Firing Costs and Flexibility: Evidence from Firms' Employment Responses to Shocks in India*

Achyuta Adhvaryu[†] A. V. Chari[‡] Siddharth Sharma[§]

October 2009

`Preliminary Draft: Comments Welcome`

Abstract

The effects of job security provisions on labor demand have been extensively discussed in the theoretical literature, but direct empirical tests of these effects are difficult to obtain. We provide the first such test of a simple prediction: The employment responses of firms to wage and/or demand fluctuations should be declining in the extent of job security provision. Our setting is rural India, where industry co-exists with agriculture. We exploit the fact that fluctuation in rainfall within districts, through its effects on agricultural productivity, creates exogenous variation in the demand for local industry as well as variation in the supply of labor. Using a measure of labor regulation strictness, we compare factories' input and output responses to shocks in pro-worker and pro-employer districts. Our results confirm the theory's predictions: employment adjustment in the industrial sector to these shocks is larger in regions where labor regulations are less restrictive. In areas with stricter regulations, factories appear to be achieving the same adjustment in output by adjusting intermediate inputs more intensively than labor, with no additional loss in profit. The results suggest that labor laws in India are effective at buffering the impact of shocks on industrial laborers, and that firms are able to adjust along non-labor margins so as to compensate for their lack of employment flexibility.

*We would like to thank Kaushik Basu, Jim Berry, Prashant Bharadwaj, Peter Brummund, Fernanda Lopez de Leon, Annemie Maertens and Russell Toth for helpful comments. We are also grateful to Seema Jayachandran and Pinar Keskin for sharing their data with us.

[†]Yale School of Public Health. Email: achyuta.adhvaryu@yale.edu

[‡]Allyn Young Fellow, Dept of Economics, Cornell University. Email: chari@cornell.edu

[§]IFC, World Bank. Email: ssharma@ifc.org

1 Introduction

With a few notable exceptions, most countries have put in place labor regulations governing employment contracts and collective bargaining rights that impose significant costs of separation (see Botero, et al). These costs are also believed by many to be a major impediment to industrial development in poor countries. In terms of the level of employment induced by firing costs, however, economic theory yields ambiguous predictions - the average level of employment may be greater or lower in the presence of firing costs (in fact, Bertola 1990 finds no statistically significant correlation between unemployment and the OECD's index of employment protection). Basu, Fields and Gupta (2009) argue that firing restrictions can either depress or raise wages, depending on parametric conditions.

In contrast, it is unambiguously true that in a stochastic environment, firing costs reduce the extent of employment adjustment to wage and demand shocks: during a downturn, firing costs reduce the number of layoffs, while during an upturn, hiring is curbed because of the possibility of having to lay off workers in the future. The fact that costs of termination provide job security is therefore to be weighed against the reduction in employment opportunities thereby induced. This reduction in employment flexibility also has implications for the profits of firms, and in turn, entry into and growth of the industrial sector. Because labor regulations usually apply only to formal sector firms, this tends to create a bias towards informality, which may well be worse for labor.

In this paper we provide the first (to our knowledge) direct test of the prediction that employment responses to shocks should vary negatively with the degree of employment protection. In general, a test of this prediction requires a setting where there is variation across space and/or time in the extent of employment protection; and a plausible and measurable source of unpredictable, temporary and recurring fluctuations, which in turn should not be caused by employment changes.

Our setting is rural india, where agriculture exists alongside industry. Differences in labor regulation across the states of India (and over time) provide variation in firing costs in the industrial sector. To obtain a plausible shock variable, we measure rainfall fluctuations that affect agricultural yield. In this particular context, rainfall shocks are ideal for a number of reasons: (1) They plausibly give rise to labor supply and/or output demand shifts for local industries via their effect on agricultural yields, (2) they are unpredictable, temporary and recurring, and (3) they are not caused by employment changes in the industrial sector. The empirical strategy is then to test whether these shocks induce larger factory employment responses in states that have enacted pro-employer legislation.

Our results provide a confirmation of the prediction that industrial employment should be more flexible in pro-employer regions. We first confirm that rainfall fluctuations do indeed impact agricultural yields. We then document that high (low) rainfall increases (decreases) industrial employment, indicating the operation of a demand effect via agricultural incomes. Furthermore, as predicted by theory, the induced change in employment is indeed significantly greater in pro-employer states.[1] It also appears that the average change in output and profits is no greater for factories in pro-labor regions, suggesting that they are able to compensate for the lack of employmnt flexibility by adjusting along non-labor margins. Consistent with this hypothesis, we find that adjustment of non-labor inputs in the face of these shocks is indeed greater in pro-labor states.

Because labor regulation is likely to be related to a host of factors, many of which are unobservable, it is possible that our results do not really reflect the effects of labor regulation at all. We attempt to deal with this in two ways: First, we verify the robustness of the results to the inclusion of a set of controls that may be plausibly correlated with labor regulation. Second, we use the institutional features of labor regulation in India: as set down by the Industrial Disputes and Resolution Act of 1947, laws regulating the retrenchment of workers only applied to formal sector establishments employing at least 50 workers. Consistent with this definition of the labor laws, we find that the employment responses to local rainfall shocks in the informal as well as the small-scale factory sector (i.e. factories employing fewer than 50 workers) do *not* vary by the strictness of the labor regime.

If capital is mobile, there may be selection of firms into regions, raising a subtle issue of interpretation. It is not implausible that factories that need to be flexible in their employment may choose to locate in regions with weak employment protection - in this case, the results noted above would reflect this selection, rather than the effect of employment protection on employment responses of the "average" factory. While this interpretation is still consistent with an overall effect of labor regulations, it has different policy implications. Firstly, to the extent that there is indeed selection, we will be exaggerating the effect of firing costs on employment flexibility. Additionally, it may be erroneous to conclude from our results that firms are indifferent to firing restrictions because they can easily adjust other inputs - the true interpretation may be that they are indifferent as long as they have the option of relocating to regions with fewer restrictions. Assuming that the technological substitutability of other inputs for labor is uniform within each industry, one possible way to remove the selection effect may be to compare the employment responses of factories within the same industry that are located in different regions with different labor regimes. This is work in progress.

With these caveats in mind, our results appear to be a striking confirmation of the predictions of the theory. The significance of labor regulation in India was first brought to attention by Besley and Burgess (2004), who showed

[1] A potential complication in this exercise is that rainfall fluctuations create opposing effects on employment: on the one hand, good (bad) rainfall increases (decreases) agricultural incomes and hence demand for local industrial goods, but on the other hand good (bad) rainfall increases (decreases) agricultural demand for labor and represents a negative (positive) labor supply shock for local industry. However, we show in Section 2 that as long as one of the two effects dominates, we should be able to find a differential rate of adjustment across regions.

how employment and output varied with the rigidity of labor regulations. A related study using some of the same data is that of Aghion et al (2008), who document that deregulation of entry into the industrial sector produced differential employment and output responses depending on the degree of employment regulation. A key distinction between their paper and ours is that the shocks considered in our paper are temporary, as would be required to test the dynamic implications of adjustment costs.

Our results also tie into a wider literature that seeks to understand the workings of the rural economy in India, by highlighting the close relation between agricultural and industrial sectors - in particular, our finding of the significance of local demand for the factory sector is surprising, and challenges the frequently-made assumption that the market for formal sector products can be treated as national rather than local. The issue of labor regulation also has particular welfare significance when factors are immobile, which is widely believed to be the case in rural India. For example, Jayachandran (2006) shows that productivity shocks create large changes in the wage when labor is immobile and incomes are near subsistence level. Our results indicate that even though employment adjustment is differential across regimes, profits do not appear to be differentially affected, suggesting that firms may be indifferent to labor regulation, raising the possibility that the latter may even be welfare-improving.

The paper proceeds as follows: Section 2 outlines a theoretical model that confirms the main prediction that will be tested, Section 3 describes the data and the empirical strategy, Section 4 describes the results and Section 5 concludes.

2 Model

We outline here a simple partial-equilibrium model adapted from Cahuc and Zylberberg (2004) that formalizes the key intuition of the paper. The model is set in continuous time. Consider an infinitely-lived price-taking firm that uses only labor to produce its output according to an increasing, concave production function $f(L)$. The firm discounts the future at the constant rate r. There are two possible states of the world, denoted by D (Drought) and F (Flood). Suppose that the state is currently D at time t. The transition to the F state follows a Poisson process with constant rate of arrival θ_D. Similarly the transition from state F to state D is a Poisson process with constant arrival rate θ_F. Hiring workers is frictionless but firing workers is assumed to entail a cost of c per worker - this may be thought of as a severance payment.

In what follows, we will consider a stationary policy for the firm such that the firm employs L_H workers whenever the price is p_H and L_L workers whenever the wage is p_L. We will assume that $p_F > p_D$, corresponding to the assumption that high-rainfall tends to raise demand for the industrial good. The wage rates in the two states are unrestricted, although we may assume without loss of generality that $w_D < w_F$. The price of output and the wage in the different states are also assumed to be such that $L_F > L_D$ (i.e. the demand effect outweighs the wage effect, as will turn out to be true in the data). The choice of L is analogous to investment in an asset whose return is stochastic. Since the policy is stationary, we need only define the value of the asset in the two states of the world, D and F. Let V_D and V_F denote these two values. Given the assumptions on the transition probabilities, we can use the standard equation for the evolution of the price of an asset to write:

$$rV_F = p_F f(L_F) - w_F L_F + \theta_F [V_D - V_F - c(L_F - L_D)]$$

$$rV_D = p_D f(L_D) - w_D L_D + \theta_D [V_F - V_D]$$

Upon transitioning to state D from state F the firm chooses L_D to solve:

$$Max\ V_D - c(L_F - L_D)$$

The first-order condition is simply $\frac{\partial V_D}{\partial L_D} = c$.

On transitioning to state F from state D the firm chooses L_F to solve:

$$Max\ V_F$$

The first-order condition is $\frac{\partial V_F}{\partial L_F} = 0$.

Using the asset-pricing equations, we have:

$$\frac{\partial V_D}{\partial L_D} = \frac{1}{r + \theta_D} [p_D f'(L_D) - w_D + \frac{\partial V_F}{\partial L_D}]$$

$$\frac{\partial V_F}{\partial L_F} = \frac{1}{r + \theta_F} [p_F f'(L_F) - w_F - c\theta_D + \frac{\partial V_D}{\partial L_F}]$$

The first-order conditions, together with the fact that $\frac{\partial V_D}{\partial L_F} = \frac{\partial V_F}{\partial L_D} = 0$ then imply:

$$p_D f'(L_D) = w_D - (r + \theta_D)c$$

$$p_F f'(L_F) = w_F + c\theta_F$$

It is easy to see that an increase in the firing cost c reduces employment in the high-rainfall state (F) and increases employment in the low-rainfall state (D). Put differently, fluctuations represented by rainfall shocks will induce smaller employment adjustments in more regulated environments. This is the hypothesis we will now test.

3 Data and Empirical Strategy

Our empirical analysis examines the effects of labor regulation and rainfall shocks on the industrial sector in 348 Indian districts, using data from three years- 1987, 1990 and 1993. We also look at the informal manufacturing sector of these districts, using data from 1989 and 1994. The districts belong to 16 major states which together account for nearly 95% of India's population.

3.1 Measures of Labor Regulation

The basis of industrial labor regulation in India is the Industrial Disputes Act of 1947, which sets out the conciliation, arbitration and adjudication procedures to be followed in the case of an industrial dispute. The Act was passed by the central government, and applied equally to all states. But since India is a federal democracy, with both the central and state governments having jurisdiction over labor legislation, the act has since been extensively amended by state governments. These amendments have caused the states to differ markedly in their labor regulation.

Besley and Burgess (2004) read all state level amendments made to the Industrial Disputes Act during 1958-1995 in 16 major Indian states (from Malik (1997)). Each amendment was coded as being either pro-worker, neutral, or pro-employer, depending on whether it lowered, left unchanged or increased an employer's flexibility in hiring and firing factory workers. A state's labor regulation regime in any year was then obtained as the sum of these scores over all preceding years. Based on this cumulative score, Besley and Burgess (2004) classified four states- Gujarat, Maharashtra, Orissa and West Bengal- as "pro-worker" in 1988. Six states- Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Rajasthan and Tamil Nadu- were categorized as "pro-employer", leaving six others- Assam, Bihar, Haryana, Jammu and Kashmir, Punjab and Uttar Pradesh- to be classified as "neutral" with respect to labor laws.

We followed this scheme of cumulating the Besley-Burgess scores to categorize the states as *Pro-worker*, *Pro-employer* or *Neutral* in each year of our study. Since there were few labor law amendments after 1987, this classification remains identical to the original Besley-Burgess classification for 1988 throughout our study period. The only exception is Karnataka, which switched from being neutral to being pro-employer between 1987 and 1988.

3.2 Data on the Industrial Sector

India's Factory Act defines a factory as a manufacturing establishment that employs at least 10 workers if it uses power, and at least 20 workers if it does not. These factories constitute the formal industrial sector, and are subject to industrial licensing and labor regulation. The source of our district-level data on factories is the Annual Survey of Industries (ASI), a cross-sectional, geographically comprehensive survey/census of factories which is conducted annually by the Central Statistical Organization of India. The ASI has two sections, the first being a census of all factories employing 100 workers or more, and the second a survey which randomly samples about a quarter of all other registered factories. The combined data from the ASI census and survey sections are representative of all registered factories in India, and can be used to estimate industrial sector aggregates at regional levels by weighting the factory-level data by the inverse of the sampling probabilities. We aggregated primary data from three rounds of the ASI to get district-level estimates of total employment, revenue and value added in factories for the years 1987, 1990 and 1993.

3.3 Data on the Informal Manufacturing Sector

Indian manufacturing enterprises with fewer than ten hired worker belong to the "unorganized" (or "informal") sector, and are not subject to the same industrial licensing or labor laws as registered factories. Our primary data sources on the informal manufacturing sector are National Sample Surveys (NSS) of Unorganized Manufacturing conducted by India's National Sample Survey Organization in 1989 and 1994. These were nation-wide enterprise-level surveys which covered two types of informal enterprises - household enterprises, which are defined as establishments using only family labor, and "small business enterprises", or informal establishments employing hired workers. We aggregated these data to the district-level after weighting the establishment-level numbers by the inverse of the sampling probabilities.[2]

3.4 Rainfall and Agricultural Yields Data

Our data on agricultural yields is from an updated version of the India Agriculture and Climate Data Set, which originally contained district-level agricultural data- including area cultivated, output and prices of major crops-for the years 1957/58 to 1986/87. This data set was compiled by James Robert E. Evenson and James W. McKinsey Jr. using statistics published periodically by the Directorate of Economics and Statistics within the Indian Ministry of Agriculture. We updated these data to 1996 using more recent issues of the same publications.

The rainfall data set, Terrestrial Air Temperature and Precipitation: Monthly and Annual Time Series (1950-99), version 1.02, is from the Center for Climatic Research, University of Delaware. The rainfall measure for a latitude-longitude node (on a 0.5 ° latitude by 0.5° longitude grid) combines data from 20 nearby weather stations using an interpolation algorithm based on the spherical version of Shepard's distance-weighting method. We matched these rainfall data to districts by calculating the grid point nearest to the geographic center of a district.

Previous work in India suggests that while low rainfall is a bad shock to agriculture, excess rainfall is good.[3] Our primary measure of the rainfall shock (*Rainshock*) is constructed accordingly, with higher values indicating *lower* amounts of rainfall. *Rainshock* is equal to one when the annual district rainfall is less than the twentieth percentile of the district's historical average, zero when it is between the twentieth and eightieth percentiles, and minus one when

[2] There are two gaps in our data on the informal sector. First, the 1989 NSS round was limited to household enterprises and to small business enterprises employing at most six hired workers, and did not cover small enterprises hiring 6-10 workers. Second, since we could not match urban establishments to their districts for lack of district identifiers in the 1989 survey, our district data on the unorganized sector cover only those establishments which were located in rural areas. Thus, our data on the informal sector are representative of rural household enterprises and small business enterprises hiring no more than 6 workers. The 1994 Survey of Unorganized Manufacturing indicates that such establishments account for about 85% of all unorganized manufacturing sector employment in rural areas.

[3] See Jayachandran, 2006

it is above the eightieth percentile. We also present results using an alternative, continuous measure of the rainfall shock, which is the negative of the deviation of annual rainfall from the district's historical average, normalized by the historical standard deviation within the district.

3.5 Empirical Strategy

Let $x_{j,t}$ measure an outcome x in district j and year t. We first measure the impact of rainfall shocks on district outcomes by regressing the outcome on a rainfall shock measure ($Rainshock_{jt}$), year dummies (ν_t) and district fixed effects (ρ_j):

$$x_{j,t} = \alpha Rainshock_{jt} + \rho_j + \nu_t + \epsilon_{jt} \tag{1}$$

The coefficient α estimates the average affect of the rainfall shock on the district outcome. Since *Rainshock* is constructed to take on higher values the lower the amount of rainfall, a negative estimate of α would indicate that low rainfall has a negative effect on $x_{j,t}$.

The theory suggests that the industrial sector's response to shocks depends on industrial labor regulation. Hence, our key regressions estimate how the effect of rainfall shocks varies across districts falling under different labor regulation regimes by interacting $Rainshock_{jt}$ with the labor law dummies:

$$\begin{aligned} x_{j,t} &= \alpha Rainshock_{jt} + \beta Rainshock_{jt} * Proworker_{jt} \quad (2) \\ &+ \delta Rainshock_{jt} * Proemployer_{jt} + \rho_j + \nu_t + \epsilon_{jt} \quad (3) \end{aligned}$$

Depending on the cumulated Besley-Burgess labor law index of their state, districts are either *Pro-worker*, *Pro-employer* or *Neutral*. Thus, β and δ measure how the effects of rainfall shocks in *Pro-worker* and *Pro-employer* districts, respectively, differ from that in *Neutral* districts. For example, suppose that the average effect of rainfall shocks, as measured by α, is negative. Then a negative estimate of δ would imply that the decline in $x_{j,t}$ due to low rainfall is greater in *Pro-employer* districts as compared to *Neutral* districts. If α is estimated to be positive, then a negative estimate of δ would imply that relative to *Neutral* districts, the increase in $x_{j,t}$ due to low rainfall is lower in *Pro-employer* districts.

In these regressions, the district fixed effects control for all unobserved district characteristics which do not vary over time, while the year dummies control for time-varying shocks common to all districts. Since the rainfall shock is uncorrelated with other shocks to the district economy, β and δ give unbiased estimates of how the effect of rainfall varies across districts with different labor laws, provided that other district characteristics which affect the response of x_{jt} to rainfall (or the way in which rainfall shocks effect the district economy) are uncorrelated with the labor law dummies.

One concern with this specification is that the impact of rainfall on the district economy depends on the composition of district employment, which might be related to labor regulation. For example, since workers might lobby the govt for pro-worker regulation, states with more formal sector employment are more likely to have enacted pro-worker legislation. Following Jayachandran

(2006), we include the share of agricultural employment and its interaction with rainfall shock as controls. We also include as a control the interaction of the capital intensity of industry in a district (measured by the average capital-output ratio) with the rainfall shock measure.

As a different way to check if our labor regulation measure is picking up the effect of some other local shocks, we exploit the institutional features of labor regulation in India. As per the IDRA, labor laws relating to retrenchment only apply to factories employing at least 50 workers. This provides us with a simple test: If differences in labor regulation (and not some other unobserved shocks) are indeed driving our results, then we should not expect to find any correlation between employment responses and the local labor regime for (1) formal sector factories employing fewer than 50 workers, and (2) informal sector establishments. Therefore, we run the set of regressions above, but this time for the informal sector and the small-scale factory sector (separately).

4 Results

4.1 Main effects of rainfall shocks

We look first at the effects of rainfall shocks on agricultural yields and industrial sector outcomes. We establish that 1) rainfall shocks affect agricultural productivity, and 2) the effects of rainfall shocks on industrial sector outcomes are consistent with the model's predictions of the effects of a demand shock on profit, output, and inputs to production.

We regress district-level agricultural and industrial sector outcomes (y) on shockpctile, the variable representing rainfall shocks. Our unit of observation is district-by-year, and all our specifications include district and year fixed effects. The standard errors are clustered to account for correlation in the error term at the state-by-year level. The results of these regressions are reported in Table 3.

Column 1 of Table 3 shows the effect of rainfall shocks on agricultural yields. As is established by Jayanchandran (2006) and others, we find that rainfall shocks cause a significant impact on yields. The premise of this paper is that this chang in yields has an effect on district incomes, and generates a shift in the demand for the goods produced by the industrial sector.

In the subsequent columns of Table 3, we investigate whether the effects of a rainfall shock are consistent with this premise. Columns 2 and 3 show how the rainfall shock affects industrial labor: we find that the number of workers (though statistically insignificantly) and total man-days employed decreases as a result of the shock. This finding is consistent with the predicted effects of a demand shock: when output demand decreases, labor and other inputs should decrease as well to accommodate the required reduction in output.

Columns 4-6 examine what happens to other inputs into production, namely capital, intermediate materials, and fuel. In Column 4, the dependent variable is the change in capital stock from the open to the close of the business year. We find that this change is not different for years with a rainfall shock. That finding is consistent with most evidence about the fixed nature of capital in the short term: given the large costs of changing the capital stock, we would not expect factories to adjust along this margin to a temporary demand shock.

In Column 5 and 6 of Table 3, we examine the effects of the rainfall shock on intermediate inputs, measured by the materials and fuel used in production. Compared to capital, these inputs are less costly to change; we would therefore expect their usage to decline with a demand shock. Columns 5 and 6 provide evidence that this is the case for materials and fuel (the latter decrease is not statistically significant).

In Columns 7 and 8, we examine the effect of a rainfall shock on output and profits. We examine the effect on output by looking at changes in value added by firms, which is the total value of production minus the value of intermediate inputs (not including labor or capital costs). We find that both value added and profits decline in response to a rainfall shock, consistent with the premise that rainfall shocks induce exogenous decreases in demand for factory goods.

4.2 How does the impact of demand shocks vary by the extent of labor regulation?

In the previous subsection, we established that the effects of a rainfall shock are consistent with the predicted effects of a shock to demand for the goods that the industrial sector produces. In this section, we investigate how these effects vary with the strictness of labor regulation laws, to which the industrial sector is subject.

The theoretical model predicts that since labor regulations impose a cost on hiring and firing employees, firms who are subject to strict regulation should hire and fire fewer laborers in response to demand shocks than firms who face lax regulation. On the other hand, to achieve the necessary change in output, firms under stricter labor laws may adjust more on other margins, such as adjusting intermediate inputs.

We look for empirical evidence for these predictions through regressions that include the interaction of rainfall shocks with the dummies that represent the strictness of state labor regulation laws (and control for the main effects). We use the same rainfall measure as in Table 3, and use dummies for "pro-worker" and "pro-employer" states, as described in the Data section. In Table 4, we report coefficients of the main effect of rainfall shocks, and the effects of rainfall shocks interacted with the labor regulation dummies, for the same outcome variables used in Table 3. The main effect of the pro-worker dummy is absorbed by the district fixed effects. The coefficient on the main effect of the pro-employer dummy is identified, because Karnataka changes from neutral to pro-employer during the period covered in our data, but not reported in the table.

In Column 1 of Table 4, we verify that the rainfall shock does not differentially affect crop yields in pro-worker and pro-employer states. The results of an F-test (reported in the table) for the difference between the coefficients on the interaction terms show that we cannot reject the hypothesis that the effect of a rainfall shock is the same across pro-worker and pro-employer states. If this relationship had been different across pro-worker and pro-employer states, interpreting differences in the effects of rainfall shocks on industrial sector outcomes across the two types of states would have more difficult.

In Columns 2 and 3, we examine the effects of the demand shock on labor outcomes in the industrial sector. For both the number of workers and man-days employed, the interaction coefficient for pro-employer states is significantly less than the coefficient on the pro-worker interaction, as the F-tests reported below the estimates show. This finding indicates that, consistent with the predictions of theoretical model, we see a differentially larger decline in workers and man-days in response to a demand shock in pro-employer states. In addition, the decline in pro-worker states is not significantly different from zero. Both facts provide evidence that stricter labor regulation imposes greater costs to firing, which hamper the adjustment of labor to demand shocks for firms, but facilitate more stable employment for workers.

In Columns 4-6, we examine the effect of rainfall shocks on other inputs to production, namely capital and intermediate inputs. We find, consistent with Table 3, that the effect of rainfall shocks on capital (Column 4) is negligible in both pro-worker and pro-employer states. Again, we would expect this result given the high costs to short-term adjustment of capital stock. In contrast, in Columns 5 and 6, we find an interesting pattern when comparing the response of intermediate inputs (materials and fuel, respectively) to rainfall shocks in the two types of states. We find that both intermediate inputs respond negatively to rainfall shocks, but both inputs decline significantly more in pro-worker states. This finding is consistent with the prediction that if costs to labor adjustment are higher, firms will bring about the required decrease in output by decreasing other inputs by more intensively. The F-tests reported in Columns 5 and 6 provide empirical evidence for that prediction.

In Columns 7 and 8, we show that while output (measured by value added) and profits decline in response to rainfall shocks, that decline is not different across pro-worker and pro-employer states. This result is consistent with the fact that a negative demand shock should induce the same decrease in production regardless of differential costs of adjustment for one input, if there are other margins on which firms can adjust.

In table 6, we repeat these regressions, controlling for interactions between the percentage of the economy that is agrarian, the capital intensity of industry and rainfall shocks. The results remain robust to the inclusion of these controls, giving us confidence that we are indeed picking up the effect of labor regulations.

4.3 Effect of rainfall shocks on informal sector employment

We have shown, with the evidence presented in Tables 3 and 4, that the effects of a rainfall shock are consistent with the predictions of our theoretical model with regard to the effects of a shock to demand in the industrial sector. Further, our results show that the demand shock response varies across states with stricter or laxer labor regulation laws, in a way that is consistent with the fact that the regulation imposes an adjustment cost on firms.

In this section, we address the fact that the rainfall shock may induce labor supply effects alongside the demand-side effects we have focused on so far. In particular, Jayachandran (2006) provides evidence that rainfall shocks decrease the agricultural wage through their effect on crop yields. This wage decrease in the agricultural sector should increase the labor supply in other sectors to which agricultural laborers have access.

We provide evidence in Tables 3 and 4 that even if agricultural laborers could switch into industrial sector labor following a drop in the agricultural wage, this supply-side effect is dominated by the demand-side effect generated by the decrease in demand. In Table 5, we show that the opposite is the case for the informal sector, comprised of household enterprises and small enterprises (definitions of these sub-sectors are provided in the Data section). Columns 1 and 3 examine the effects of a rainfall shock on the number of workers in these two sectors. We find a large and significant positive effect of a rainfall shock for household enterprises, and similar positive but insignificant effect for small enterprises.

These findings are consistent with the explanation that switching from farming to household enterprise in response to a wage shock likely involves the least cost to the worker; searching for work in a small enterprise or a factory would likely involve a greater cost. In the next draft of this paper, we will look for evidence of this explanation using data on the percent of a district's agricultural workers who are landless versus landed. Jayachandran (2006) makes the argument that landless workers are more mobile than landed workers, since the latter are tied to their land. Thus, we should expect that in districts with a greater proportion of landless workers, the labor supply effects across sectors in response to a rainfall shock should be greater.

In Columns 2 and 4, we look for differences in the labor responses in the informal sector by strictness of industrial sector labor regulation. We find little evidence of significant differences: the F-test for the difference between the two interaction coefficients is insignificant for household enterprises and marginally significant for small enterprises. The argument that more lax industrial sector labor regulation, which leads to more firing in the face of demand shocks, could induce a number of those workers to migrate to the informal sector, does not appear to hold empirically. This, together with the fact that the demand response dominates any labor supply effect in the industrial sector, leads us to speculate that switching into and out of the industrial sector in response to shocks is limited by the costs of job search or migration.

4.4 Effect of rainfall shocks on small- and large-scale sectors

In the previous subsection, we found that employment responses in the unregulated informal sector did not vary with the strictness of the labor regime, as we would have expected. We now perform an additional check, using the fact that factories employing fewer than 50 workers were not subject to labor regulation. To implement this check, we split the formal sector into small- and large-scale sectors and run the regressions for each group separately. The results are reported in Tables 7 through 10.

The results are striking: Rainfall shocks have similar effects on employment in small and large scale sectors, indicating that rainfall affects these two sectors via the same channels. More importantly, from our point of view, the results show that the employment response aries with the strictness of labor regulation only for the large-scale sector, whereas there is no differential response in the small-scale sector. Again, this makes us confident that the labor regulation variable is not picking up the effect of some other correlated factor.

5 Conclusion

Theoretical models of labor demand predict that firing costs have ambiguous effects on employment levels. In contrast, firing costs are predicted to unambiguously reduce the size of employment responses to wage and output price shocks. We provide the first test of this sharp prediction, exploiting a setting which exhibits variation in labor regulation as well as exogenous wage and price shocks. Our setting is rural India, where rainfall fluctuations create demand and wage shocks for local industries, and where labor regulation varies temporally as well as spatially. Preliminary results provide a striking confirmation of the theory - rainfall shocks change industrial employment by shifting the demand for industrial products, and the employment adjustment is more pronounced in regions where labor regulations are less restrictive. Furthermore, in areas with stricter labor regulations, the output change is achieved by adjusting non-labor inputs.

Understanding firms' abilities to adjust to shocks, and the effects that these adjustments have on workers, is crucial to forming appropriate labor regulation policy. Our results show that labor regulation laws significantly change the way in which the industrial sector adjusts to shocks. In turn, these changes affect the vulnerability of workers to demand shocks: we find that where labor regulation is stricter, workers are more protected from the effects of the shocks. Moreover, we find that factories cope with stricter labor regulation by adjusting more on other margins in response to shocks, and suffer no greater loss in output and profits than firms in places with less strict regulation. This finding suggests that when adjustment along other margins is possible, labor regulation, at least in its role with regard to adjusting to shocks, may be Pareto-improving. Workers are more protected from the adverse affects of the shock, and firms are no worse off if they are able to adjust on other margins.

References

Aghion, P., R. Burgess, S. Redding, and F. Zilibotti. 2005. "Entry Liberalization and Inequality in Industrial Performance", *Journal of the European Economic Association* 3(2-3).

Aghion, P., R. Burgess, S. Redding, and F. Zilibotti. 2008. "The Unequal Effects of Liberalization: Evidence from Dismantling the License Raj in India", *American Economic Review* 98 (4).

Besley, T. and R. Burgess (2004). "Can labour regulation hinder economic performance: Evidence from India", *Quarterly Journal of Economics* 119 (1).

Botero, J., S. Djankov, R. L. Porta, F. L. de Silanes, and A. Shleifer (2004). The regulation of labor. *Quarterly Journal of Economics* 119 (4).

Bentolila, S. and Saint-Paul, G. 1994. "A Model of Labor Demand with Linear Adjustment Costs", *Labor Economics*, 1, pp. 303-326

Bertola, G. 1990. "Job Security, Employment and Wages", *European Economic Review*, 34, pp. 851-86.

Cahuc, P. and A. Zylberberg, 2004. *Labor Economics*, MIT Press, Cambridge.

Jayachandran, S. 2006, "Selling Labor Low: Wage Responses to Productivity Shocks in Developing Countries", *Journal of Political Economy*, vol. 114 (3), pp. 538-575.

Table 1: Summary statistics by pro-worker, neutral and pro-employer states

	Pro-worker	*Neutral*	*Pro-employer*
Agricultural yield	268.77	269.72	324.70
	(157.96)	(119.63)	(201.97)
Industrial sector outcomes:			
Number of workers	18656.91	8806.28	17365.11
	(25237.00)	(14086.25)	(21899.32)
Man-days (thousands)	7453.67	3429.88	6373.00
	(10254.04)	(5836.59)	(8036.04)
Change in capital stock	37.72	12.24	22.29
	(88.80)	(46.40)	(59.28)
Materials (intermediate input)	528.57	253.60	388.78
	(775.39)	(463.95)	(571.72)
Fuel	59.87	25.12	44.09
	(86.03)	(44.06)	(58.77)
Value added	150.07	71.51	110.20
	(250.17)	(146.71)	(171.78)
Profits	27.48	20.57	28.74
	(96.05)	(58.38)	(82.05)
Informal sector outcomes:			
Number of workers in household	43268.08	23640.54	32710.76
enterprises	(48009.69)	(28046.24)	(31398.57)
Number of workers in small	4861.61	2427.58	5386.67
enterprises	(6508.92)	(3836.21)	(6570.22)

Notes: state classifications are based on adding the number of pro-worker laws and subtracting the number of pro-employer laws passed in each state; for details, please refer to the Data section; please also refer to the Data section for data sources and more detailed definitions; change in capital stock, materials, fuel, value added and profits have been converted to thousands of 2009 US dollars

Table 2: Pro-worker, pro-employer and neutral states in our sample

Pro-worker	*Pro-employer*	*Neutral*
Gujarat	Andhra Pradesh	Bihar
Maharashtra	Karnataka*	Haryana
Orissa	Rajasthan	Karnataka*
West Bengal	Tamil Nadu	Madhya Pradesh
		Punjab
		Uttar Pradesh

Notes: (*) Karnataka switches from neutral to pro-employer in 1987-88; classifications are based on adding the number of pro-worker laws and subtracting the number of pro-employer laws passed in each state; for details, please refer to the Data section

Table 3: Effect of rainfall shock on agricultural and industrial sector activity

Dependent variables:	Yield	*Industrial sector outcomes:* Number of workers	Man-days (thousands)	Change in capital	Materials	Fuel	Value added	Profits
Rainfall shock	-15.53**	-436.22	-198.82*	2.25	-21.31*	-1.67	-7.47*	-8.19***
	(6.95)	(279.23)	(108.38)	(3.74)	(11.01)	(1.50)	(3.85)	(2.68)
District fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Number of observations	773	1,032	1,031	1,032	1,031	1,031	1,031	1,031

Notes: *** p<0.01; ** p<0.05; * p<0.1; robust standard errors are reported in parentheses below the coefficient estimates and allow for clustering within state-year; "Yield" is output per area cropped (see Data section for details); "Rainfall shock" = 1 if annual rainfall is less than 20th percentile of district's historical average; = 0 if between 20th and 80th percentiles; and = -1 if above 80th percentile; "Change in capital stock" is the difference between capital stock at close and opening of business year; "Materials" and "Fuel" are annual values of intermediate inputs used; "Value added" is the pecuniary value of total output minus intermediate inputs; all dependent variables are trimmed at the 99th percentile of their distributions to remove outliers; dependent variables in columns 4-8 have been converted to thousands of 2009 US dollars.

Table 4: Effect of rainfall shock on industrial sector activity, by strictness of labor regulation

		Industrial sector outcomes:						
Dependent variables:	Yield	Number of workers	Man-days (thousands)	Change in capital	Materials	Fuel	Value added	Profits
Rainfall shock	-4.21	-88.50	-101.78	1.30	-22.19**	-2.14*	-11.81***	-7.46***
	(6.62)	(237.45)	(93.03)	(3.70)	(11.12)	(1.27)	(3.90)	(2.50)
Rainfall shock x								
Pro-worker state	-28.89**	262.53	103.58	10.88	-37.06	-3.11	13.94*	-3.14
	(13.06)	(470.55)	(180.14)	(9.21)	(28.50)	(2.55)	(7.83)	(5.98)
Pro-employer state	-21.37**	-1,578.17**	-456.38*	-4.18	30.38*	4.17	7.30	-0.79
	(8.37)	(698.46)	(246.10)	(5.08)	(16.94)	(3.89)	(6.22)	(5.83)
District fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Test for difference between	-7.52	1,840.70	559.96	15.06	-67.44	-7.28	6.64	-2.35
interaction coefficients	(15.75)	(814.41)**	(298.07)*	(10.05)	(30.66)**	(4.17)*	(9.64)	(8.34)
Number of observations	773	1,032	1,031	1,032	1,031	1,031	1,031	1,031

Notes: *** p<0.01; ** p<0.05; * p<0.1; robust standard errors are reported in parentheses below the coefficient estimates and allow for clustering within state-year; "Yield" is output per area cropped (see Data section for details); "Rainfall shock" = 1 if annual rainfall is less than 20th percentile of district's historical average; = 0 if between 20th and 80th percentiles; and = -1 if above 80th percentile; "Change in capital stock" is the difference between capital stock at close and opening of business year; "Materials" and "Fuel" are annual values of intermediate inputs used; "Value added" is the pecuniary value of total output minus intermediate inputs; all dependent variables are trimmed at the 99th percentile of their distributions to remove outliers; dependent variables in columns 4-8 have been converted to thousands of 2009 US dollars; dummy for pro-worker state (main effect) is absorbed by district FE; coefficient on dummy for pro-employer state is identified as Karnataka has variation in labor strictness over time (coefficient not reported).

Table 5: Effect of rainfall shock on informal sectors

Dependent variable is number of workers in given industry	Household enterprises		Small business enterprises	
Rainfall shock	5,196.75**	6,704.07***	391.72	411.72
	(2,215.29)	(2,599.39)	(289.43)	(437.89)
Rainfall shock interacted with				
Dummy for pro-worker state		1,029.61		828.52
		(11,015.53)		(686.71)
Dummy for pro-employer state		-5,165.85		-417.65
		(3,419.66)		(600.27)
District fixed effects?	yes	yes	yes	yes
Year fixed effects?	yes	yes	yes	yes
Test for difference between interaction coefficients		6,195.46		1,246.18
		(10968.04)		(665.77)*
Number of observations	693	693	693	693

Notes: *** p<0.01; ** p<0.05; * p<0.1; robust standard errors are reported in parentheses below the coefficient estimates and allow for clustering within state-year; "Rainfall shock" = 1 if annual rainfall is less than 20th percentile of district's historical average; = 0 if between 20th and 80th percentiles; and = -1 if above 80th percentile; all dependent variables are trimmed at the 99th percentile of their distributions to remove outliers; dummy for pro-worker state (main effect) is absorbed by district FE; coefficient on dummy for pro-employer state is identified as Karnataka has variation in labor strictness over time (coefficient not reported).

Table 6: Effect of rainfall shock on industrial sector activity, by strictness of labor regulation

		Industrial sector outcomes:						
Dependent variables:	Yield	Number of workers	Man-days (thousands)	Capital	Materials	Fuel	Value Added	Profits
Rainfall shock	-10.91	-55.39	-144.64	-42.67*	-78.62**	0.95	-17.47	-14.65**
	(12.11)	(810.91)	(321.01)	(21.43)	(36.17)	(4.08)	(11.37)	(6.18)
Rainfall shock x								
Pro-worker state	-33.32**	628.10	219.64	-4.88	-21.27	-4.44	21.42**	0.90
	(14.74)	(536.01)	(212.71)	(14.34)	(28.95)	(2.71)	(8.26)	(7.10)
Pro-employer state	-22.97**	-1,516.02**	-441.54*	34.49***	31.36	4.03	9.58	0.37
	(9.13)	(644.47)	(239.12)	(11.44)	(19.67)	(3.39)	(5.89)	(5.28)
% workers in district	0.09	20.11	6.87	0.54	1.21*	-0.07	0.15	0.09
who are landed	(0.30)	(17.83)	(6.82)	(0.46)	(0.71)	(0.08)	(0.19)	(0.13)
% workers in district	0.45	-21.65	-6.11	-0.68	-0.58	0.10	-0.58**	-0.32
who are landless	(0.27)	(15.39)	(5.95)	(0.51)	(0.75)	(0.11)	(0.23)	(0.22)
Average capital-to-	0.32	-86.97	-35.44	-1.40	1.19	-0.94*	-1.67**	-0.46
output ratio in district	(0.85)	(79.27)	(31.42)	(1.66)	(2.91)	(0.51)	(0.77)	(0.36)
% empl. in industries	-0.07	-4.55	-0.56	0.42*	0.61*	-0.03	0.25***	0.21**
linked to agriculture	(0.08)	(7.65)	(2.64)	(0.23)	(0.35)	(0.05)	(0.08)	(0.08)
District fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Test for difference between	-10.35	2144	661.2	-39.37	-52.62	-8.471	11.83	0.525
interaction coefficients	(18.69)	(750.20)***	(298.40)**	(17.37)**	(32.27)	(4.37)*	(9.87)	(9.52)
Number of observations	755	1,008	1,007	1,008	1,007	1,007	1,007	1,007

Notes: *** p<0.01; ** p<0.05; * p<0.1; robust standard errors are reported in parentheses below the coefficient estimates and allow for clustering within state-year; "Yield" is output per area cropped (see Data section for details); "Rainfall shock" = 1 if annual rainfall is less than 20th percentile of district's historical average; = 0 if between 20th and 80th percentiles; and = -1 if above 80th percentile; "Capital" is the value of fixed capital stock at close of business year; "Materials" and "Fuel" are annual values of intermediate inputs used; "Value added" is the pecuniary value of total output minus intermediate inputs; all dependent variables are trimmed at the 99th percentile of their distributions to remove outliers; dependent variables in columns 4-8 have been converted to thousands of 2009 US dollars; dummy for pro-worker state (main effect) is absorbed by district FE; coefficient on dummy for pro-employer state is identified as Karnataka has variation in labor strictness over time (coefficient not reported).

Table 7: Effect of rainfall shock on agricultural and industrial sector activity for small factories

		Industrial sector outcomes:						
Dependent variables:	Yield	Number of workers	Man-days (thousands)	Capital stock	Materials	Fuel	Value added	Profits
Rainfall shock	-16.83**	-438.97***	-134.84**	-2.95***	-14.49***	-1.16***	-2.89***	-1.07**
	(6.92)	(150.15)	(54.69)	(1.05)	(4.09)	(0.26)	(0.89)	(0.48)
District fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Number of observations	762	1,012	1,013	1,013	1,012	1,013	1,013	1,013

Notes: *** p<0.01; ** p<0.05; * p<0.1; robust standard errors are reported in parentheses below the coefficient estimates and allow for clustering within state-year; "Yield" is output per area cropped (see Data section for details); "Rainfall shock" = 1 if annual rainfall is less than 20th percentile of district's historical average; = 0 if between 20th and 80th percentiles; and = -1 if above 80th percentile; "Capital stock" is the value of fixed capital stock at opening of business year; "Materials" and "Fuel" are annual values of intermediate inputs used; "Value added" is the pecuniary value of total output minus intermediate inputs; all dependent variables are trimmed at the 99th percentile of their distributions to remove outliers; dependent variables in columns 4-8 have been converted to thousands of 2009 US dollars.

Table 8: Effect of rainfall shock on industrial sector activity, by strictness of labor regulation, for small factories

		Industrial sector outcomes:						
Dependent variables:	Yield	Number of workers	Man-days (thousands)	Capital stock	Materials	Fuel	Value added	Profits
Rainfall shock	-12.15	-1,208.76***	-401.95***	-5.87***	-28.03***	-2.72***	-7.89***	-2.92**
	(11.76)	(305.20)	(113.61)	(2.11)	(8.61)	(0.63)	(2.28)	(1.39)
Rainfall shock x								
Pro-worker state	-33.28**	373.68	94.95	-3.60	0.51	0.26	-0.39	-0.84
	(14.65)	(354.01)	(129.34)	(3.17)	(12.37)	(0.77)	(2.73)	(1.39)
Pro-employer state	-23.11**	-50.18	-15.25	0.55	6.84	0.19	0.86	0.22
	(9.17)	(303.61)	(91.93)	(1.12)	(6.64)	(0.33)	(1.44)	(0.85)
% workers in district	0.09	23.33***	7.08***	0.09**	0.30*	0.04***	0.10**	0.02
who are landed	(0.30)	(6.24)	(1.99)	(0.04)	(0.17)	(0.01)	(0.04)	(0.02)
% workers in district	0.43	-15.63*	-5.39**	-0.08**	-0.44**	-0.01	-0.05	0.01
who are landless	(0.29)	(7.81)	(2.61)	(0.04)	(0.20)	(0.01)	(0.04)	(0.03)
Average capital-to-	0.32	-2.23	-0.93	0.02	0.51	0.00	0.12	0.04
output ratio in district	(0.88)	(13.42)	(5.56)	(0.22)	(0.54)	(0.04)	(0.13)	(0.09)
% empl. in industries	-0.06	7.33**	3.32***	0.05**	0.23**	0.01**	0.07***	0.02**
linked to agriculture	(0.08)	(2.89)	(1.11)	(0.03)	(0.11)	(0.01)	(0.02)	(0.01)
District fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Test for difference between	-10.17	423.9	110.2	-4.153	-6.327	0.0747	-1.250	-1.065
interaction coefficients	(18.47)	(496.30)	(163.00)	(3.35)	(13.45)	(0.85)	(2.92)	(1.39)
Number of observations	744	988	989	989	988	989	989	989

Notes: *** p<0.01; ** p<0.05; * p<0.1; robust standard errors are reported in parentheses below the coefficient estimates and allow for clustering within state-year; "Yield" is output per area cropped (see Data section for details); "Rainfall shock" = 1 if annual rainfall is less than 20th percentile of district's historical average; = 0 if between 20th and 80th percentiles; and = -1 if above 80th percentile; "Capital stock" is the value of fixed capital stock at opening of business year; "Materials" and "Fuel" are annual values of intermediate inputs used; "Value added" is the pecuniary value of total output minus intermediate inputs; all dependent variables are trimmed at the 99th percentile of their distributions to remove outliers; dependent variables in columns 4-8 have been converted to thousands of 2009 US dollars; dummy for pro-worker state (main effect) is absorbed by district FE; coefficient on dummy for pro-employer state is identified as Karnataka has variation in labor strictness over time (coefficient not reported).

Table 9: Effect of rainfall shock on agricultural and industrial sector activity for large factories

		Industrial sector outcomes:						
Dependent variables:	Yield	Number of workers	Man-days (thousands)	Capital stock	Materials	Fuel	Value added	Profits
Rainfall shock	-15.85**	-53.72	-44.84	-9.72*	-4.44	-1.31	-7.91**	-6.19**
	(7.14)	(282.48)	(98.97)	(5.67)	(10.61)	(1.19)	(3.77)	(3.07)
District fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Number of observations	745	976	976	976	977	976	976	977

Notes: *** p<0.01; ** p<0.05; * p<0.1; robust standard errors are reported in parentheses below the coefficient estimates and allow for clustering within state-year; "Yield" is output per area cropped (see Data section for details); "Rainfall shock" = 1 if annual rainfall is less than 20th percentile of district's historical average; = 0 if between 20th and 80th percentiles; and = -1 if above 80th percentile; "Capital stock" is the value of fixed capital stock at opening of business year; "Materials" and "Fuel" are annual values of intermediate inputs used; "Value added" is the pecuniary value of total output minus intermediate inputs; all dependent variables are trimmed at the 99th percentile of their distributions to remove outliers; dependent variables in columns 4-8 have been converted to thousands of 2009 US dollars.

Table 10: Effect of rainfall shock on industrial sector activity, by strictness of labor regulation, for large factories

		Industrial sector outcomes:						
Dependent variables:	Yield	Number of workers	Man-days (thousands)	Capital stock	Materials	Fuel	Value added	Profits
Rainfall shock	-12.62	1,124.76	296.61	-35.32*	-37.36	3.42	-21.73**	-11.36*
	(11.39)	(872.26)	(310.62)	(20.82)	(33.35)	(4.12)	(9.26)	(6.48)
Rainfall shock x								
Pro-worker state	-33.65**	271.98	137.87	-0.40	-27.85	-4.37	16.93**	4.44
	(15.35)	(545.89)	(190.77)	(12.00)	(20.80)	(2.69)	(8.18)	(6.54)
Pro-employer state	-24.85**	-1,580.27***	-433.36**	36.25***	21.72	1.11	6.28	4.59
	(9.81)	(531.33)	(175.67)	(12.16)	(20.52)	(2.21)	(6.16)	(4.86)
% workers in district	0.15	-1.19	-0.10	0.43	0.89	-0.10	0.34	0.06
who are landed	(0.31)	(17.33)	(6.01)	(0.46)	(0.63)	(0.08)	(0.20)	(0.13)
% workers in district	0.61**	-4.69	0.22	-0.76	-1.20	0.03	-0.64***	-0.47**
who are landless	(0.26)	(16.91)	(6.30)	(0.52)	(0.78)	(0.10)	(0.23)	(0.22)
Average capital-to-	0.05	-91.41	-37.16	-1.16	1.41	-0.87*	-1.44*	-0.49
output ratio in district	(0.88)	(78.93)	(31.47)	(1.52)	(2.67)	(0.51)	(0.75)	(0.38)
% empl. in industries	-0.11	-13.04	-4.58*	0.41*	0.59*	-0.02	0.28***	0.23***
linked to agriculture	(0.10)	(8.29)	(2.58)	(0.22)	(0.33)	(0.04)	(0.09)	(0.08)
District fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effects?	yes	yes	yes	yes	yes	yes	yes	yes
Test for difference between	-8.805	1852	571.2	-36.65	-49.57	-5.478	10.65	-0.147
interaction coefficients	(19.39)	(503.10)***	(175.00)***	(15.71)**	(22.20)**	(3.25)*	(9.90)	(7.94)
Number of observations	731	956	956	956	957	956	956	957

Notes: *** p<0.01; ** p<0.05; * p<0.1; robust standard errors are reported in parentheses below the coefficient estimates and allow for clustering within state-year; "Yield" is output per area cropped (see Data section for details); "Rainfall shock" = 1 if annual rainfall is less than 20th percentile of district's historical average; = 0 if between 20th and 80th percentiles; and = -1 if above 80th percentile; "Capital stock" is the value of fixed capital stock at opening of business year; "Materials" and "Fuel" are annual values of intermediate inputs used; "Value added" is the pecuniary value of total output minus intermediate inputs; all dependent variables are trimmed at the 99th percentile of their distributions to remove outliers; dependent variables in columns 4-8 have been converted to thousands of 2009 US dollars; dummy for pro-worker state (main effect) is absorbed by district FE; coefficient on dummy for pro-employer state is identified as Karnataka has variation in labor strictness over time (coefficient not reported).