Abstract

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Do Labour Reforms Boost Entry of New Small and Medium Industrial Enterprises? Evidence from India

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Abstract
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Keywords: Small and medium enterprises, new firm entry, labour reforms, power availability, Indian manufacturing

JEL codes: J08, L25, L26, L60
Do Labour Reforms Boost Entry of New Small and Medium Industrial Enterprises? Evidence from India

Introduction

There is a vast amount of literature bringing out that labour regulations in emerging economies adversely affect the performance of industrial enterprises, and more generally, labour regulations tend to reduce growth and job creation in such economies (see, e.g., Calderon and Chong, 2005; Basu, 2005; Jha and Golder, 2008). Several studies have found that labour regulations negatively impact business entrepreneurship and the rate of firm entry (see, e.g., Freeman, 1988; Nickell and Layard, 2000; Botero et al., 2004; Klapper et al., 2004). How labour market rigidities have distressed the performance of Indian manufacturing has been studied and brought out by Besley and Burgess (2004) and Gupta et al. (2007), among others. Other studies dealing with the link between labour regulations and job creation in industries in India include Goldar and Ghosh (2016) and Soft et al. (2022).

This paper asks: Does easing labour regulations boost the pace of setting up new small and medium industrial enterprises in an emerging economy? This is an under-researched area, and there is hardly any study on the impact of labour regulations on the entry rate of new small and medium enterprises (SMEs) in manufacturing. The issue is examined here using manufacturing sector data for India.

Somewhat similar previous research that we could find is by Kannan (2014), who dealt with the impact of labour laws in India on the growth of micro and small enterprises. Another study that bears some similarities to the present one is Chaudhuri et al. (2006), who investigated the factors governing the growth in the number of industrial enterprises in India. They observe that rigid labour laws and trade unions pose significant barriers to exit and restructuring, and thus discourage the entry of new firms. They find evidence of an adverse effect of unions on the growth of the number of industrial enterprises in India.

While the present study belongs first and foremost to the strand of literature on the effect of labour regulations on firm performance, it has an overlap with the strand of literature that deals with locational choices of firms, the rate of entry of firms in different regions, and factoring underlying regional concentration of industries (see, for example, Fernandes and Sharma, 2012). Infrastructure has often been found to be an important determinant of the pace
of regional industrialization. This aspect receives attention in the present study, particularly the power availability.

Before proceeding, a brief discussion is needed on labour reforms undertaken by Indian states since the mid-2010s. In 2014, the state of Rajasthan in India undertook substantial labour reforms. The steps taken included (i) raising the threshold of applicability of Chapter V-B of the Industrial Disputes Act (abbreviated hereafter as IDA) from 100 to 300 workers and (ii) raising the applicability limit of the Contract Labour (Regulation and Abolition) Act (abbreviated hereafter as CLA), 1970, from 20 to 50 workers. Chapter V-B of the IDA is often considered a significant obstacle to labour market flexibility in India. The enhanced applicability limit of the IDA from 100 to 300 workers meant lifting the requirement of government approval for the retrenchment of regular workers in medium-sized industrial firms. This study focuses primarily on the state-level amendments to the IDA, raising the applicability limit of Chapter V-B.

The applicability limit of Chapter V-B of the IDA was raised from 100 to 300 workers in Andhra Pradesh and Maharashtra in 2015, in Haryana in 2016, in Jharkhand and Uttar Pradesh in 2017, and in Punjab in 2018. Several states have made this amendment after 2018. Those cases are not considered in the present study because the analysis period does not go beyond 2018.

The present analysis is confined to the organized sector of Indian manufacturing (which may also be called the registered or formal sector). These industrial units are registered as factories under the Factories Act, 1948, i.e., the units employ 10 or more workers with power or 20 or more workers without power.

The official definition of micro, small and medium-scale industries prevailing in India in 2018 was in terms of the value of the investment in plant and machinery: micro-enterprise, up to Rs 2.5 million; small-enterprise, up to Rs 50 million, and medium-enterprise, up to Rs 100 million. The focus of the analysis in the paper is on the industrial enterprises with the number of workers between 20 and 299. These units by and large belong to small or medium enterprises according to the official definition prevailing in 2018. Raising the threshold

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1 See Appendix III and Tables 1.3 and 2.1 in the Interim Report of the study titled “Impact Assessment Study of the Labour Reforms undertaken by the States,” prepared by the V. V. Giri National Labour Institute, NOIDA, and the Indian Institute of Public Administration, New Delhi, in 2021.
applicability limit of Chapter V-B of the IDA from 100 to 300 workers benefits the size class of 100-299 workers, and therefore, the growth of such units needs to be studied. However, the units employing 20 to 99 workers are also included in the study because a portion of these units (say in the size class of 50-99) employ contract workers instead of regular workers to stay below the limit of 100 workers (see Ramaswamy, 2013), and therefore they stand to gain from the raising of the threshold applicability limit. Also, raising the applicability limit under IDA was accompanied by raising the applicability limit under the CLA (in the same year or a nearby year) which will benefit enterprises employing below 50 workers. Hence, it is essential to include such enterprises in the analysis.

Materials and Methods

Data Sources

In this paper, the analysis is undertaken at the state level. A panel dataset on 13 selected states in India is used (seven states mentioned above that raised the threshold of applicability of Chapter V-B of the IDA during 2014-2018, and six other states, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Tamil Nadu, and West Bengal, which are included in the control group of states base on criteria discussed in Goldar, 2023). Data for 2006-07 (hereafter written as 2006) to 2018-19 (2018) are used for the analysis. For some analyses, because of the non-availability of data on a particular explanatory variable (the extent of export participation), data for a shorter period, 2009-2018, is used. The primary data source is the Annual Survey of Industries (ASI) (National Statistical Office, Ministry of Statistics and Programme Implementation, Government of India). In addition, data on some of the variables have been taken from the Handbook of Statistics on Indian States, Reserve Bank of India.

Hypotheses

The main hypothesis to be tested is that easing labour regulations in a state enhances the rate of entry (i.e., the pace of setting up) of new manufacturing SMEs in the state. A supplementary hypothesis is that the impact of easing labour regulations in a state on new manufacturing SMEs’ entry rate is conditioned by the power availability situation. The underlying logic is that an entrepreneur decides to set up a new industrial unit depending on several factors and considerations. Even if the policy environment becomes favourable, an entrepreneur may decide against setting up a new industrial unit if there are other severe disadvantages in the
business environment, shortages of power supply being one of the possible constraining factors.

**Computing the Number of New Manufacturing SMEs in Different States**

The new small and medium plants in organized manufacturing have been identified and estimated for each state each year from ASI unit-level data, based on the following criteria: (a) For a plant that is observed in ASI unit-level data in year T, its reported year of initial production is T, or T-1 or T-2, i.e., it is at most two years old, and (b) the plant employed 20 to 299 persons in year T. The sample weights are used to derive the estimated number of new manufacturing SMEs in each state each year.

**Econometric Methodology**

The analysis is done in two steps. In the first step, a multiple regression analysis is undertaken, using state-wise panel data for 2006-07 to 2018-19. The following equation is estimated:

\[
\ln(SME_{it}) = \alpha_i + \lambda_t + \beta \ln(TP_{i,t-1}) + \theta_1 D_{it} + \theta_2 P_{i,t-1} + \theta_3 [D_{it} \times P_{i,t-1}] + \gamma Z + u_{it} \quad (1)
\]

In this equation, \(SME_{it}\) denotes the number of new small and medium manufacturing plants in state \(i\) in year \(t\). \(TP_{i,t-1}\) denotes the total number of manufacturing plants in state \(i\) in the previous year \((t-1)\). Since the dependent variable will take a higher value for a bigger state, there is a need to control the scale effect, which is the purpose of including \(TP_{i,t-1}\) in the model. The time dummies, denoted by \(\lambda_t\), capture the influences of various factors exerting influence over time. In the equation, \(u_{it}\) is the random error term.

A dummy variable \(D\) is used to incorporate the effect of labour reforms in the seven states that eased labour regulations in the years 2014 to 2018. It takes the value of one for the observations for Rajasthan for the years 2014 (the year the IDA was amended in Rajasthan) to 2018 and zero for all other observations for Rajasthan (i.e., the observations for 2006 to 2013). For Andhra Pradesh, Haryana, Jharkhand, Maharashtra, Uttar Pradesh, and Punjab, the variable \(D\) is assigned the values of zero or one accordingly.

The variable \(P\) denotes the level of power availability in the state, which is divided (or normalized) by the Gross State Domestic Product (GSDP). This variable is taken with one year
lag to address any possible endogeneity issues. There is an interaction term involving D and P, which helps to test the second hypothesis stated earlier.

A set of control variables are included in the model, denoted by vector Z, whose coefficients are denoted by \( \gamma \). The following explanatory variables are included in the analysis: the length of roads in the state (in logarithms) and the length of railway routes in the state (in logarithms). Data on these two variables have been taken from the *Handbook of Statistics on Indian States*, Reserve Bank of India. These variables represent transport infrastructure development in the state. Taking the length of roads in the state (in logarithms) and the length of railway routes in the state (in logarithms) for the current year and the previous year and then applying principal component analysis, an index for transport infrastructure has been formed, varying across states and over time.

Three other variables are used as controls, all taken with one one-year lag. These have been formed by using the unit-level data of ASI. There are (1) the percentage of plants engaged in exports, (2) the share of imported materials in total materials consumed and (3) the average real (product) wage rate (logarithmic transformation applied) among SMEs in the state. These computations have been made for plants employing 50 to 299 workers.

In the second part of the analysis, a staggered difference-in-difference (DID) research design is adopted, and the DID estimation methodology proposed by Callaway and Sant’Anna (2021), which has certain methodological advantages, is applied.

Till recently, the two-way fixed effects model (TWFE) was commonly used for estimating the effect of policy changes. Lately, the severe limitations of this methodology have come to light (see Callaway and Sant’Anna, 2021; Baker et al., 2021; Chaisemartin and D’Haultfoeuille, 2022). The methodology suggested by Callaway and Sant’Anna (2021) takes care of these limitations.

**Summary Statistics**

Summary statistics on the variables used for the present analysis are shown in Table 1. For some variables, there are 169 observations (13 states for 13 years each), and for some other variables, there are 130 observations (13 states for ten years each). In the latter case, data are for 2008 to 2017 since the variables are taken with one one-year lag.
Table 1: Summary Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Observations</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of new SMEs in the state</td>
<td>169</td>
<td>289.1</td>
<td>248.2</td>
<td>10</td>
<td>1361</td>
</tr>
<tr>
<td>Total number of manufacturing plants in the state</td>
<td>169</td>
<td>14506.7</td>
<td>13555.5</td>
<td>1957</td>
<td>120,488</td>
</tr>
<tr>
<td>Power availability (in net bn units)</td>
<td>169</td>
<td>5556.7</td>
<td>3229.8</td>
<td>415</td>
<td>15,816</td>
</tr>
<tr>
<td>Gross state domestic product (GSDP) (Rs bn at 2011-12 prices)</td>
<td>169</td>
<td>5499.0</td>
<td>3663.8</td>
<td>955.9</td>
<td>19729.6</td>
</tr>
<tr>
<td>Power availability by GSDP (net crore units/ per Rs bn of GSDP)</td>
<td>169</td>
<td>1.05</td>
<td>0.31</td>
<td>0.37</td>
<td>1.86</td>
</tr>
<tr>
<td>Transport Infrastructure index (based on length of roads and rail routes)</td>
<td>169</td>
<td>0</td>
<td>1.87</td>
<td>-3.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Percent of SMEs engaged in exports</td>
<td>130</td>
<td>12.8</td>
<td>7.2</td>
<td>0.3</td>
<td>31.9</td>
</tr>
<tr>
<td>Share of imported materials in total materials consumed (%)</td>
<td>130</td>
<td>4.4</td>
<td>2.6</td>
<td>0.4</td>
<td>11.2</td>
</tr>
<tr>
<td>Real wage rate (Rs '000 per person per annum, at 2011-12 prices), state average</td>
<td>130</td>
<td>109.2</td>
<td>36.3</td>
<td>39.3</td>
<td>221.4</td>
</tr>
</tbody>
</table>

One crore=10 million

Source: Computed by the authors

All variables are at the state level. In some cases (e.g., the total number of plants), these are aggregated figures for the states, and in some other cases (e.g., the real wage rate), these are average figures for plants belonging to the state, estimated by the authors from unit-level ASI data.

Results

The results of the regression analysis are presented in Table 2. Equation (1) has been estimated by the fixed-effects model, which takes care of the unobserved heterogeneity among states. Robust standard errors have been computed clustered at the state level. The table presents two
sets of results: one set uses data for 2006-2018, and the other uses data for 2009-2018. In both cases, the year dummy variables are included. The estimate for 2009-2018 uses five control variables. The estimate for 2006-2018 uses only two controls. Since the data on exports made by plants are available only from 2008 and the variable is used with one one-year lag, it has not been possible to include it in the estimate for 2006-2018. Instead, data for 2009-2018 are used. For this reason, the imported materials variable and the real wage rate variables (which are derived from the same data source, viz. ASI unit-level data) have also not been used in the first regression.

Table 2: Determinants of the rate of entry of new small and medium manufacturing plants in different states, Regression results

Dependent variable: ln SMEs

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>Regression-1 2006-2018</th>
<th>Regression-2 2009-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln TP_{t-1}</td>
<td>0.112 (0.208)</td>
<td>0.703* (0.388)</td>
</tr>
<tr>
<td>Labour reforms dummy (D)</td>
<td>6.951 (3.586)*</td>
<td>6.824 (2.73)**</td>
</tr>
<tr>
<td>ln (PA/GSDP)_{t-1}</td>
<td>1.071 (0.322)**</td>
<td>0.498 (0.371)</td>
</tr>
<tr>
<td>Labour reforms dummy (D)* ln (PA/GSDP)_{t-1}</td>
<td>0.763 (0.388)*</td>
<td>0.760 (0.298)**</td>
</tr>
<tr>
<td>Transport infrastructure index</td>
<td>0.217 (0.222)</td>
<td>0.371 (0.267)</td>
</tr>
<tr>
<td>Real wage rate (in logarithm) (t-1)</td>
<td>-1.137 (0.530)**</td>
<td></td>
</tr>
<tr>
<td>% of plants in the state engaged in exports (t-1)</td>
<td>0.014 (0.009)</td>
<td></td>
</tr>
<tr>
<td>Share of imported materials in total materials (t-1) (%)</td>
<td>0.064 (0.043)</td>
<td></td>
</tr>
<tr>
<td>No. of observations</td>
<td>169</td>
<td>130</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.22</td>
<td>0.72</td>
</tr>
<tr>
<td>F-value and probability</td>
<td>74.8 (0.000)</td>
<td>7.6 (0.000)</td>
</tr>
</tbody>
</table>

Notes: (1) Analysis is confined to organized manufacturing. Data on 13 states are used (see text). Year dummy variables are included. (2) The notation for variables and the labour reforms dummy variable are explained in the text. TP = total number of manufacturing plants in the state. PA = power availability in the state. GSDP= Gross state domestic product at 2011-12 prices.

Robust standard errors clustered at the state level are shown in parentheses. *, **, *** statistically significant at the ten, five and one per cent level of significance, respectively.

Source: Authors’ computations from ASI unit-level data.
The estimated treatment effect coefficients obtained by applying the DID estimation methodology proposed by Callaway and Sant’Anna (2021) are reported in Table 3. The outcome variable is the number of new SMEs (in logarithms). Data for the period 2009-2018 are used for these estimates. The covariables used are the same as the controls used in the second regression in Table 2.

Table 3: Estimated Treatment Coefficients

<table>
<thead>
<tr>
<th>Outcome variable: logarithm of the number of new SMEs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-treatment year</td>
<td>Estimated coefficient</td>
</tr>
<tr>
<td>TP0</td>
<td>0.059 (0.022)***</td>
</tr>
<tr>
<td>TP1</td>
<td>0.552 (0.121)***</td>
</tr>
<tr>
<td>TP2</td>
<td>0.207 (0.094)**</td>
</tr>
<tr>
<td>TP3</td>
<td>1.287 (0.387)***</td>
</tr>
<tr>
<td>Post-treatment average</td>
<td>0.526 (0.145)***</td>
</tr>
<tr>
<td>No. of observations used</td>
<td>98</td>
</tr>
</tbody>
</table>

Note: Standard error in parentheses. **, *** statistically significant at five and one per cent level, respectively. The covariables used for the analysis are explained in the text (same as in Regression-2 in Table 2). TP0 is the treatment effect in the year of treatment (i.e., the year in which the enhancement of the applicability limit under the IDA was done; see text for explanation). TP1, TP2 and TP3 are the treatment coefficients one, two and three years after the treatment, respectively.

Source: Authors’ computations.

Discussion

It is seen in Table 1 that the coefficient of the labour reforms dummy, i.e., the dummy variable representing the easing of labour regulations, is positive and statistically significant. These results indicate that the labour reforms in the previously mentioned seven states that eased labour regulations during 2014-2018 favourably impacted the entry rate of new manufacturing SMEs in those states.

The coefficient of the power availability variable is positive in both regressions and statistically significant in one of them. The coefficient of the interaction term involving the power availability variable and the labour reforms dummy variable is positive and statistically significant in both regressions. Two inferences may be drawn from the results obtained. First, greater availability of power enhances new SMEs’ entry rate. Second, easing labour regulations has a more beneficial effect on SME entry if the region has an abundant power supply. A
positive impact of greater power availability on new investment in industries is expected. The results of empirical analysis bear this out.

As regards the other explanatory variables in the regression equations, the signs of the estimated coefficients are as expected. Particularly, note the positive coefficient of the transport infrastructure variable, implying that better transport infrastructure encourages entrepreneurs to set up new SMEs. That a positive relationship exists between transport infrastructure and the rate of entry of new firms in India has been noted in the study by Fernandes and Sharma (2012).

The coefficient of the wage rate is negative and statistically significant. Thus, other things remaining the same, a state with relatively lower wages tends to attract more SMEs to be located there. This finding is expected, and the results are consistent with the expectation.

The estimates of the treatment coefficient in Table 3 based on a DID research design are consistently positive and statistically significant. These estimates confirm the finding from Table 2 that easing labour regulation enhances new SMEs’ entry rate.

**Concluding Remarks**

The study’s main finding is that the easing of labour regulations boosts the entry rate of new small and medium-sized manufacturing enterprises. This finding is a matter of great significance for an emerging economy because creating manufacturing jobs on an abundant scale is essential for structural transformation. Analysis of data on Indian manufacturing reveals that the major part of the increase in industrial employment is not because the existing plants add to their workforce but because new industrial enterprises are set up.

Another significant finding emerging from the results of this study is that higher availability of power in a state encourages the setting up of new small and medium-sized manufacturing enterprises in the state. Interestingly, a strong positive effect of transport infrastructure, measured on the basis of the length of roads and railway routes, is not found. An interesting question is why power infrastructure has played a much more critical role than transport infrastructure in encouraging the establishment of new small and medium-sized manufacturing enterprises. However, examining this matter is beyond the scope of this paper.
The research presented above indicates that the labour reforms led to a faster entry rate of new small and medium manufacturing plants. This significantly contributed to employment growth because there is a link between the entry of new plants and job creation. This relationship is obvious. Nonetheless, to establish econometrically the link between the entry of new small and medium manufacturing plant and job creation, an econometric analysis is presented in Annexure A which shows a significant positive relationship between new plant entry of job creation.
References:


The regression results presented in Tables 2 and 3 indicate that labour reforms in six Indian states during 2014-2017 led to an elevated entry rate of new small and medium manufacturing plants. This is obviously expected to lead to increased employment generation. Nonetheless, an econometric analysis of the link should prove helpful in establishing this point, and that is attempted below.

A regression analysis is undertaken to provide empirical evidence to establish the link between the rate of entry of new manufacturing SMEs and the growth rate in manufacturing employment. In the regression equation estimated, the growth rate in employment (denoted by $\Delta \ln E$, where $E$ denotes employment) is taken as the dependent variable, and the rate of entry of new manufacturing SMEs (the number of new plants divided by the total number of plants) is taken as an explanatory variable. The regression equation is estimated by using state-wise panel data on all states (and union territories) for the years 2009-10 to 2017-18. Two other explanatory variables have been used. These are the rate of growth in deflated output of the organized manufacturing sector of the state and the rate of change in the contract worker intensity (defined as the share of contract workers in the total number of workers). The model is estimated by applying the panel quantile regression method. The results are reported in Table A.1.

It is seen in Table A.1 that there is a significant positive effect of the rate of entry of new small and medium manufacturing plants on the growth rate of manufacturing employment. This result empirically establishes the link between the rate of entry of new manufacturing SMEs and the growth rate in employment. These results, considered together with the results in Tables 2 and 3 bring out the positive effect of labour reforms on the rate of employment growth.
Table A.1: Impact of the rate of entry of new small and medium manufacturing plants on employment growth, Panel quantile regression

Dependent variable: $\Delta \ln E$  
No. of observations=290

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Regression-A.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta \ln (NP/TP)$ - rate of entry of new small and medium manufacturing plants</td>
<td>0.793***</td>
</tr>
<tr>
<td></td>
<td>(0.141)</td>
</tr>
<tr>
<td>$\Delta \ln Q$</td>
<td>0.150***</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
</tr>
<tr>
<td>$\Delta CI$</td>
<td>0.593***</td>
</tr>
<tr>
<td></td>
<td>(0.082)</td>
</tr>
<tr>
<td>Chi-squared and probability (joint test of all three coefficients)</td>
<td>104.8</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

Notes: All States and union territories are included. $E = \text{number of persons employed}$. $Q = \text{deflated value of output}$; $CI = \text{contract worker intensity}$, the number of contract workers divided by the total number of workers. $NP$ and $TP$ are the counts of new (small and medium) plants and total plants.

Standard errors are in parentheses. *** statistically significant at the one per cent level of significance.

Source: Authors’ computations from ASI unit-level data.

The coefficient of the variable representing increases in contract worker intensity is positive and statistically significant. Thus, the results suggest that an increase in contract worker intensity is associated with faster employment growth. This finding is consistent with the findings of Goldar and Ghosh (2016) and Goldar (2018).