Management, Firms, and Labor Regulation

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Abstract: This paper investigates the impact of labor market regulations in India. These regulations vary by state and provide different protections depending on the type of the worker. Among industrial workers, permanent employees have considerable stronger protections than contractual employees. These are substitutes for each other. Managerial employees have no protections. This paper finds that (i) in response to short run demand shocks, there is no significant change in the total management input, suggesting that the institutional factors of the market for managers has larger search/firing costs than that for industrial workers. Contrary to the literature, we also find that (ii) there is no productivity change when there is an influx of contract workers. We also find that the nature of management activity changes depending on the mix of employees - (iii) when more contract workers are hired, managers spend more time in manufacturing activities. This suggests that there are complementarities between management time and contract labor input in manufacturing and that the manner of deployment of management capital within a firm is endogenous even if the overall level is fixed. This could account for one of the features that is widely observed in empirical studies - firms in regions with strong employee protections have lower steady state productivities.

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I Introduction

Labor market regulations that increase firing costs can have several effects. One predicted effect is a decrease in the variation of employment in response to an economic shock - less firing during downturns and less hiring during an uptick. Adhvaryu, Chari & Sharma (2013) (hereafter ACS) demonstrate this empirically in India. This paper addresses how firm adjustment to economic shocks along other margins is affected by labor regulations.

Apart from impacting direct labor input, labor regulations may affect other inputs depending on the firm's production function. For example, if capital and labor are complements, firms may want to increase capital inputs as well in response to a positive economic shock. However, whether they do so in equilibrium depends on capital adjustment costs. If capital adjustment costs are relatively high, then there would be no change in the capital employed in response to a short term economic shock.

This paper lies at the intersection of two strands of the literature. The first focuses on regulation in developing countries. There is some evidence to suggest that labor regulations in India - the Industrial Disputes Act (IDA, 1947) of India - has resulted in lower output, employment, investment and productivity in manufacturing [Besley & Burgess (2004), Ahsan & Pages (2009)] and lower growth (Aghion et al. (2008)). Further evidence suggests a reduced sensitivity to employment in industry in response to lower demand shocks (ACS). There is however, some evidence to show that firms are able to circumvent the protections that this law provides to workers by hiring contract workers through a third party.[1] Chaurey (2015) finds that firms in stricter labor regimes hire more contract workers in response to local economic shocks. Apart from this, Nagaraj (2002) questions whether these regulations were even enforced.

The second focuses on the exact role of management in the firm, which is still an open question in the literature. There are two main schools of thought - management acts as a technology (as in Mundlak (1961)) or management is an optimal input (as is common in organizational studies, such as Gibbons & Roberts (2013)). Our

[1] See Ramaswamy (2013).

main findings provide some evidence for the second perspective, by measuring how managers spend time within the firm. In our framework, therefore, management plays the role of an input that can be deployed as desired. Our focus is not on management as a set of ideas/principles that are non-rival. That approach would translate to thinking of management as a technology. Our findings, therefore, are in contrast with those of Bloom, Sadun & Reenen (2014), who find that management largely plays the role of technology. Our measures of management admittedly differ from their study. Our results also support the findings of Bloom et al. (2013) and Akcigit, Alp & Peters (2016), that there are strong institutional constraints to management as an input that can be freely adjusted along the extensive margin.

This paper is closely related to ACS and Chaurey (2015). The empirical strategy used is similar to both. Rainfall shocks are interacted with measures of labor regulation to examine variation in various forms of labor input. The IDA imposes penalties for firing permanent workers from sizable firms. ACS investigates the impact on aggregate employment and whether the effects of these shocks vary across this size threshold. They find that large firms in states with strict labor laws tend to vary less in employment in response to these shocks. However, a feature of this law is that contract workers can be dismissed without any penalties. These workers are natural substitutes for permanent employees, so that a firm is incentivized to use contract workers in case of short term economic fluctuations. The incentive to do so is governed by how strict the prevailing labor law is for permanent workers. This is investigated by Chaurey (2015), who finds that firms in states with stricter labor laws hire relatively more contract workers in response to demand shocks. This paper investigates the employment trends of management workers, who are not protected by the law. This setting is suited to the analysis for several reasons. First, rainfall shocks provide reasonable random and local short term economic variations. Despite years of progress, India is still largely a rural agrarian economy so that rainfall would be expected to have large effects on incomes and labor supply. Second, labor laws are under the jurisdiction of state governments that have made several amendments so that there is significant variation over space. Third, within country variation is less likely to suffer from omitted variable bias concerns that are typical of cross country

studies. Finally, the availability of firm level panel data allows the observation of the relevant channel of firm responses.

We find several informing facts about the nature of firm adjustment to economic shocks. First, there is no differential adjustment of capital stocks across regimes. This suggests that there are no differences in complementarities between contract and permanent labor. Second, we find that there is no differential adjustment in the total manager man-days worked. However, there is a crucial dependence of the nature of manager time spend that varies depending on the prevailing regulatory regime. Manager man-days spent on manufacturing activities increases significantly in pro-employee states, which see a large influx in contract workers (Chaurey (2015)). There is no significant change in management man-days worked in non-manufacturing activities, though the magnitudes are negative. This suggests two things. First, there are large institutional frictions when it comes to hiring/firing new managers. Since there are no legal hurdles to firing managers, this must be a search or training cost. Second, there are specific complementarities between management time spent on manufacturing activities and contract labor time spent on manufacturing activities. The nature of these complementarities can arise in several ways - Guadalupe (2003) finds that fixed term contract workers experience higher accident and injury rates at work. Krueger & Mas (2004) find that contract worker use can result in lower output quality. Finally, we find that there is no decrease in short run firm productivity when contract workers are hired. This is despite concerns that contract workers might have low productivity due to lower firm specific human capital adjustment or adverse selection (Soundarajan (2015)). Management adjustments might account for this.

The findings here might provide one possible mechanism for why firms in pro-worker states have lower productivity (Besley & Burgess (2004)]). If long run productivity is a function of management time not spent directly on supervision, then the periodic transfer of management input to manufacturing activities would come at a cost of lower long run productivity.

The rest of the paper is laid out as follows. Section II discusses labor laws in India. Section III describes the data, and Section IV the empirical strategy. Results are presented in Section V and Section VI concludes.

II Labor Laws in India

The Industrial Disputes Act (IDA) of 1947 governs labor laws in India. It covers various aspects such as resolution of industrial disputes by setting up tribunals and labor courts, hiring and firing workers, closure of establishments, strikes and lockouts etc. in the formal sector. Labor is a subject in the concurrent list of the Indian constitution; hence both the federal and the state governments can make amendments to these laws. Some of these amendments have increased worker protection by making it costlier for firms to fire workers, and others have made it easier for firms to hire and fire workers. Two sections of the IDA that are often mentioned in discussions about labor laws in India are sections V-A and V-B. Both these sections make it hard for firms to lay-off permanent workers. For example, under section V-A, in any firm with 50 or more permanent workers, in the event of lay-offs, every worker needs to be given a month's notice and has to be paid fifty percent of basic wages and a dearness allowance for each day that they are laid off (maximum of 45 days). Section V-B covers all establishments with 100 or more permanent workers and requires firms to take government permission to lay-off even a single worker. Furthermore, closing down of establishments also requires sixty days (Section V-A) or ninety days (Section V-B) of prior notification with the government. Many states have amended the provisions of these two sections either to make it worker-friendly or employer-friendly. The amendments to these laws by different states have meant that states within India have substantially different labor regimes.

The provisions under IDA not only differ by states, but also differ by the type of workers. Importantly, IDA regulations cover permanent workers and managerial staff, but do not cover contract workers and casual workers. Contract workers are hired through contractors and are on the payrolls of the contracting agency (therefore not on the payrolls of the employing firm directly). Contract workers have lower wages in general than permanent workers and are not covered by trade unions. Firms are free to hire and fire contract workers with changing economic conditions without being subject to the provisions of the IDA.

III Data

We primarily use three datasets for our analysis: (i) The Annual Survey of Industries (ASI) firm-level panel data set and (ii) Rainfall data from Terrestrial Precipitation: 1900-2010 Gridded Monthly Time Series (version 3.01), Center for Climatic Research, University of Delaware, and (iii) Labor regulation measures from Besley & Burgess (2004) and (Gupta, Hasan & Kumar (2009). For the firm-level outcomes, we use the Annual Survey of Industries (ASI) firm-level panel data for the years 1998-99 to 2007-08. The ASI data set is collected by the Ministry of Statistics and Program Implementation (MoSPI), India, and covers all industrial units covered under Sections 2(m)(i) and 2(m)(ii) of the Factories Act, 1948. This includes all firms employing 10 or more workers using electricity and 20 or more workers if the unit does not use electricity. There is a distinction between the census sector (firms covered in the data every year) and the sample sector in the ASI data set. Those firms in the census frame are covered each year and a third of the firms in the sample frame are randomly selected every year. The census sector mostly covers the larger firms (more than a 100 employees) and firms in industrially backward states[2], and for the sample sector the data set provides the weights for each firm (the inverse of the probability of being covered in the data set). This data is extremely well-suited to our analysis as it provides information on the number of permanent workers, contract workers, and the number of managerial and supervisory workers each year, along with the number of man-days worked by each type of worker in both manufacturing and non-manufacturing activities. For the purposes of this analysis, we restrict the sample to the major states of India[3] and to the manufacturing sector firms only.

We then match the rainfall data available from Terrestrial Precipitation: 1900-2010 Gridded Monthly Time Series (version 3.01) to the geographic center of each district in the ASI data set. We define rainfall shocks in the same way as Jayachandran

[2]This includes Manipur, Meghalaya, Nagaland, Tripura and Andaman and Nicobar Islands.

[3]We remove the states of Jammu and Kashmir, Meghalaya, Manipur, Nagaland, and Tripura, and the union territories.

(2006), Kaur (2015), Chaurey (2015) and ACS where

$$\text{rainfall shock} = \begin{cases} 1 & \text{if rainfall in the district is above the 80th percentile} \\ 0 & \text{if rainfall in the district is between the 20th and 80th percentile} \\ -1 & \text{if rainfall in the district is below the 20th percentile} \end{cases}$$

Our primary measure of rainfall shocks is the shocks to rainfall (defined above) in the previous year. This is similar to the analysis in Chaurey (2015) and gives firms time to respond to shocks to the local economy.

Finally, we use labor regulation measures that are standard in the literature from Besley & Burgess (2004)(BB henceforth) and (Gupta, Hasan & Kumar (2009) (GHK henceforth). BB code all amendments made by states to the IDA between 1958-92. They call an amendment "pro-worker" if it makes it costlier (or harder) for firms to fire workers, thus protecting workers. A "pro-employer" amendment makes it easier to fire workers, thereby helping employers. All other amendments were coded as "neutral". These amendments are then coded as +1 (pro-worker), 0 (neutral) and -1 (pro-employer), and the cumulative score over 1958-92 determines the labor regime in a particular state.[4] According to this formulation, the "pro-worker" states include - Maharashtra, West Bengal, and Orissa, "pro-employer" states include - Rajasthan, Kerala, Karnataka, Tamil Nadu, Andhra Pradesh and Gujarat[5]. The rest of the states are then coded as "neutral" and include - Punjab, Haryana, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Bihar, Assam, Chhattisgarh, Jharkhand and Madhya Pradesh. The second measure of labor regulations comes from GHK, where a simple majority rule is assigned to the various labor regulation measures used in different papers.[6] According to their codes, "pro-worker" states include Maharashtra, West Bengal, and Orissa, "pro-employer" states include Rajasthan, Karnataka, Tamil Nadu, Uttar Pradesh, and Andhra Pradesh and finally "neutral" states include Pun-

[4]ACS make one change to the BB codes and change the code for Karnataka from "neutral" to "pro-employer". We will use this change in our analysis.

[5]Gujarat is coded as a neutral state until 2004 and then is coded as a pro-employer state. In 2004, Gujarat provided exemptions from the Chapter VB of IDA under the SEZ act. See Malik (2007) for details.

[6]See Bhattacharjea (2006), Ahsan & Pages (2009) for other labor regulation measures.

jab, Haryana, Himachal Pradesh, Uttarakhand, Bihar, Assam, Chhattisgarh, Jharkhand, Madhya Pradesh, Goa, Gujarat, and Kerala.
The summary statistics are shown in Table 1.

IV Empirical Strategy

In this paper, we would like to test the differential responses of firms across labor regimes to transitory demand shocks. A rainfall shock might represent a demand shock for industrial firms through its effects on rural household incomes. For example, a good rainfall translates into higher household incomes and thus a higher demand for industrial goods. A rainfall shock might also represent a labor supply shock for industrial firms as the demand for agricultural workers might change with a good or bad rainfall. Chaurey (2015) empirically shows that rainfall shocks across states in India represent transitory demand shocks to firms. This is because firms increase contract labor employment, and industrial wages, but do not change agricultural wages in response to a rainfall shock.[7] We take this empirical result as given, and then look at the differential response of firms located in different labor regimes across India, in response to these transitory demand shocks. We basically look at the employment responses of firms to rainfall shocks and rainfall shocks interacted with labor regulation measures at the district level. Formally, we use an empirical specification similar to ACS and Chaurey (2015) where we run regressions of the form:

$$\begin{aligned} y_{idt} &= \theta_i + \lambda_t + \beta_0 rainshock_{dt-1} + \beta_1 (rainshock_{dt-1} \times Proworker_{dt}) \\ &\quad + \beta_2 (rainshock_{dt-1} \times Proemployer_{dt}) + \delta_s t + \varepsilon_{idt} \end{aligned}$$

In this specification y_{idt} represents an outcome of interest for firm i, in district d, in year t. We use outcome variables such as log (contract workers), log (permanent workers), log (managerial and supervisory workers), along with the total man-days

[7] See Chaurey (2015) for further details. If both employment and wages increase in response to a rainfall shock, it must be the case that the demand channel is stronger than the labor supply channel.

employed for each of these categories of workers.[8] λ_t, and θ_i represent year and firm fixed effects. Hence these regressions control for macroeconomic shocks affecting all firms in a particular year, and also control for time invariant firm specific characteristics that might play an important role in the firm's employment decisions. Note that in these regressions, our measure of rainfall shocks is the lagged rainfall shock as in Chaurey (2015). The omitted labor regulation category in these regressions are the "neutral" category. Thus, β_1 shows the differential effect of firms in "pro-worker" labor regimes as compared to "neutral" labor regimes, and β_2 measures the differential effect of a demand shock on a firm in a district with "pro-employer" laws compared to a firm in a "neutral" district in response to a demand shock. It is important to note here that we are only interested in the differential effect and not on the direct effects of rainfall shocks. Hence, finding a positive (negative) differential effect on firms in pro-worker states only implies that there is a higher (lower) effect as compared to firms in pro-employer or neutral regimes. It does not mean that as a response to demand shocks, firms in pro-employer states would not hire workers. Finally, we also control for state-specific time trends ($\delta_s t$) in each regression specification. This alleviates the concern that the results are not being driven by the differential time trends in different states.

V Results

In this analysis, we analyze the differential employment responses of firms located across labor regulations to transitory demand shocks. In Table 2, we first show results on the numbers of different kinds of workers. In columns 1 through 4, we essentially replicate results from Chaurey (2015). We find that in response to demand shocks (rainfall shocks), firms in pro-worker labor regimes differentially hire more contract workers (extensive margin) as compared to firms in neutral states by 4.8%-5.8%, depending on the choice of the labor regulation measure. There is no differential response for firms in pro-employer states as compared to firms in neutral states. Taken

[8]Note that man-days shows the number of workers $\times$ number of hours.

together, firms in pro-worker states differentially hire more contract workers than firms in pro-employer states. This is the extensive margin of adjustment for firms. In columns 3 and 4, we find no statistically significant differential response to the hiring of permanent workers across different labor regimes. This seems reasonable as firms would not hire a permanent worker in response to a temporary demand shock, knowing that once hired, permanent workers are hard to fire. In columns 5 and 6, we look at the differential effects on the number of managerial and supervisory staff. We find no statistically significant differential effects in the hiring of managers across different labor regimes in response to a demand shock.

Next, we focus on the man-days worked by the different kinds of workers - contract workers, and permanent workers. First, in Table 3, we look at the differential effects for firms in terms of man-days of contract workers. In columns 1 and 2, we find that firms in pro-worker states have differentially higher total man-days worked by contract workers (10.2%-12.9%). We then break down the total man-days worked by contract workers into man days worked by contract workers in manufacturing (columns 3 and 4) and non-manufacturing activities (columns 5 and 6). Interestingly, we find that most of the differential effects in total man-days for contract workers is accounted for by the man-days in manufacturing activities. In columns 3 and 4, we find that the man-days for contract workers in manufacturing activities differentially increases by 10.5%-12.9%, in pro-worker states. There is no such differential increase in the man-days for contract workers in non-manufacturing activities. We interpret these results as suggesting that following a demand shock, more contract workers are hired and made to work on the shop floor in factories.

In Table 4, we look at the differential effects across firms in the man days worked by permanent workers (columns 1-2), man days worked by permanent workers in manufacturing activities (columns 3 and 4) and the man days worked by permanent workers in non-manufacturing activities (columns 5 and 6). We find no statistically significant differential responses in terms of man days of permanent workers in firms in pro-worker states as compared to firms in pro-employer states.

There is some concern that the differential influx of contract workers in to firms in pro-worker states, following a rainfall shock might lead to declines in firm productiv-

ity. This could be because contract workers are less trained and more likely to make mistakes, or because they have less firm-specific human capital. We check this in Table 5. We measure firm productivity using the Levinsohn & Petrin (2003) method.[9] We find no differences in productivity of firms located across different labor regimes in response to a rainfall shock. This could suggest that firms in pro-worker states increase supervision of these contract workers on the shop floor. We consider this margin by looking directly at the man-days spent by managers on manufacturing and non-manufacturing activities in Table 6.

In Table 6, we look at the effects for managerial and supervisory staff. In columns 1 and 2, we look at the total man-days for managerial workers and find no differential effect. However, when we break down total man days in to man days directed to manufacturing activities and non-manufacturing activities, we see firms in pro-worker states responding differentially to a demand shock (compared to a firm in a pro-employer state). In columns 3 and 4, we find that firms in pro-worker states differentially increase the man-days worked by managers in manufacturing activities. We find no differential effect in the man-days in non-manufacturing activities. This seems to suggest that firms respond along the intensive margin in terms of managerial activity in response to the increase in the number of contract workers. This is suggestive evidence that managers spend more time on supervising manufacturing activities, and this counterbalances the possible negative effects on firm productivity that might arise due to hiring of contract workers.

Finally, in Table 6, we look at the effects for managerial and supervisory staff. In columns 1 and 2, we look at the total man days for managerial workers and find no differential effect. However, when we break down total man days in to man days directed to manufacturing activities and non-manufacturing activities, we see firms in pro-worker states responding differentially to a demand shock (compared to a firm in a pro-employer state). In columns 3 and 4, we find that firms in pro-worker states, differentially increase the man days worked by managers in manufacturing activities. We find no differential effect in the man days in non-manufacturing activities. This

[9]The main innovation in Levinsohn & Petrin (2003) is the use of raw material expenditures to proxy for the unobserved productivity shock.

seems to suggest that firms respond along the intensive margin in terms of managerial activity in response to the increase in the number of contract workers.

VI Conclusion

This paper investigates the response of firm inputs to local rainfall shocks in India, using a strategy similar to ACS and Chaurey (2015), and how that is affected by the prevailing labor market regime. We find that pro employee legislation, that is associated with a larger use of contract labor, also sees a diversion of fixed management capital to manufacturing activities. This suggests that management time spent in manufacturing activities is a complement to contract labor time spent in manufacturing activities. This also suggests that the deployment of firm management capital varies with the prevailing labor market regime.

It would be interesting to if we could make predictions of the welfare consequences of these adjustments. It is not clear exactly what managerial hours in manufacturing are spent on. Part of it might be a substitute to lower firm specific human capital investments by contract workers. We need a better idea of what goes on inside a firm and need to take a closer look at the production process to answer this question definitively. This is a promising avenue for future work.

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Table 1: Summary statistics

Variables	Pro-worker	Neutral	Pro-employer
Contract Workers	27.110	21.89	19.908
	[72.525]	[64.651]	[63.781]
Permanent Workers	92.765	72.606	90.38703
	[193.903]	[160.952]	[174.058]
Managers	20.43	13.93	14.29
	[41.161]	[32.783]	[31.887]
Total man days for contract workers	10848.82	8127.98	11881.04
	[48175.65]	[45343.51]	[192591.5]
Total man days for permanent workers	52284.71	34011.55	43531.56
	[211011.0]	[161912.8]	[230536.8]
Total man days for managers	8183.88	5583.82	5379.90
	[35639.43]	[46219.60]	[26470.19]
Manufacturing man days for contract workers	33189.68	29306.67	47900.99
	[79832.24]	[82365.51]	[391765.8]
Non-manufacturing man days for contract workers	246.12	219.19	415.63
	[2655.93]	[3127.15]	[4720.94]
Manufacturing man days for permanent workers	40744.05	26251.15	31413.66
	[182938]	[133210]	[92946.42]
Non-manufacturing man days for permanent workers	1305.35	588.87	716.60
	[11417.68]	[17127.99]	[6325.37]
Manufacturing man days for managers	7679.51	5269.90	5102.53
	[33538.72]	[37626.42]	[25365.18]
Non-manufacturing man days for managers	238.39	106.18	151.07
	[1903.68]	[3023.75]	[1323.74]
% using contract workers	0.324	0.275	0.249
	[0.468]	[0.447]	[0.433]
Positive rainfall shock	0.121	0.135	0.137
	[0.326]	[0.342]	[0.344]
Negative rainfall shock	0.126	0.122	0.122
	[0.332]	[0.327]	[0.287]
Firm-year observations	60,000	129,281	130,644

Standard deviation in square brackets.

Table 2: Number of workers

VARIABLES	(1) Log [contract workers]	(2) Log [contract workers]	(3) Log [permanent workers]	(4) Log [permanent workers]	(5) Log [managers]	(6) Log [managers]
Rainshock (t-1)	0.00138	-0.00952	0.00899	0.0109	-0.000295	-0.00296
	(0.0159)	(0.0174)	(0.0107)	(0.0113)	(0.00564)	(0.00535)
Rainshock (t-1) x						
Pro-employer states (BB)	0.0102		-0.0101		0.00292	
	(0.0210)		(0.0147)		(0.00895)	
Pro-worker states (BB)	**0.0481****		-0.0102		0.0118	
	(0.0234)		(0.0137)		(0.0101)	
Pro-employer states (GHK)		0.0334		-0.0144		0.00856
		(0.0249)		(0.0161)		(0.00865)
Pro-worker states (GHK)		**0.0588****		-0.0121		0.0145
		(0.0242)		(0.0142)		(0.0100)
Constant	-50.48*	-50.07*	8.589	8.649	-37.94**	-37.87**
	(25.82)	(25.76)	(19.08)	(19.13)	(17.23)	(17.21)
Observations	311,348	311,348	311,348	311,348	264,166	264,166
R-squared	0.812	0.812	0.930	0.930	0.920	0.920
firm FE	YES	YES	YES	YES	YES	YES
year FE	YES	YES	YES	YES	YES	YES
State-specific time trend	YES	YES	YES	YES	YES	YES
Age controls	YES	YES	YES	YES	YES	YES

*** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered at the district level.

Table 3: Contract workers

	(1) Log [mandays total]	(2) Log [mandays total]	(3) Log [mandays in manufacturing activities]	(4) Log [mandays in manufacturing activities]	(5) Log [mandays in non-manufacturing activities]	(6) Log [mandays in non-manufacturing activities]
Rainshock (t-1)	-0.00272	-0.0305	-0.00605	-0.0310	0.00938	0.00913
	(0.0367)	(0.0391)	(0.0368)	(0.0393)	(0.00996)	(0.00661)
Rainshock (t-1) x						
Pro-employer states (BB)	0.0376		0.0407		-0.00638	
	(0.0514)		(0.0515)		(0.0147)	
Pro-worker states (BB)	**0.102***		**0.105***		0.00251	
	(0.0589)		(0.0588)		(0.0156)	
Pro-employer states (GHK)		0.0969*		0.0943		-0.00602
		(0.0583)		(0.0585)		(0.0127)
Pro-worker states (GHK)		**0.129****		**0.129****		0.00280
		(0.0601)		(0.0602)		(0.0137)
Constant	-115.6	-114.7	-113.3*	-112.7	-12.70	-12.58
	(70.23)	(70.37)	(68.69)	(68.85)	(14.64)	(14.59)
Observations	311,348	311,348	311,348	311,348	313,703	313,703
R-squared	0.799	0.799	0.798	0.798	0.565	0.565
firm FE	YES	YES	YES	YES	YES	YES
year FE	YES	YES	YES	YES	YES	YES
State-specific time trend	YES	YES	YES	YES	YES	YES
Age controls	YES	YES	YES	YES	YES	YES

*** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered at the district level.

Table 4: Permanent workers

	(1) Log [mandays total]	(2) Log [mandays total]	(3) Log [mandays in manufacturing activities]	(4) Log [mandays in manufacturing activities]	(5) Log [mandays in non-manufacturing activities]	(6) Log [mandays in non-manufacturing activities]
Rainshock (t-1)	0.0135	0.0228	0.0133	0.0226	0.0221	0.0358
	(0.0183)	(0.0192)	(0.0183)	(0.0190)	(0.0222)	(0.0231)
Rainshock (t-1) x						
Pro-employer states (BB)	-0.0147		-0.0144		0.00523	
	(0.0252)		(0.0260)		(0.0346)	
Pro-worker states (BB)	-0.00650		0.00674		-0.0558*	
	(0.0241)		(0.0235)		(0.0302)	
Pro-employer states (GHK)		-0.0347		-0.0344		-0.0234
		(0.0269)		(0.0272)		(0.0320)
Pro-worker states (GHK)		-0.0156		-0.00237		-0.0694**
		(0.0250)		(0.0242)		(0.0312)
Constant	9.876	9.626	-64.18	-64.43	-23.60	-24.41
	(33.84)	(34.11)	(78.26)	(78.58)	(25.41)	(25.18)
Observations	311,348	311,348	311,348	311,348	313,703	313,703
R-squared	0.887	0.887	0.881	0.881	0.768	0.768
firm FE	YES	YES	YES	YES	YES	YES
year FE	YES	YES	YES	YES	YES	YES
State-specific time trend	YES	YES	YES	YES	YES	YES
Age controls	YES	YES	YES	YES	YES	YES

*** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered at the district level.

Table 5: Total Factor Productivity

	(1) Log (TFP)	(2) Log (TFP)
Rainshock (t-1)	-0.00425	-0.00159
	(0.00379)	(0.00391)
Rainshock (t-1) x		
Pro-employer states (BB)	0.00701	
	(0.00535)	
Pro-worker states (BB)	0.00290	
	(0.00614)	
Pro-employer states (GHK)		0.00127
		(0.00527)
Pro-worker states (GHK)		0.000225
		(0.0165)
Constant	-9.140	-9.350
	(10.58)	(10.65)
Observations	219,722	219,722
R-squared	0.809	0.809
firm FE	YES	YES
year FE	YES	YES
Age controls	YES	YES
State-specific time trend	YES	YES

*** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered at the district level.

Table 6: Managers and Supervisory staff

	(1) Log [mandays total]	(2) Log [mandays total]	(3) Log [mandays in manufacturing activities]	(4) Log [mandays in manufacturing activities]	(5) Log [mandays in non-manufacturing activities]	(6) Log [mandays in non-manufacturing activities]
Rainshock (t-1)	-0.00199	-0.00274	-0.00375	-0.00802	-0.0124	0.00742
	(0.00724)	(0.00700)	(0.00812)	(0.00790)	(0.0157)	(0.0191)
Rainshock (t-1) x						
Pro-employer states (BB)	0.00681		0.00687		0.0329	
	(0.0122)		(0.0135)		(0.0279)	
Pro-worker states (BB)	0.0173		**0.0372****		-0.0102	
	(0.0125)		(0.0160)		(0.0289)	
Pro-employer states (GHK)		0.00856		0.0160		-0.00801
		(0.0118)		(0.0128)		(0.0263)
Pro-worker states (GHK)		0.0179		**0.0414****		-0.0301
		(0.0125)		(0.0161)		(0.0304)
Constant	-43.06**	-43.14**	-90.08*	-90.00*	-43.90*	-45.47*
	(21.55)	(21.59)	(47.56)	(47.47)	(25.90)	(25.79)
Observations	264,166	264,166	264,166	264,166	313,703	313,703
R-squared	0.916	0.916	0.889	0.889	0.720	0.720
firm FE	YES	YES	YES	YES	YES	YES
year FE	YES	YES	YES	YES	YES	YES
State-specific time trend	YES	YES	YES	YES	YES	YES
Age controls	YES	YES	YES	YES	YES	YES

*** p<0.01, ** p<0.05, * p<0.1. Standard errors clustered at the district level.