India. However, while the Besley and Burgess (2004) study was for 1954-1992, we confine ourselves for the three-decade period since 1981, which can be better characterized as a period of gradual and steady withdrawal of the State controls from various aspects of the economy. Our empirical findings corroborate, although not very strongly, the *institutionalist* view, i.e., pro-worker labor regulation actually induces employment. Among the other factors, we observe that there is significant negative effect of *real wage rate* on formal sector manufacturing employment whereas each of the variables like *workforce* (as a control variable while we consider employment as our dependent variable), *per capita real developmental capital expenditure*, *per capita electricity generation capacity* of the respective State and *real per capita net state domestic product* has significant positive effect on employment. However, effect of *per capita real developmental revenue expenditure* seems to have an ambiguous effect in this regard, thereby indicating absence of any conclusive impact of this variable towards job creation whether improving overall human capital to make people better employable or whether such

expenditure is actually financed through compromising associated capital expenditure for overall infrastructural improvement thereby fails to attract more and more entrepreneur to invest! Correlation structure between these two variables, however, clearly supports the latter.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.jefas.2016.06.002.

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