

Entry Regulation, Labor Laws and Informality*

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Abstract

This paper examines how industrial entry regulation and labor laws affect informality, using district-level panel data on informal manufacturing enterprises in India. A major policy reform in 1991 removed license controls on the setup and expansion of factories in several industries. Variation in the pre-reform size of deregulated industries across districts within states, and in labor laws across states allow for a differences in differences approach to measuring how the impact of this reform on informality depended on labor regulation. The paper finds that following this reform, the informal sector contracted to a greater extent in states with more flexible labor laws. The associated increase in value added per worker in manufacturing too was larger in these states. These findings suggest that entry deregulation can lead to productivity-enhancing labor reallocation from the informal to the formal sector, if labor laws are flexible.

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1 Introduction

Informality is endemic to firms in developing countries. It is estimated, for example, that 50-60% of the Columbian labor force is employed in the informal sector (Goldberg and Pavcnik (2003)), and that more than 80% of industrial employment in India is in unregistered establishments. This informality is associated with markedly lower productivity: for instance, value added per worker in India's informal manufacturing sector is on average about one tenth that in the formal sector.¹ It is often asserted that despite these large productivity gaps, firms choose to stay informal in order to avoid the burden of regulation on formal firms, or because regulations make entry into the formal sector expensive.² Consistent with this view, cross-country investigation reveals that informality is more prevalent in economies with greater entry regulation and rigid labor laws (Djankov et al. (2002), Djankov and Ramalho (2008)). This view implies that a lowering of entry barriers to firms will reduce informality.

A contrasting view is that since there might be complementarities between these sectors, entry in the formal sector will expand employment and average returns in the informal sector. For example, it is possible that the two sectors produce complementary products, with vertical contracting enabling informal enterprises to access a larger market. Another possibility is that when faced with greater competition, large firms try to escape labor regulations by contracting out work to the informal sector (Ramaswamy (1999)). Goldberg and Pavcnik (2003) argue that such an expansion of the informal sector occurred in Columbia when following trade liberalization, domestic industry was subjected to greater external competition.

In this paper, I use data from three nationally-representative, establishment-level surveys of India's informal manufacturing sector to present new microeconomic evidence linking informality to entry barriers and labor regulation. A wave of industrial deregulation in 1991 exempted nearly half of all industries in India from onerous licensing requirements on the setup and expansion of registered manufacturing enterprises ("factories"). I examine the impact of this delicensing on the informal manufacturing sector, comparing it across regions that differ in the rigidity of labor laws which apply to factories.

I first show that the informal sector contracted significantly after this removal of entry barriers, across all industries, but to a greater degree in states with more flexible labor laws. The estimates indicate that after deregulation, the decline in the number of informal

¹Estimates based on NSSO (2001) and CSO (2001).

²Johnson et al. (1998), Kochar et al. (2006))

enterprises was 23% greater in states with pro-employer labor laws, compared to other states.

While this finding suggests that reduced entry barriers discourage informality, and to a greater extent when labor regulations applying to formal firms are less rigid, it is possible that it reflects unobserved state-specific shocks unrelated to delicensing. Hence, to better identify the differential impact of delicensing, I turn to geographically finer district-level data and employ a differences in differences approach. The empirical strategy exploits an exogenous, district-level source of variation in the size of the “delicensing shock”, namely the pre-1991 size of the delicensed factory sector in the district.

Districts having more delicensed factories before the reform would have experienced a stronger delicensing shock to their informal sector because of two reasons. First, the most likely immediate impact of easing entry and expansion controls on factories is an expansion of existing factories. Second, it is a well-established fact that since labor is spatially immobile in India, labor market shocks in one sector of a district affect other sectors of that district’s economy.³

So, controlling for state-specific shocks, I relate informality before and after 1991 to differences in the pre-reform size of delicensed industries across districts, and examine how this relationship depended on labor laws. My main finding is that relative to other states, this relationship was significantly more negative in districts located in states with pro-employer labor laws. This shows that the district delicensing shock caused a relatively larger contraction in informality in areas with more flexible labor laws.

In contrast to the informal sector, the relationship between the pre-reform size of the delicensed sector and post-1991 growth in formal manufacturing was positive in pro-employer states as compared to other states. This result confirms the assumption behind the identification strategy, and is consistent with previous studies on the effect of delicensing on India’s formal industrial sector (Aghion et al. (2008)). Together, these results on informal and formal establishments show that compared to other states, delicensing reallocated workers from informal establishments to registered factories in states with pro-employer labor laws. The data also show that delicensing increased value added per worker in the factory sector in these states, relative to others. Thus, average value added per worker in the manufacturing sector increased more in states with more flexible labor laws. These findings suggest that entry deregulation can decrease informality and increase average returns if laws governing

³Munshi and Rosenzweig (2005) and Jayachandran (2006).

hiring and firing in formal enterprises are sufficiently flexible.

Current evidence linking regulation and informality is based largely on cross-sectional inference (Djankov and Ramalho (2008), Botero et al. (2004)), and is therefore subject to concerns of endogeneity caused by correlations between regulation and unobserved determinants of informality. To give an example, both informality and heavy industrial regulation could be linked to some third institutional feature of underdevelopment. This study controls for such time-invariant, unobserved correlates by focussing on identifying the *changes* in informality, in response to a change in regulation. Moreover, the strategy of comparing this change across districts within states ensures that the results do not reflect other macroeconomic or state-level shocks to the informal sector. To my knowledge, this empirical strategy is a first in the research on informality. I also verify that the results are not being driven by geographically divergent trends in manufacturing by showing that the differential in growth before and after delicensing dampened over time.

Besides contributing to the literature on informality, this paper adds to the growing body of microeconomic evidence on the effects of lowering entry barriers to firms in developing countries. Recent studies have shown that such entry barriers hurt growth through their effect on the size and composition of investment. Looking at the impact of India's industrial delicensing on the formal manufacturing sector, Chari (2008) finds that the growth caused by this deregulation was due, in equal parts, to an immediate expansion in existing factories, and to the registration of new factories in the longer run. In similar work on Mexico, Kaplan et al. (2007) and Bruhn (2008) take advantage of the phased roll-out of a business registry simplification program (*SARE*) to identify sizable positive effects of the reform on job and firm creation.

Studies such as these have been ambivalent about how much of the recorded entry into manufacturing is simply a migration of firms from the informal to the formal manufacturing sector. Kaplan et al. (2007) find that the new firms being registered are larger, suggesting perhaps that these firms may have been operating informally, and that the effect of the new reform was simply to change their incentive to formalize. In contrast, Bruhn (2008) argues that the increase in the number of new businesses came primarily from former wage earners. This paper presents direct evidence that deregulation leads to exits from the informal sector, which can help interpret these previous findings. It also suggests that focussing on "entry" in the formal sector could give a biased estimate of the *net* effect of entry deregulation on

industrial employment.

This paper is also related to recent work on the effect of labor regulations on growth. In a prominent study, Besley and Burgess (2004) exploit the fact that amendments to India's industrial labor law have differed significantly across Indian states, and find that pro-rigidity amendments to labor law are associated with lowered growth in registered manufacturing. Aghion et al. (2008) use data on India's registered factories to show that compared to states with neutral labor laws, industrial delicensing had a positive effect on delicensed formal industries in pro-employer states. My results complement these findings, showing that exit from informality was a significant source of the relative growth in the formal sector of pro-employer states.

Since it shows that in combination with regional variation in labor laws, deregulation caused an increase in regional inequality in informal labor productivity, this study is also relevant to understanding rising spatial inequality in large developing countries (Sachs et al. (2002), Cashin and Sahay (1996), Dasgupta et al. (2000), Demurger (2004)). It belongs, in particular, to that strand of this literature which studies how factor immobility and institutional differences lead to regionally heterogeneous impacts of policy reforms (Topalova (2004), Sharma (2009), Aghion et al. (2005)).

The rest of this paper is organized as follows. Section 2 gives a brief description of India's industrial licensing system, and of labor regulation across Indian states. Section 3 contains a model which illustrates the mechanisms through which large-scale delicensing is expected to affect the unorganized manufacturing sector. Section 4 describes the empirical specification and Section 5, the data sources. Sections 6 and 7 present the estimation results, and Section 8 concludes.

2 Institutional Background

2.1 The Industrial Licensing Regime in India

The industrial licensing system, introduced in the 1951 Industries Act, was the principal tool used by the Indian government to control the pace and pattern of industrial development across India (N.C.A.E.R (2001)). An industrial license was necessary to (i) establish a new factory, (ii) carry on business in an existing unlicensed factory (iii) significantly expand an

existing factory's capacity, (iv) start a new product line and (iv) change location. All manufacturing units in the "organized" sector⁴ were subject to these licensing requirements. As described in Aghion et al. (2008), these licensing requirements

"...imposed a substantial administrative burden on firms. There was also considerable uncertainty as to whether license applications would be approved and within what time frame... Delays in the approval process were common and of indeterminate length. No explicit criteria for the award of industrial licenses were provided to applicants."

The Rajeev Gandhi-led government which came to power in 1985 de-licensed about one-thirds of all three-digit industries. This reform was part of its generally pro-business attitude to governance (Rodrik and Subramanianand (2004)). An even bigger round of delicensing took in 1991, when industrial licensing was abolished for about half of all three-digit industries. This deregulation was part of a program of structural adjustment and liberalization, in response to the macro-economic crisis of the early 1990s.

How were the industries to be delicensed selected? If, for instance, industries expected to grow faster were more likely to be delicensed, then delicensing was endogenous to an industry's growth. But Aghion et al. (2008) find no evidence of a relationship between when an industry is delicensed and its pre-reform output growth. Furthermore, the 1991 wave of delicensing was a response to a macro-economic crisis, and licensing was abolished for nearly *all* products, except for a small number of industries where licensing was retained "for reasons related to security and strategic concerns, social reasons, problems related to safety and overriding environmental issues, manufacture of products of hazardous nature and articles of elitist consumption" (G.O.I (1991)).

2.2 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. India being 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

⁴By definition, all manufacturing units using electrical power that employ more than 10 regular workers, or those that use no power and employ more than 20.

regulation.

Besley and Burgess (2004) read all state level amendments made to the Industrial Disputes Act during 1958-1992 in 16 major Indian states (from Malik (1997)). Each amendment was coded as being either neutral, pro-worker or pro-employer.⁵ The state labor regulation regime in 1992 was then obtained as the sum of these scores over all preceding years. Based on this cumulative score, Besley and Burgess (2004) found that four states- Gujarat, Maharashtra, Orissa and West Bengal- were “pro-worker states”. Six states- Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Rajasthan and Tamil Nadu- were categorized as “pro-employer”, leaving six states- Assam, Bihar, Haryana, Jammu and Kashmir, Punjab and Uttar Pradesh- to be classified as “neutral” with respect to labor laws.⁶

3 Theory

This section presents a simple model of the district economy to illustrate the channels through which entry deregulation in formal industry is expected to affect the informal manufacturing sector. The first is a product market channel, which depends on whether informal sector products are substitutes or complements to those produced in the formal sector. The second, a labor market effect, is caused by shifts in labor demand which results from large-scale entry or exit in formal manufacturing.

In this model, the labor regulation regime in the formal sector is taken as given, and entry deregulation affects informality because it causes an expansion in the formal manufacturing sector of districts, which in turn has general equilibrium effects on other sectors of the district economy. To the extent that the formal manufacturing sector’s expansion in response to entry deregulation depends on labor laws, these effects too will vary across districts with different labor laws.

This model incorporates two mechanisms which embody the notion of inefficiency, or “overcrowding” in the informal sector. First, the informal sector has poor access to managerial skills, input, output and credit markets. Thus, unskilled workers who might be equally

⁵A sample “pro-worker” reform is from West Bengal in 1980: The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments which employ more than 50 workers. Under the central act, these rules only apply to establishments which employ more than 300 workers.

⁶Because very few amendments were carried out in the post-1990 period, this 1992 categorization remains valid throughout the period of my study.

productive in the formal sector might vary in productivity in the informal sector, depending on such factors as social networks (Banerjee (2004), Shah and Biggs (2006)). As people crowd into informality because of low formal wages, the marginal informal enterprise is increasingly less productive. The second notion of overcrowding is related to the fixed costs of accessing broader markets: small informal firms are constrained to serve localized markets, where demand is likely to be inelastic.

Consider a district economy with one industry and two sectors, the formal and the informal, each employing unskilled workers to produce a distinct final product. A key determinant of the district-level impact of deregulation would be the extent of labor mobility across districts and sectors. Labor market shocks originating in organized industry will matter more to the informal sector in the same district when labor is mobile across sectors, but not across districts. There is strong evidence that spatial labor mobility is markedly low in India, with several studies showing that labor markets are local to districts (Munshi and Rosenzweig (2005) and Jayachandran (2006)). Following this, the model assumes that labor does not move across districts. Moreover, given the focus on unskilled workers, I simplify the model by assuming perfect mobility across sectors within districts.

Let w be the district-specific wage in the formal sector, the alternative to which is “self-employment” in the informal sector. Let p_u be the price of the output and c the unit cost of input in the informal sector.⁷ I assume that there is no fixed cost to production in the informal sector, and that any individual i can produce θ_i units of output per unit of input. θ_i varies across individuals, and is drawn from a uniform density function: $\theta \in [\theta_l, \theta_h]$. Let $k = \theta_h - \theta_l$.

Given the alternative of employment in the formal sector at wage w , an individual will stay self-employed if and only if

$$p_u \theta_i - c \geq w \tag{1}$$

or if

$$\theta_i \geq \theta_c = \frac{c + w}{p_u} \tag{2}$$

For a mass N of workers, this implies that the number seeking self-employment in industry i

⁷The subscript u denotes “unorganized”, the official Indian term for the informal sector. Similarly, the subscript o denotes “organized”, or formal.

is $\frac{N}{k}(\theta_h - \theta_c)$. The total supply of goods produced in the informal sector is

$$S(w, c, p_u) = \frac{N}{2k}(\theta_h^2 - \theta_c^2) \quad (3)$$

Let $D^u(p_u, p_o, W)$ denote the demand for goods manufactured in the informal sector, which depends on a vector of exogenous district-level characteristics W , and the price p_o of the formal sector product. First, to highlight how the impact of a product demand shock in the informal sector can differ from a labor market shock when demand for the informal commodity is local, I assume that demand for the informal commodity is perfectly inelastic in its own price:

$$D^u(p_u, p_o) = g(p_o, W)D \quad (4)$$

The equilibrium price p_u^* in the state is determined by the informal product market clearing condition:

$$S(w, c, p_u) = g(p_o, W)D \quad (5)$$

Thus,

$$p_u^* = \frac{(w^* + c_i)}{Z} \quad (6)$$

where w^* is the equilibrium wage, and Z a function of the model's parameters.

$$Z = \left(\frac{N}{N\theta_h^2 - 2kg(p_o, W)D} \right)^{\frac{1}{2}} \quad (7)$$

Note that this condition implies that the informal sector productivity cutoff θ_c is fixed at Z : with perfectly inelastic demand, equilibrium in the goods markets requires a constant level of employment in the informal sector.

Let $A - bw$ be the labor demand in the formal sector. Then, given labor mobility across sectors, the state labor market clearing condition is

$$(A - bw) + \frac{N}{k}(\theta_h - Z) = N \quad (8)$$

This determines the equilibrium wage,

$$w^* = \frac{1}{b} \left(A - N + \frac{N}{k}(\theta_h - Z) \right) \quad (9)$$

The Product Market Effect of Delicensing

Suppose entry into formal manufacturing, causes a decline in p^o , the price of the formal commodity. The effect of this price shock on the informal sector will depend on whether the informal sector produces substitutes or complements to the item produced in the formal sector. Suppose it is the former: that is, $\frac{\partial D^u(\cdot)}{\partial p^o} > 0$. Then, Equation 6 implies that $\frac{\partial p_u^*}{\partial p^o} > 0$: the informal price p_u^* falls when the formal sector's product becomes cheaper. Equation 2 then implies that the productivity cutoff θ_c rises, which means that total output, employment and revenue in the informal sector decline. Given productivity θ_i , value added by informal worker i ($p_u\theta_i$) falls, but since the some of the least productive workers have left the informal sector, the net effect on *average* value added per worker in the informal sector is ambiguous.

These predictions would be reversed if the informal sector produces goods which are complements to those made in the formal sector of the same industry.

The Labor Market Effect of Delicensing

Suppose labor demand in the formal sector expands due to entry deregulation. This can be modeled as an increase in the parameter A . The equilibrium wage expression in Equation 9 implies that this will increase the district wage. Moreover, the informal product market clearing condition (Equation 6) then indicates an increase in the informal commodity's price. In fact, given perfectly inelastic demand, p_u must increase exactly in proportion to the wage, to the point where the effect of this wage increase on the productivity cutoff θ_c is nullified.

Thus, in this polar case of perfectly inelastic demand, a positive labor demand shock in the formal sector does not cause labor exit or output loss in the informal sector, but the consequent price rise *increases* total informal sector revenue. Moreover, since the productivity cutoff θ_c is the same as before, value added per worker ($p_u\theta_i$) has increased. The intuition behind this is that with inelastic demand, any outside pull on informal workers must be countered by an increase in average returns in the informal sector. Conversely, any pressure towards entry (or *overcrowding*) must lower average returns.

Consider the more realistic case of less than perfectly inelastic demand in the informal market. Formal sector labor demand expansion will put an upward pressure on the wage and on p_u . But the informal product price increase will be less than proportional, and consequently, the productivity cutoff θ_c will rise in equilibrium. Thus, there will be exit from the informal sector. Value added per worker will increase, not just because p_u has risen, but also because of a reallocation effect: the average worker remaining in the informal sector now has higher

productivity. Change in total revenue will depend on the elasticity of demand: if it is high enough, total revenue earned in the informal sector will fall.

This analysis leads to the following conjectures on the net consequence of formal sector expansion on the informal sector. If formal and informal goods are substitutes, and the demand for the informal product is less than perfectly inelastic, then both the product and labor market effects of an expansion in the formal sector are to lower informal employment. The net effects on revenue and on average value added per worker are ambiguous, since the product and labor market shocks can have opposite effects. The product demand shock by itself lowers revenue and value added in the informal sector, but if demand for the informal good is highly inelastic, revenue and even value added per worker may rise on net as sectoral employment contracts. Moreover, if productivity in the informal sector is heterogeneous, then the exit of the least productive informal workers also tends to raise average productivity in the informal sector.

To the extent that unskilled workers can move across industries but not districts, the labor market channel operates within districts, but across industries. The product market effect, on the other hand, is likely to operate more strongly within industries. Lastly, if the formal sector good is traded across districts, then the product market effect would be an economy-wide shock and not vary significantly across districts. In that case, it would not be detectable in cross-district comparisons.

A third channel through which expansion in the formal sector could affect informality is the cost of inputs. Suppose formal sector growth raises the district price of inputs, increasing c . Then, the cutoff θ_c rises, lowering informal employment and revenue, and possibly even value added per informal worker.

4 Empirical Strategy and Specification

4.1 Examining Broad Trends in Informality: State and Industry-Level Regressions

In preliminary regressions, I use data disaggregated by state and 3-digit industry group to describe changes in informal sector outcomes before and after 1991, the year in which a majority of industries were delicensed. The regressions measure how this change varied across

states with different labor laws, and whether it differed by the licensing status of the industry. The basic specification is as follows:

$$y_{ist} = \theta_{is} + \alpha Post_t + \beta Post_t * Labor_s + \gamma Post_t * Labor_s * D91_i + e_{ist} \quad (10)$$

y_{ist} is some characteristic of the informal manufacturing sector in industry i , state s and year t , and θ_{is} is a state-industry fixed effect. $Post_t$ is a dummy indicating the post-delicensing years, 1994 and 2000. $D91_i$ is an industry-specific dummy which is equal to one in those industries which were delicensed in 199.⁸ $Post_t * Labor_s$ is an interaction of the post-1991 dummy with $Labor_s$, a measure of the labor law in state s .

The coefficient on $Post_t * Labor_s$ measures how post-reform growth in the informal sector varied across states with different labor laws. Note that this is the average change in *all* industries. The coefficient on $Post_t * Labor_s * D91_i$ measures how this post-reform differential growth by labor law varied across delicensed and non-delicensed industries.

As in Aghion et al. (2008), instead of a monotonic labor law measure $Labor_s$, I use two labor regulation dummies: a dummy indicating if a state has *pro-employer* labor laws, and another indicating a *pro-worker* labor law regime. A state in which both these dummies are equal to zero is a *neutral* labor regulation state. If there was greater post-1991 exit from informality in states where labor laws were more flexible, then the coefficient on $Post * Pro-employer$, which measures change relative to *Neutral* states, should be negative.

These state and industry level regressions are unable to distinguish the effects of delicensing from other shocks that may have varied across states. Hence, I interpret these regressions as being informative of how growth in informality varied across states and industries in the post-delicensing periods, and not as indicating the causal impact of delicensing. To identify the impact of delicensing, I exploit district-level variation in the expected effect of delicensing, using the specification described below.

4.2 Main Specification: District-Level Regressions

The main regressions in this paper measure how growth in the informal sector in a district relates to the district's pre-reform size of the delicensed industrial sector, comparing this relationship across states with different labor laws, while controlling for all state-specific shocks

⁸About half of all 3-digit industries.

through state-year fixed effects.

$$\begin{aligned} Informal_{dst} = & \delta_d + \gamma_{st} + \alpha Delicensed_d * Post_t + \beta_1 Delicensed_d * Proemployer_s * Post_t \\ & + \beta_2 Delicensed_d * Proworker_s * Post_t + \epsilon_{d,s,t} \end{aligned} \quad (11)$$

$Informal_{dst}$ is a measure of an informal sector outcome in district d , state s and year t . δ_d and $\gamma_{s,t}$ are the set of district and state-year dummies, respectively. $Post_t$ is a dummy for post-1991 years. *Pro-employer* and *Pro-worker* are state labor law dummies, with the default being a “neutral” labor law state.

$Delicensed_d$, which proxies for the strength of the deregulation shock in each district, is the pre-1991 size of the delicensed factory sector in district d . Specifically, it is the total fixed capital in factories located in district d and belonging to industries delicensed in 1988. Districts with larger values of $Delicensed_d$ are expected to have experienced a larger entry deregulation shock in 1991. Thus, if the effect of entry deregulation on reducing informality depends on the flexibility of labor laws in the formal sector, then the relationship between the decline in informality and $Delicensed_d$ should be strongest in *in pro-employer states*. So, when the outcome variable is employment or the number of establishments in the informal sector, I expect β_1 (and not β_2) to be negative.

The identification assumption behind this empirical strategy is that unobserved determinants of post-reform growth in informality did not vary systematically across districts with different pre-reform sizes of the delicensed factory sector in a manner systematically different across states with different labor laws. Note that this is robust to unobservables correlated with $Delicensed_d$, provided that the effect of these unobservable variables on informality does not depend on labor laws.

$Delicensed_d$ is correlated with the total size of the formal manufacturing sector in a district. To emphasize that the $Delicensed_d$ interactions with $Post$ and the labor law dummies reflect the effect of delicensing, and not the consequences of having a larger industrial sector per se, I include interactions of $Post$ and the labor law dummies with the district size of the *non-delicensed* factory sector as controls, and test that these interactions are not significantly related to changes in the informal sector.

India undertook several industrial and trade policy reforms in the 1990s. Prominently, import tariffs were lowered significantly in most industries, and this trade liberalization across industries varied in timing and extent. This gives rise to the concern that districts with

different pre-1991 industrial size and composition experienced systematically different impacts of this trade policy reform. These effects too might have varied by industrial labor regulation. There is no evidence, though, that tariff reductions varied systematically across delicensed and non-delicensed industries. Moreover, since tariffs declined throughout the 1990s, unlike entry deregulation the effects of tariff liberalization would have lasted throughout the 1990s. So, as a check against the possibility that the $Delicensed_d * Post_t$ interactions pick up *trends* in informality that varied across districts in a way systematically related to $Delicensed_d$ and labor laws, I use all three years of data to test that the differential change by $Delicensed_d * Proemployer$ was strongest immediately after 1991 and weakened afterwards.

$$\begin{aligned}
Informal_{dst} = & \delta_d + \gamma_{st} + \alpha Delicense_d * Post_t + \beta_1 Delicense_d * Proemployer_s * Post_t \\
& + \beta_2 Delicense_d * Proworker_s * Post_t + \nu Delicense_d * Y2_t \\
& + \rho_1 Delicense_d * Proemployer_s * Y2_t + \rho_2 Delicense_d * Proworker_s * Y2_t + \epsilon_{d,s,t} \quad (12)
\end{aligned}$$

Here, $Post_t$ equals one in 1994 and 2000, while $Y2_t$ indicates the year 2000. If a differential trend is driving the results, then ρ_1 should be statistically significant and have the same sign as β_1 . The delicensing “shock” itself cannot cause this because over time, delicensing would have led to more entry than expansion of incumbent factories, making the pre-1991 industrial composition of a district an increasingly weak predictor of the district-level industrial response to the reform.

5 The Data

5.1 The Informal Manufacturing Sector

My primary data sources on the informal sector are surveys of India’s “unorganized”, or informal manufacturing establishments. Indian manufacturing enterprises with fewer than ten hired worker are termed unorganized, and are not subject to the same industrial licensing or labor laws as registered factories. These informal manufacturing establishments are of two types- household enterprises, which use family labor and are often single-person establishments, and small business establishments with up to ten hired workers.

The National Sample Survey Organization (NSSO) of India conducted surveys of manufacturers in the unorganized sector in 1989, 1994 and 2000. These were nationwide enterprise-level surveys stratified by district. Since most informal enterprises are not registered with any government authority, the NSSO used a block enumeration approach to ensure a representative

sample of the informal sector in every district.

I aggregated the establishment-level data from these surveys to estimate total employment and value added in informal manufacturing by district. To maintain representativeness at the district level, I weighted the establishment-level numbers by the inverse of the sampling probabilities (the survey “multipliers”) before aggregating the data. The resulting data-set has three years of data on 295 districts from 16 major states.

Since these states account for nearly 95% of the Indian population, this is a nationally-representative data set on the informal sector, but with two caveats. First, the 1989 NSS was by design targeted at household enterprises and small business enterprises employing at most six hired workers, ignoring small enterprises hiring 6-10 workers. Second, because of unreliable district identifiers for urban enterprises surveyed in 1989, these district data only pertain to establishments located in rural areas.⁹ Hence, the data set is 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 (NSSO (2001)).

I also aggregated the establishment-level data to state and 3-digit industry-level, using the 1987 National Industrial Classification codes of India. This alternative data set contains estimates of informal manufacturing sector outcomes in 130 3-digit industries, for each of the 16 major states, and is used in the state and industry level estimations reported in Table 3.

5.2 The Formal Manufacturing 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 my district-level data on factories is the Annual Survey of Industries (ASI), a comprehensive survey/census of factories nationwide 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

⁹Following the Census of India’s classification scheme, the NSSO divides each district into “blocks”, where a block is either rural and urban.

used to estimate industrial sector aggregates at regional levels by weighting the factory-level data by the inverse of the sampling probabilities.

Since the informal sector data set is representative of enterprises located in rural areas, to ensure comparability, I included only factories located in rural areas in aggregating ASI data to the district level. The factory data set has district-level estimates of total employment and value added in rural factories for 271 districts and three years, namely 1990, 1997 and 2000.¹⁰

5.3 The Delicensing “Shock” Variable

I used data on fixed capital in factories surveyed by the ASI in 1988 to estimate the pre-reform size of delicensed industries in the rural areas of every district. The variable *Delicensed* is an estimate of the district’s total fixed capital, as of 1988, in rural factories belonging to industries delicensed in 1991. *Non-Delicensed* is total fixed capital in all other industries.

5.4 Delicensing and Labor Laws

Data on the date of delicensing of three-digit industries are from Aghion et al. (2008). The authors first assigned three-digit codes to all the industries licensed under the 1951 Industries Act (and subsequent amendments to that act). Then, they used statements on industrial policy, press notes and notifications issued by the Government of India to construct a delicensing dummy variable which is equal to one if all or part of a three-digit manufacturing industry is delicensed in a particular year, and stays equal to one in subsequent years.

The measure of flexibility in a state’s labor law in 1990 is based on the cumulative Besley-Burgess coding of state-level amendments to the Industrial Disputes Act (Besley and Burgess (2004)), which was described in Section 2.2. This information is coded in two time-invariant state-level dummies, *Pro-employer* and *Pro-worker*. A state which is neither pro-employer nor pro-worker in its labor regulation is a *neutral* state. Pro-employer states have the most flexible labor laws.

Table 1 summarizes the district-level data used in the main estimations. Since some preliminary regressions will describe trends in informality by state and industry group, Table

¹⁰The total number of districts in the ASI data is less than 295 because changing district identifiers in later ASI rounds made it difficult to match all the districts across the three rounds. I have verified that my results on the informal sector are robust to keeping only these 271 districts.

2 summarizes the informal sector data by state and industry.

6 Trends and Estimation Results: State-Industry Data

Figure 1 shows that as measured by the total number of establishments or employment, India's informal manufacturing sector contracted during the period spanning two years before and after the 1991 delicensing. There was also a decline in value added per worker, but it was relatively minor. In contrast to this post-reform decline, the informal sector expanded between 1994 and 2000.

Next, Figure 2 compares trends in informality across states with flexible (pro-employer) and inflexible (pro-worker and neutral) labor regulation. Panels A and B show that unlike the inflexible labor laws states, the number of establishments and employment in the informal manufacturing sector fell in pro-employer states between 1988 and 1994. Panel C shows that unlike employment, between 1988 and 1994, value added per informal worker *increased* in pro-employer states, and fell in other states.¹¹ The graphs also show that this divergence in trends across states was no longer in evidence after 1994. Thus, these broad trends are consistent with the expected labor market effects of entry deregulation: greater immediate declines in employment and increased productivity in the informal sector in states with flexible labor laws, as compared to other states.

Table 8 confirms these patterns in regressions on state-industry data. This specification was described in Section 4, and is estimated here using data from 1989, 1994 and 2000:

$$y_{ist} = \theta_{is} + \alpha Post_t + \beta Post_t * Labor_s + \gamma Post_t * Labor_s * D91_i + e_{ist} \quad (13)$$

Column 1 shows that the number of informal enterprises in the average state-industry cell declined significantly after 1991, and that this decline did not vary across delicensed and other industries. Next, the OLS estimate of the full specification- which includes interactions with the state labor law categories- is presented in Column 2. Here, the the coefficient on *Post*Pro-employer* is negative and significant at the 10% level. This indicates that post-1991 decrease in informal enterprises was significantly higher (by about 23 percentage points) in states with pro-employer labor laws, as compared to states with neutral or pro-worker labor

¹¹Pro-worker and neutral states have been aggregated for ease of exposition, since trends in these states were similar.

laws. The coefficients on the interactions of $Post$, $Post*Pro\text{-}employer$ and $Post*Pro\text{-}worker$ with $D91$ are not significant, indicating that these trends in informality were common to informal enterprises in all industries, and did not depend on whether they were in delicensed product categories or not.

The regression presented in Column 3 adds interactions of $Pro\text{-}employer$ and $Pro\text{-}worker$ with a dummy for year 2000 to the set of explanatory variables. None of these interaction coefficients (including $Post*Pro\text{-}employer*Year2000$) are significant, which indicates that the cross-state divergence in informality which emerged after 1991 did not increase over time. This result supports the view that $Post$ and $Post*Pro\text{-}employer$ reflect the impact of delicensing, and not some differential trend in informality.

Columns 4 and 5 look at employment and average value added per workers in informal enterprises, respectively. Results for employment are similar to those for the number of enterprises, although noisier. In contrast, value added per worker increased significantly in pro-employer states: the coefficient on $Post*Pro\text{-}employer$ is positive and significant at the 1% level. This suggests that the decline in informality was due to a negative labor supply shock, and not a product market shock.

These interpretations of the state-level regressions are subject to concern there could have been shocks to manufacturing in the early 1990s which were systematically different across these groups of states. The next set of regressions therefore look at within-state variation in the delicensing shock to identify the impact of deregulation and labor law on the informal sector. Since aggregate patterns in informality did not vary across industries, these estimations pool enterprises belonging to different industries.

7 District-Level Estimation Results

7.1 The Informal Sector

Table 4 estimates the following equation using district-level data on the informal manufacturing sector in 1989 and 1994:

$$\begin{aligned} Informal_{dst} = & \delta_d + \gamma_{st} + \alpha Delicensed_d * Post_t + \beta_1 Delicensed_d * Proemployer_s * Post_t \\ & + \beta_2 Delicensed_d * Proworker_s * Post_t + \epsilon_{d,s,t} \end{aligned} \quad (14)$$

$Delicensed_d$, the pre-reform capital stock in all delicensed factories located in district d , proxies for the size of the delicensing shock at the district level.¹² Note that $Delicensed_d*Post_t$ and its interactions measure *relative* effects across districts. Moreover, since the γ_{st} dummies control for all state-year specific shocks, absorbing any effects of delicensing that were common to all districts within every state, the absolute impact of deregulation is not identified in this specification.

Columns 1 and 2 show results from estimating Equation 14 with the logarithm of the number of informal enterprises as the outcome variable; they differ in that the regression in Column 1 does not include state-year FEs. The regression presented in Column 3 includes interactions of $Post$ and the labor law dummies with the pre-reform size of the *non-delicensed* factory sector as controls. This is to verify that the interactions terms involving $Delicensed$ do not merely reflect some underlying trend in informality that varied across districts at different levels of industrialization. Finally, Columns 4 and 5 look at total employment in informal manufacturing.

The key result in Table 4 is that as hypothesized, the coefficient on $Delicensed*Pro-employer*Post$ is negative and statistically significant in all specifications, and for both outcome variables. In Column 2, for instance, the estimated coefficient on $Delicensed*Pro-employer*Post$ implies that a doubling of the pre-reform delicensed factory capital of a district is associated with a 7 percentage points higher post-reform (1989-94) rate of decline in the number of informal establishments in pro-employer states, relative to other states. The coefficient on $Delicensed*Pro-worker*Post$ is not significant, implying that delicensing did not affect the informal sector differentially in pro-worker states as compared to neutral states. Finally, as expected, the $Non-Delicensed*Pro-employer*Post$ terms are not significant, and their inclusion does not have a large effect on the point estimate of the coefficient on $Delicensed*Pro-employer*Post$.

Informal employment and the number of informal enterprises are highly correlated since the majority of informal employment is in single-person household enterprises. But the magnitude of the estimated negative coefficient on $Delicensed*Pro-employer*Post$ is larger when the employment is the outcome. This difference in proportional growth impacts suggests that the impact of deregulation was felt not only through closures of single-person household enterprises, but also through workers leaving small business establishments.

¹²Section 7.2 will validate this strategy through similar regressions on formal sector outcomes.

Table 5 re-estimates these regressions after adding data from the year 2000. As specified in Equation 15, these regression include interactions of *Delicensed* , *Delicensed*Pro-employer*, and *Delicensed*Pro-worker* with *Year2001* to test against a differential trend driving the result in Table 4. This addition does not affect the estimated coefficients on *Delicensed*Pro-employer*Post* and *Delicensed*Pro-worker*Post*, and the *Year2000* interaction terms are never significant, which is evidence against a differential trend. These results are also consistent with the idea that over time, as delicensing led to more entry than expansion of incumbent factories, the pre-1991 industrial composition of a district became an increasingly weak predictor of the district-level delicensing shock.

Overall, these differences in differences results are consistent with the state level results, and strongly indicate that entry deregulation reduced informality to a significantly greater extent in states with flexible labor regulation.

Table 6 considers the impact of deregulation on revenue and value added in the informal sector. Columns 1-2 reveal that delicensing had a significantly more negative effect on total revenue and value added in pro-employer states as compared to neutral and pro-worker states. This estimated differential effect is similar in magnitude to that corresponding to employment, which implies that the relative decline in employment in pro-employer states was accompanied by a relative decline of equal proportions in revenue and value added. Next, Columns 3 and 4 indicate that unlike total employment, revenue or value added, delicensing did not lead to a significantly different decline in revenue or value added *per worker* in pro-employer states relative to other states. The signs on the *Delicensed*Pro-employer*Post* and *Delicensed*Pro-worker*Post* are reversed, but neither is statistically significant. This result is weakly consistent with the state-level regressions, where value added per worker showed a statistically significant relative *increase* in pro-employer states.

The theoretical model suggests two reasons why formal entry deregulation can increase value added per worker in the informal sector, and two reasons why it can decrease it. As workers leave the informal sector, average value added per remaining worker increases if the least productive informal workers are the first to exit into the factory sector, and if informal commodity prices increase as total informal sector output decreases. Value added per worker decreases if the expansion of the formal sector decreases demand for the informal commodity or raises the cost of inputs. The result in Table 6 suggests that these opposing factors were in balance.

It is possible that labor regulations are correlated with other state characteristics which determine the response of enterprises to entry reform. For instance, Indian states vary significantly in their income levels, and it could be that the response of industry to deregulation was stronger in more developed states. To verify that the main results are robust to allowing for the impact of delicensing to vary by the overall level of development of states, Table 7 presents results from regressions in which interactions of state GDP with *Delicensed * Post* have been added to the set of explanatory variables. The estimated coefficients on *Delicensed * Pro-employer * Post* remain unchanged. The interaction of state GDP with *Delicensed * Post* is negative and significant at the 10% level when the outcome is informal sector employment, suggesting that the exit from informality was greater in more developed states.

7.2 The Formal Sector

Table 8 presents results from regressing formal sector (factory) outcomes on *Post* and its interactions with the delicensing shock and the labor law dummies. These estimations primarily serve to validate the identification strategy by showing that the formal manufacturing sector expanded more in districts that had more sizable pre-reform investment in delicensed industries, in states with flexible labor laws as compared to others. Moreover, in measuring the district-level relationship between labor laws and the impact of entry deregulation on the formal manufacturing sector, they also contribute to the literature on entry deregulation and the formal sector through their use of a novel differences in differences approach. Together, the results in this section and Section 7.1 give a full picture of the joint effects of entry deregulation and labor laws on the entire manufacturing sector (formal and informal).

These estimations use data on factories for 1990, 1997 and 2000. The regression specification is based on that described in Section 4.2:

$$\begin{aligned}
 Formal_{dst} = & \delta_d + \gamma_{st} + \alpha Delicense_d * Post_t + \beta_1 Delicense_d * Proemployer_s * Post_t \\
 & + \beta_2 Delicense_d * Proworker_s * Post_t + \nu Delicense_d * Y2_t \\
 & + \rho_1 Delicense_d * Proemployer_s * Y2_t + \rho_1 Delicense_d * Proworker_s * Y2_t + \epsilon_{d,s,t} \quad (15)
 \end{aligned}$$

Post equals one in 1997 and 2000. *Yr2000*, a dummy for year 2000 and its interactions is included to test if the patterns reflect a differential trend, as opposed to an immediate local area impact of deregulation.

The results are consistent with the assumption behind the identification strategy: the

estimated coefficient on *Delicensed*Pro-employer*Post* is positive and statistically significant (except when revenue is the outcome). For instance, Column 1 shows that compared to other states, in a pro-employer state, a doubling of the pre-reform delicensed capital stock of a district is associated with 8 percentage points higher growth in overall formal factory employment after the wave of delicensing. The corresponding differential for growth in value added in the formal sector (Column 3) is about 36 percentage points. Thus, relative to other states, districts with a larger pre-reform delicensed sector did experience greater formal sector growth in pro-employer states. The *Yr2000* interaction effect estimates imply that these differences in growth had begun to diminish by 2000, which further confirms the identification strategy by showing that the *Delicensed*Pro-employer*Post* coefficient does not reflect some difference in industrial trends across districts or states.

Column 4 shows that after delicensing, districts with larger pre-reform delicensed capital stocks experienced larger increases in value added per worker in registered factories in pro-employer states as compared to other states. This supports the hypotheses that deregulation reduced informality through labor market effects, since it suggests that in relative terms, wages in the formal industrial sector of pro-employer states increased. Recall that value added per worker in informal manufacturing was not affected by the exits from the informal sector (Table 6, Column 4). Together, these results- a reallocation of workers to the formal sector accompanied by an increase in value added per formal worker-suggest an overall increase in earnings in the manufacturing sector of pro-employer states.

8 Conclusion

Most developing countries have vast numbers working in small, informal establishments, or in self-employment. Given the extremely low productivity levels observed in the informal sector, there is a great deal of interest in understanding informality, and in formulating policies which encourage a reallocation from informal to formal enterprises. It is, in particular, important to understand if informality is largely a response to inflexible regulations.

This paper used nationally representative district-level data on India's informal manufacturing enterprises (household enterprises and small businesses) as well as regulated factories to examine this question in the context of major entry regulation reform. The findings in this paper suggest that removing regulatory barriers to industrial entry was successful in reduc-

ing informality, mainly because rising labor demand in the formal sector induced workers to leave low-paying informal jobs and move to formal enterprises. This labor reallocation was markedly higher in states where labor laws give more flexibility to employers in the formal manufacturing sector.

The findings also suggest that there might be substantial productivity benefits associated with the exit from informality which is induced by regulatory reform. While value added per worker in the informal manufacturing sector was unaffected by entry deregulation, that in the formal manufacturing sector increased. Since this was accompanied by an employment shift towards the formal sector, value added per worker in manufacturing increased on average. This productivity increase also depended on the degree of flexibility of labor laws.

This complementarity between entry liberalization and the flexibility of labor regulation raises an important policy question. One of the benefits of formalizing firms is that it offers workers some degree of formal protection. To that extent, more pro- worker labor laws are beneficial to those who are able to find formal jobs. But the results in this study imply that making labor laws “too” pro- worker may inadvertently hurt overall social protection by encouraging informality. There is no worker protection in the informal sector. This tradeoff- which implies that formal employee protection is not the same as social protection- must be considered when weighing the costs and benefits of labor regulation.

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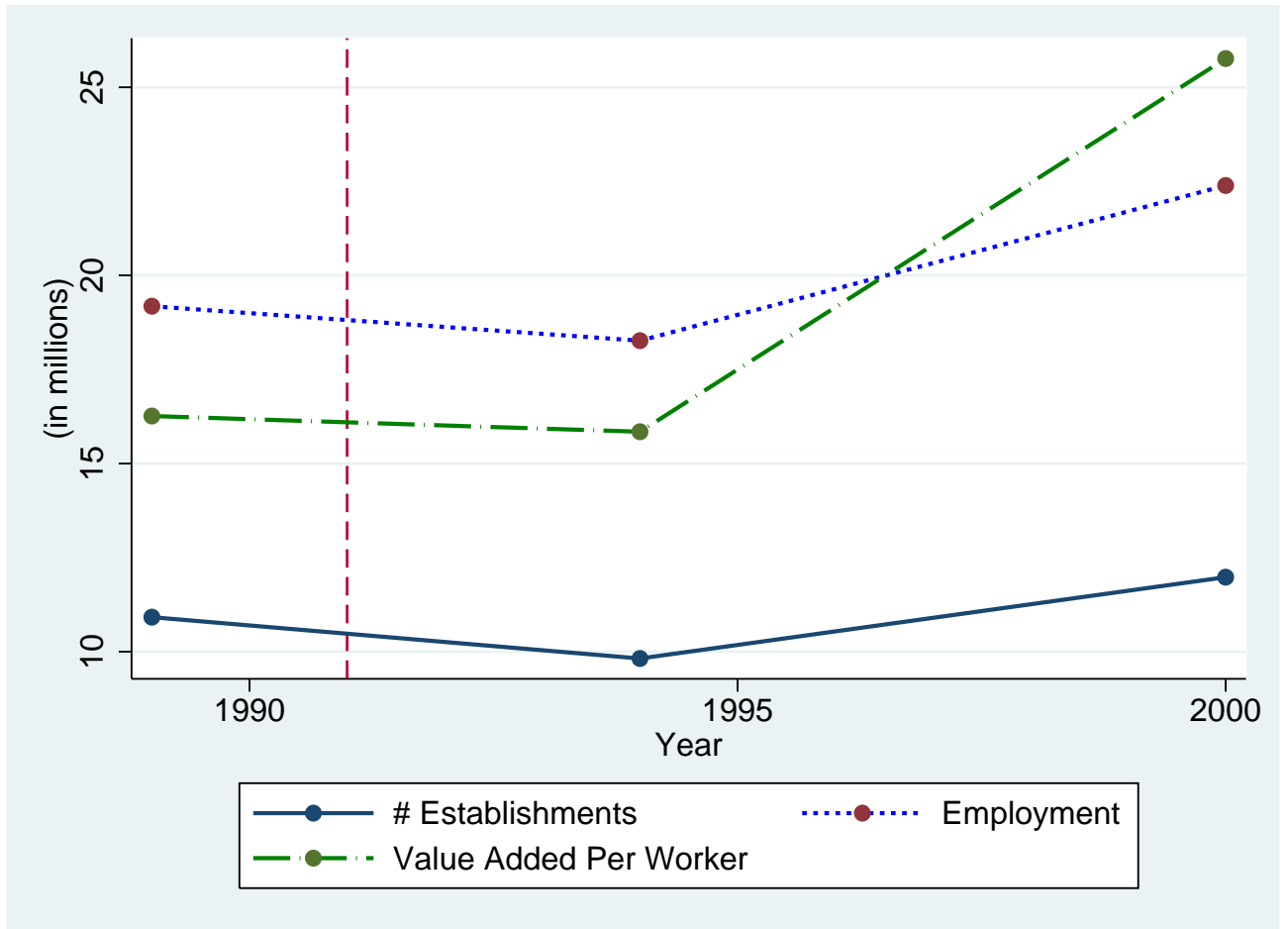


Figure 1: Trends in India's Informal Manufacturing Sector

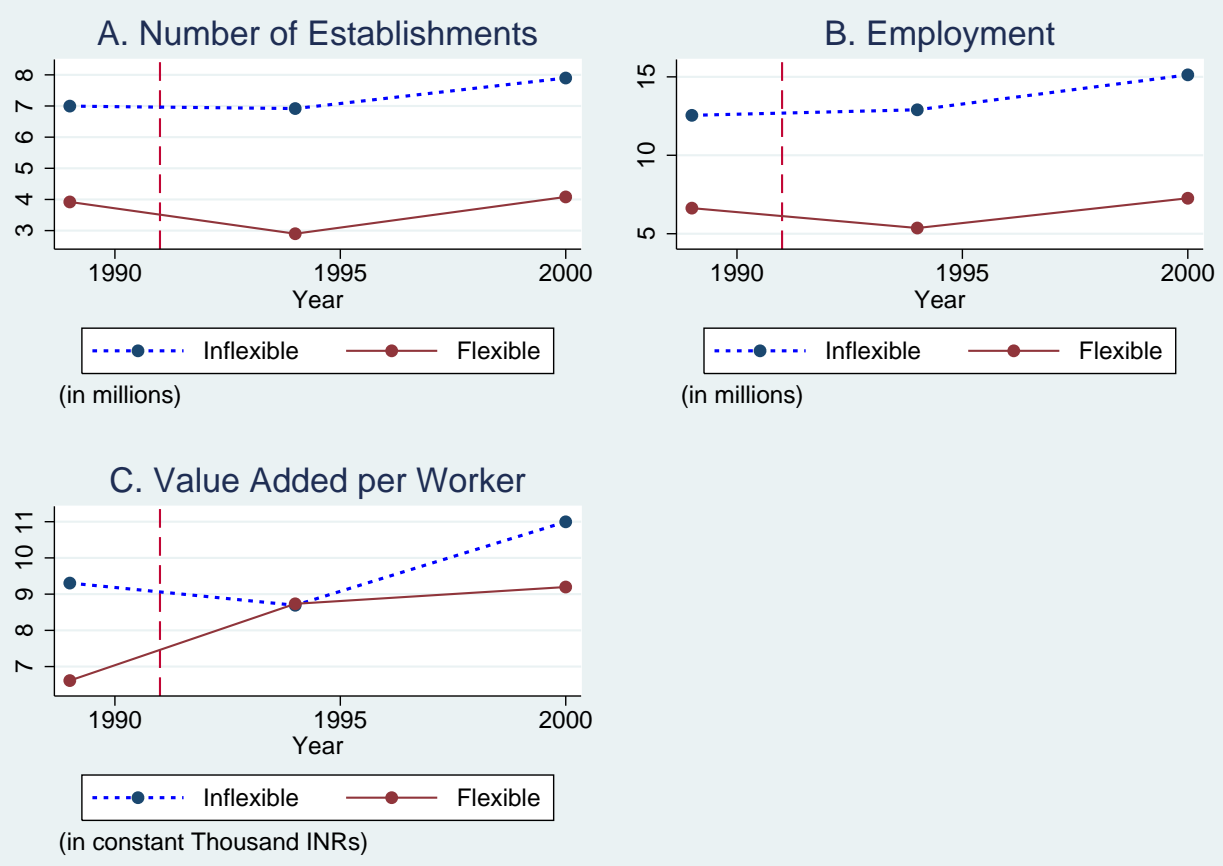


Figure 2: Trends in India's Informal Manufacturing Sector: Comparing States with Different Labor Laws

Table 1: Summary of District-Level Data

Informal Manufacturing Sector			
Year	1989	1994	2000
Number of Enterprises (in thousands)	24.3 (29.4)	22.4 (26.7)	23.8 (24.4)
Employment (in thousands)	40.3 (51)	39.2 (47.5)	42.9 (49)
Revenue (in million INR)	313.4 (562.7)	280 (386.8)	347.9 (450.8)
Value Added (in million INR)	147.8 (195.9)	131.6 (138.5)	162.7 (160.5)
Value Added Per Worker (in thousand INR)	4.5 (3.1)	4.1 (2.1)	4.6 (2.5)
Initial Delicensed Factory Stock (in million INR)		68.7 (39.8)	
N	295	295	295
Formal Manufacturing Sector (Factories)			
Year	1990	1997	2000
Number of Enterprises (in thousands)	0.1 (0.1)	0.1 (0.2)	0.1 (0.2)
Employment (in thousands)	5.4 (7.6)	7.3 (10.6)	7.8 (11.4)
Revenue (in million INR)	2049.5 (4193)	3986.9 (8122.9)	4958.7 (9957)
Value Added (in million INR)	337.1 (659.1)	859.2 (2460.9)	1043.8 (2559.2)
Value Added Per Worker (in thousand INR)	76.7 (209.3)	128.4 (239)	126.5 (178.2)
N	271	271	271

Means across districts, with standard deviations in parenthesis. Revenue and value added are expressed in base (1989) prices.

Table 2: Summary of State-Industry Data on Informal Manufacturing

	1989	Year 1994	2000
Number of establishments (in 1000s)	7.5 (22.2)	6.7 (20.3)	6.6 (17.8)
Employment (in 1000s)	13.1 (38.1)	12.4 (36.5)	12.3 (32.8)
Revenue (in millions INR)	145.3 (507.7)	129.0 (424.1)	160.2 (469.1)
Gross value added (in million INR)	64.9 (205.8)	58.3 (154.3)	68.4 (143.9)
Gross value added per worker (in 1000 INR)	7.9 (11.3)	8.6 (17.6)	10.2 (10.4)
Cumulative number of industries delicensed	43	96	102
Observations	1432	1432	1432

These are averages across state and 3-digit industry cells, with standard deviations in parentheses. All values are in Indian rupees, and revenue and gross value added are expressed in 1989 prices.

Table 3: Informality Before and After 1991- State and Industry-Level Regressions

	Number of Enterprises		Employment		Value Added Per Worker
	(1)	(2)	(3)	(4)	(5)
			in logs		
Post	-.185 (.058)***	-.092 (.094)	-.013 (.104)	-.049 (.113)	-.049 (.090)
Post*D91	-.002 (.085)	.036 (.139)	-.051 (.154)	.035 (.163)	-.066 (.117)
Post*Pro-employer		-.239 (.132)*	-.316 (.152)**	-.227 (.164)	.408 (.125)***
Post*Pro-worker		-.049 (.149)	-.112 (.162)	-.105 (.171)	-.013 (.124)
Post*Pro-employer*D91		-.076 (.193)	-.144 (.224)	-.138 (.239)	-.008 (.173)
Post*Pro-worker*D91		-.049 (.220)	.031 (.243)	-.027 (.265)	.070 (.182)
Yr2000			.410 (.121)***	.591 (.124)***	.391 (.084)***
Yr2000*D91			.247 (.176)	.192 (.180)	-.116 (.113)
Yr2000*Pro-employer			.240 (.180)	.179 (.184)	-.168 (.118)
Yr2000*Pro-worker			-.033 (.186)	-.113 (.189)	-.074 (.116)
Yr2000*Pro-employer*D91			.130 (.263)	.111 (.269)	.041 (.159)
Yr2000*Pro-worker*D91			.205 (.276)	.260 (.288)	.080 (.168)
Obs.	3735	3735	6203	6203	6203
State-Industry FEs	Y	Y	Y	Y	Y

Robust standard errors in parenthesis; ***indicates significance at 1%. An observation is a state*industry*year cell, with 16 states and a maximum of three years- 1989, 1994 and 2000. *D91* is an industry-level dummy variable which is one for three-digit industries delicensed in 1991. *Post* is a dummy equal to 1 for 1994 and 2000, and 0 for 1989. *Proworker* (resp., *Proemployer*) indicates a state with positive (resp., negative) value of Besley-Burgess labor laws index in 1988. The default labor regulation category is “neutral”.

Table 4: Post-reform Growth in Informal Employment versus the Pre-reform Size of Delicensed Industries and Labor Laws (District-Level Regressions)

	Number of Enterprises			Employment	
	(1)	(2)	(3)	(4)	(5)
			in logs		
Post	.310 (.169)*				
Delicensed*Post	.021 (.016)	.037 (.025)	.037 (.025)	.045 (.026)*	.045 (.026)*
Proemployer*Post	.244 (.376)				
Proworker*Post	-.865 (.347)**				
Delicensed*Proemployer*Post	-.060 (.026)**	-.070 (.033)**	-.060 (.032)*	-.096 (.036)***	-.088 (.037)**
Delicensed*Proworker*Post	.008 (.026)	-.018 (.032)	-.005 (.032)	-.034 (.035)	-.022 (.037)
NonDelicensed*Post			-.064 (.048)		-.057 (.049)
NonDelicensed*Proemployer*Post			.013 (.060)		.013 (.060)
NonDelicensed*Proworker*Post			-.0009 (.056)		-.004 (.058)
Obs.	590	590	590	590	590
District FE	Y	Y	Y	Y	Y
State*Year Dummies	N	Y	Y	Y	Y

Robust SEs; *** is 1% significance. These are district level regressions. *Post* is equal to one in 1994. *Delicensed* is 1988 total fixed capital in district ASI factories in delicensed industries. *NonDelicensed* is 1988 total fixed capital in district ASI factories in industries not delicensed in 1991. *Proworker* (resp., *Proemployer*) indicates a state with positive (resp., negative) value of Besley-Burgess labor laws index in 1988.

Table 5: Evidence Against a Differential Trend in the Informal Sector
(District Level Regressions for 1989, 1994 and 2000)

	Number of Enterprises		Employment	
	(1)	(2)	(3)	(4)
			in logs	
Delicensed*Post	.037 (.023)	.037 (.023)	.045 (.025)*	.045 (.025)*
Delicensed*Proemployer*Post	-.070 (.032)**	-.060 (.032)*	-.096 (.035)***	-.088 (.036)**
Delicensed*Proworker*Post	-.018 (.030)	-.005 (.031)	-.034 (.033)	-.022 (.034)
Delicensed*Yr2000	.004 (.017)	.004 (.017)	-.0002 (.018)	-.0002 (.018)
Delicensed*Proemployer*Yr2000	-.005 (.028)	-.010 (.028)	.009 (.030)	.003 (.030)
Delicensed*Proworker*Yr2000	-.011 (.025)	-.009 (.025)	-.005 (.026)	-.004 (.027)
Obs.	885	885	885	885
Interactions with NonDelicensed	N	Y	N	Y
District FE	Y	Y	Y	Y
State*Year Dummies	Y	Y	Y	Y

Robust SEs; *** is 1% significance. These are district level regressions. *Post* is equal to one in 1994 and 2000. *Yr2000* is one in 2000. *Delicensed* is 1988 total fixed capital in district ASI factories in delicensed industries. *NonDelicensed* is 1988 total fixed capital in district ASI factories in industries not delicensed in 1991. *Proworker* (resp., *Proemployer*) indicates a state with positive (resp., negative) value of Besley-Burgess labor laws index in 1988.

Table 6: Post-reform Growth in Informal Earnings versus the Pre-reform Size of Delicensed Industries and Labor Laws (District-Level Regressions)

	Total Revenue	Total Value Added	Revenue Per Worker in logs	Value Added Per Worker
	(1)	(2)	(3)	(4)
Delicensed*Post	.062 (.023)***	.057 (.024)**	.017 (.010)	.012 (.009)
Delicensed*Proemployer*Post	-.085 (.039)**	-.085 (.039)**	.002 (.018)	.003 (.018)
Delicensed*Proworker*Post	-.041 (.034)	-.042 (.035)	-.019 (.016)	-.020 (.014)
Delicensed*Yr2000	-.003 (.018)	-.002 (.018)	-.003 (.010)	-.002 (.008)
Delicensed*Proemployer*Yr2000	.025 (.031)	.013 (.032)	.022 (.017)	.010 (.015)
Delicensed*Proworker*Yr2000	-.009 (.029)	.002 (.027)	-.005 (.017)	.006 (.014)
Obs.	885	885	885	885
Interactions with NonDelicensed	Y	Y	Y	Y
District FE	Y	Y	Y	Y
State-Year Dummies	Y	Y	Y	Y

Robust SEs; *** is 1% significance. These are district level regressions. *Post* is equal to one in 1994 and 2000. *Yr2000* is one in 2000. *Delicensed* is 1988 total fixed capital in district ASI factories in delicensed industries. *NonDelicensed* is 1988 total fixed capital in district ASI factories in industries not delicensed in 1991. *Proworker* (resp., *Proemployer*) indicates a state with positive (resp., negative) value of Besley-Burgess labor laws index in 1988.

Table 7: Robustness Check: Controlling For Differential Effect of State GDP (District-Level Regressions)

	Number of Establishments	Employment in logs	Value Added	Value Added Per Worker
	(1)	(2)	(3)	(4)
Delicensed*Post	.746 (.438)*	.860 (.484)*	.774 (.465)*	-.086 (.170)
Delicensed*Proemployer*Post	-.082 (.034)**	-.112 (.037)***	-.107 (.041)***	.006 (.018)
Delicensed*Proworker*Post	.007 (.032)	-.008 (.036)	-.030 (.035)	-.021 (.014)
Delicensed*NSDP*Post	-.049 (.030)	-.056 (.033)*	-.049 (.032)	.007 (.012)
Obs.	885	885	885	885
Interactions with NonDelicensed	Y	Y	Y	Y
Interactions with Year2000 Dummy	Y	Y	Y	Y
District FE	Y	Y	Y	Y
State-Year Dummies	Y	Y	Y	Y

Robust SEs; *** is 1% significance. These are district level regressions. *Post* is equal to one in 1994 and 2000. *Yr2000* is one in 2000. *NSDP* is state domestic product in 1988. *Delicensed* is 1988 total fixed capital in district ASI factories in delicensed industries. *NonDelicensed* is 1988 total fixed capital in district ASI factories in industries not delicensed in 1991. *Proworker* (resp., *Proemployer*) indicates a state with positive (resp., negative) value of Besley-Burgess labor laws index in 1988.

Table 8: Post-reform Growth of the Formal Sector vs. the Pre-reform Size of Delicensed Industries and Labor Laws (District Level Regressions)

	Employment	Revenue	Factory Value Added in logs	Value Added Per Worker
	(1)	(2)	(3)	(4)
Delicensed*Post	-.042 (.042)	-.052 (.036)	-.076 (.039)*	-.030 (.025)
Delicensed*Proemployer*Post	.082 (.049)*	.189 (.118)	.366 (.134)***	.217 (.092)**
Delicensed*Proworker*Post	.037 (.046)	.066 (.052)	.094 (.056)*	.053 (.043)
Delicensed*Yr2000	.017 (.038)	.0007 (.034)	.023 (.035)	.029 (.026)
Delicensed*Proemployer*Yr2000	-.075 (.044)*	-.131 (.077)*	-.227 (.090)**	-.138 (.064)**
Delicensed*Proworker*Yr2000	-.029 (.041)	-.040 (.046)	-.077 (.051)	-.070 (.041)*
Obs.	813	813	813	813
Interactions with NonDelicensed	Y	Y	Y	Y
District FE	Y	Y	Y	Y
State-Year Dummies	Y	Y	Y	Y

Robust SEs; *** is 1% significance. *Post* is equal to one in 1997 and 2000. *Yr2000* is one in 2000. *Delicensed* is 1988 total fixed capital in district ASI factories in delicensed industries. *NonDelicensed* is 1988 total fixed capital in district ASI factories in industries not delicensed in 1991. *Proworker* (resp., *Proemployer*) indicates a state with positive (resp., negative) value of Besley-Burgess labor laws index in 1988. The outcome variables are, respectively, district-level total employment, revenue, value added and value added per worker in registered (ASI) factories.