



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

WP 2014-05
January 2014



Working Paper

Charles H. Dyson School of Applied Economics and Management
Cornell University, Ithaca, New York 14853-7801 USA

REGULATION AND NON-COMPLIANCE: Magnitudes and Patterns for India's Factories Act

Urmilla Chatterjee and Ravi Kanbur

It is the Policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.

Regulation and Non-Compliance: Magnitudes and Patterns for India's Factories Act

Urmila Chatterjee
The World Bank

and

Ravi Kanbur
Cornell University

Version: December 9, 2013*

Abstract¹

Non-compliance with regulations by enterprises is said to be rife in developing countries. Yet there is limited systematic evidence of the magnitude of non-compliance at the enterprise level. Making innovative use of two complementary data sources, we are able to quantify non-compliance for India's Factories Act without the question of illegality ever being raised directly with enterprises. We find that more than twice as many firms are not complying as are complying. Further, we find the number of non-compliant firms is much larger than the number of firms adjusting out of the regulation. Thus non-compliance with the Factories is a key feature of the "missing middle" in India. We explore the main trends and patterns of non-compliance and highlight a number of key issues for further analytical and policy research.

* The views expressed here are those of the authors and not of any institution they may be associated with.

¹ We thank the seminar participants at CDS-Trivandrum, the Reserve Bank of India and the World Bank, New Delhi, for their comments and feedback.

1. Introduction

The regulatory burden on enterprise is a central topic in policy and popular discourse. Even the use of the word “burden” clearly conveys the tenor the discussion. It is often argued that enterprises are “overburdened” with regulation, and that these regulations impose costs which hinder enterprise productivity and growth. The policy prescription of this line of argument seems clear—to deregulate heavily. And yet the regulations were presumably introduced for a purpose. Economic theory suggests a number of contexts in which regulation can be beneficial to the economy and society as a whole. This line of argument, then, would be cautious about deregulation.

India is no exception to the global debate on regulation. It is common place to find the argument that enterprise registration, labor laws and a multitude of other regulations are stifling enterprise and holding back the efficiency and growth of firms and with it the progress of the economy. A central piece of legislation is India’s Factories Act of 1948, which requires manufacturing enterprises of a certain size to register and thence comply with other regulations. This also defines the “organized” sector in India. The Factories Act is often suggested as one of the reasons for India’s “missing middle” in terms of enterprise size, since the requirement to register starts at 10 workers (20 workers if not using electricity). It is thought to hold back expansion of promising enterprises, inducing them to stay “beneath the radar screen” of the regulation. Yet for supporters of this Act it is an important component of providing protection of workers’ health and safety in the workplace, as well as the bulwark for protection of other worker rights.

It is striking is how little account is taken of non-compliance in these two major strands of argument. Those in favor of regulation argue on the basis of assumed compliance. Those against must also be arguing on the basis of compliance, because presumably non-compliance makes the regulatory burden less. At the extreme, if there is no enforcement and no compliance at all, then it is as though the regulation did not exist. However, if there is partial enforcement then there may be costs of evading the regulation and its enforcement. What should be clear is that without an account of non-compliance, the discourse on regulation is severely incomplete. How much non-compliance is there? Who complies and who does not? How has the extent and pattern of non-compliance changed over time? Without answers to these questions the regulation debate takes place in an unreal theoretical setting which may not match reality on the ground.

The evidence for non-compliance at the enterprise level, in India and globally, is mainly anecdotal. Stories based on individual experience abound. There is limited systematic evidence of the extent, nature and causes of non-compliance. One reason is that it is obviously difficult to ascertain non-compliance, in other words illegality, through a direct survey instrument, which is also needed to get information on possible correlates of non-compliance. However, there are some instances where non-compliance can be identified through indirect means. For example, in the case of minimum wage regulation, labor force surveys or household surveys routinely collect information on wages of the interviewed workers, as well as information on the nature of their employment. By matching the location/sector/occupation of each worker with official

gazetted minimum wages, it can be ascertained whether or not a minimum wage violation is taking place, without ever approaching the enterprise in which the individual works.² But for this very reason these worker based approaches do not have the detailed enterprise level information needed for further firm based analysis of non-compliance.

However, for the Factories Act (1948) in India, there is also an indirect method for determining non-compliance which does not broach illegality directly. Rather, the National Sample Survey Organisation (NSSO) surveys the universe of enterprises which are not registered under this Act and, inter-alia, asks about number of workers and electricity usage, which together define the criterion for required registration under the Act. Using this data source, therefore, non-compliance can be quantified. These quinquennial NSSO surveys have of course been used in the past for a number of purposes, but not in any systematic way to explore magnitudes and patterns of non-compliance.³ In this paper we provide recent estimates for non-compliance and explore some of its patterns. We find non-compliance to be significant. Indeed, as many firms are not complying as are complying. Further, we find the number of non-compliant firms is much larger than the number of firms adjusting out of the regulation. We explore the main trends and patterns of non-compliance and highlight issues for analytical and policy research.

The plan of the paper is as follows. Section 2 reviews the theory of responses to regulation including non-compliance, and provides the frame for our investigation. Section 3 describes the Indian institutional setting and our data set, and presents the main trends on compliers, evaders, avoiders and outsiders to India's Factories Act. Section 4 focuses on non-compliance and explores some key patterns of non-compliance in India. Section 5 concludes with a discussion of policy implications and highlights areas for further analytical and policy research.

2. Theory: Regulation, Compliance and Types of Informality

There is a large literature on the economic theory of (non) compliance with laws and regulation. The empirical literature is more scant, particularly in developing countries, because of the data issues mentioned in the introduction. At one level the theoretical framework is straightforward. Following Becker (1968) the problem for an individual is posed as the balance between the benefits of breaking the law and the costs of doing so. The costs depend on the probability of getting caught, and on the penalty imposed if caught. Tax evasion was among the earliest issues explored in this framework, starting with the work of Allingham and Sandmo (1972); a recent review is provided by Slemrod (2007). In the same spirit, the initial investigation of compliance with minimum wage legislation by Ashenfelter and Smith (1979) has led to a significant theoretical and empirical literature (for recent examples, see Basu, Chau and Kanbur, 2010, and Ronconi, 2010).

² For an application of this method to South Africa see Bhorat, Kanbur and Mayet (2012), and for an application to Chile see Kanbur, Ronconi and Wedenoja (2013).

³ For example, Bedi and Banerjee (2007) and Nagraj (2002).

Within the broad framework outlined in the literature above, we can pose as follows the specific decision for an enterprise on whether or not to register under India's Factory Act of 1948. Let output Y be a function of labor, L , and an entrepreneurial ability or productivity parameter, A . If the production function is $F(L, A)$ and the wage is w then profit, π , in a world without regulation is given by

$$\pi = F(L, A) - wL$$

The firm is assumed to choose employment to maximize profit. There is then a “natural” size distribution of firms by employment size, given by $L(A)$. Standard assumptions ensure that L is increasing in A —more productive firms are larger. Suppose now that a regulation is brought in which requires registration if employment exceeds L^\wedge . Suppose further than registration imposes a fixed cost of T . Then with perfect enforcement profits are

$$\pi = \begin{cases} F(L, A) - wL & \text{if } L \leq L^\wedge \\ F(L, A) - wL - T & \text{if } L > L^\wedge \end{cases}$$

With this framework, we can characterize the patterns of response by firms with different productivity A .

Let A^\wedge be the value of A at which a firm would employ L^\wedge in the unregulated economy. It can then be shown that under certain conditions there exists a value of A , such that $A_1 > A^\wedge$, with the following properties:

- For A greater than A_1 , the firm registers.
- For A between A_1 and A^\wedge the firm puts itself outside the regulation by employing L^\wedge workers.
- For A less than or equal to A^\wedge the firm would employ less than L^\wedge workers even without the regulation, and so is outside the remit of the regulation.

Of course for firms with A less than A^\wedge the regulation does not bite and the pre-regulation size distribution is unchanged. For A greater than A^\wedge employment size is unaffected in this specification because the costs of registration are in the form of fixed costs. The dramatic impact is on firms with intermediate levels of productivity, who reduce employment and output to come out of the regulation net.⁴ This is, indeed, the “missing middle” which has been much discussed, particularly in the Indian context.⁵

Now consider the situation where there is at least some enforcement of the regulation. This can be modeled, and is usually modeled, with risk neutral enterprises that face an expected cost if they violate the regulation. This is the product of the probability, p , of getting caught and the penalty, C , if caught. If p and C both depend on L , the firm's profit function, π , has several components:

⁴ For a similar argument in the context of taxation thresholds, see Chatterjee and Wingender (2012)

⁵ Mazumdar and Sarkar (2008)

$$\pi = \begin{array}{ll} F(L, A) - wL & \text{if } L \leq L^{\wedge} \\ F(L, A) - wL - T & \text{if } L > L^{\wedge} \text{ and registration} \\ F(L, A) - wL - p(L)C(L) & \text{if } L > L^{\wedge}, \text{ and no registration} \end{array}$$

The firm now has two decisions to make simultaneously, whether to register and how many workers to employ. The answer clearly depends on the specification of $p(L)$ and $C(L)$ relative to T . For example, if the probability of getting caught is close to one or the penalty is very high then there is no violation of the regulation. If p and C do not depend on L , then to register or not is essentially a comparison of two fixed cost terms T and pC , and all firms either register or do not. However, if $p(L)$ and $C(L)$ are increasing in L , for example, if detection is easier with larger firms or if the penalty for non-registration is higher for larger firms, then it can be shown that there are intermediate ranges of p , T and C where under certain conditions there exist values of A , $A_1 > A_2 > A^{\wedge}$ with the following properties⁶:

- For A greater than A_1 , the firm registers.
- For A between A_1 and A_2 , there is non-compliance--firm is required to register but does not and is thus illegal.
- For A between A_2 and A^{\wedge} the firm puts itself outside the regulation by employing L^{\wedge} workers.
- For A less than or equal to A^{\wedge} the firm would employ less than L^{\wedge} workers even without the regulation, and so is outside the remit of the regulation.

The intuition behind these ranges is straightforward. Clearly for A less than or equal to A^{\wedge} , in other words for those firms which would employ less than L^{\wedge} workers in a world without regulation, the regulation does not bite and the size distribution is unaffected as before. For A above A^{\wedge} a fixed cost of T is paid if registered, and a cost of $p(L)C(L)$ if not registered. Whatever the relative values of these two, for A slightly above A^{\wedge} both of these are large enough to make it worthwhile to move out of regulation altogether by employing L^{\wedge} workers. As A^{\wedge} rises so does the return from employing more workers. As the productivity threshold of A_2 is crossed it is worthwhile to hire more than L^{\wedge} workers, whether with registration or not. However, $p(L)$ and $C(L)$ are still small enough relative to T to make it worthwhile to violate the regulation. As productivity and, thus, firm scale continues to rise beyond the next threshold A_1 , $p(L)$ and $C(L)$ now become so large that they dominate the saving of the registration cost T by not registering. Hence firms above A_2 will always register.

Suppose, for example, that L^{\wedge} is 10 workers. Then the theory suggests that enterprises can be classified into four categories:

- Enterprises which fall into the ambit of the law and comply. For example, a 20 worker enterprise which registers. These are the “compliers”, who constitute the organized or formal sector.

⁶ There are many papers with variants of these results for different specifications. A recent example is de Paula and Scheinkman (2007). See also Kanbur and Keen (2013) in the context of tax avoidance and evasion. This strand of the literature grows out of the original work of Lucas (1978).

- B. Enterprises which fall into the ambit of the law but do not comply. For example, a 15 worker enterprise which does not comply. These enterprises are operating illegally relative to the law in question. They are the “evaders.”
- C. Enterprises which are not in the ambit of the law but only because they have adjusted out of the scope of the law. For example, a 9 worker enterprise, which would have been a 12 worker enterprise without the regulation. These are the “avoiders.”
- D. Enterprises which are not in the ambit of the law because even their pre-regulation activity would not have been covered by the law. For example, a 2 worker enterprise. We might call these the “naturally informal.” Another label for them would be the “outsiders.”

The argument above gives a new twist to the “missing middle” thesis. It says that there are two phenomena to look for in the middle of the “natural” size distribution. The first is a movement out of the middle to avoid registration costs. The second, however, is non-compliance to evade registration costs. Alongside the “missing” middle is then the “present” but non-compliant middle.

With this conceptual backdrop, we now move to examine the extent and nature of non-compliance with India’s Factories Act (1948).

3. **Compliers, Evaders, Avoiders and Outsiders**

The Factories Act (1948) states that all enterprises in manufacturing who use electricity and have 10 workers or more, and all enterprises with 20 workers or more who do not use electricity, are required to register. Registered enterprises are referred to as the organized (“formal”) sector. Information about registered enterprises is gathered through the Annual Survey of Industries (ASI). Every five years the National Sample Survey Organisation (NSSO) conducts a survey of enterprises that are **not** registered under the Factories Act, in other words, of the “unorganized” sector. The survey collects a large amount of information on these enterprises, including the number of workers and electricity usage. It is possible, therefore, to analyze the extent and nature of non-compliance with the Factories Act using this information.

Although the “shorthand” characterization of the organized sector is often in terms of “10 workers or more”, as noted above the actual Act also has a differentiation between enterprises who do and who do not use electricity—for those who do not, the threshold is 20 workers or more. However, we argue in Appendix A that the electricity use criterion, important though it may have been in 1948, is increasingly irrelevant. In what follows we will define formality using just the “10 workers or more” criterion.

Given the two data sources, we can quantify the size of categories A, B, C and D. Category A firms are those that have registered under the Factory Act, which are to be

found in the ASI data.⁷ Category B firms are those in the NSSO survey who have 10 workers or more. These firms should have registered but have not done so. Category C presents a particular difficulty because it is based on a counterfactual—how exactly do enterprises adjust out of the regulation? However, we can argue as follows based on the theory of the previous section. If an enterprise would have had 10 workers or more without the regulation but now wishes to adjust out and come in “just below the radar”, then it would adjust down to just below 10—in other words, 9 workers. Thus the observed number of firms in the NSSO survey in the 9 worker category will give us an overestimate of Category C, since some of the 9 worker firms in the NSSO could be “naturally” of size 9 and will not have adjusted out of the regulation. There is then a corresponding underestimate of Category D. With these definitions, we now move to an examination of the levels and trends in the different categories of firms.

Table 1 presents the magnitudes and characteristics of groupings A, B, C and D for using the 2009-10 ASI and the 2010-11 NSSO surveys⁸. It is seen that the formal sector (A) accounts for 0.8% of all firms⁹ and 24.8% of all manufacturing employment. The informal sector thus accounts for 75.2% of employment in this data. As between different types of informality, the evaders, (B), account for 91.5% and the avoiders (C) account for at most 0.4% of enterprises. The vast majority of enterprises, 97.3% are in category D—the “outsiders.” Further, the figure in Table 1 is an underestimate of this category since not all of those currently classified in category C are necessarily “avoiders.” The outsiders account for 64.1% of all employment, again an underestimate. Thus, the Factories Act directly affects firms that employ at most 35.9% of workers (categories A, B and C). Of the informal sector employment as a whole (B, C and D), the evaders account for 13.0% of workers, the avoiders account for at most 1.7%, and the outsiders account for the balance of 85.2%.

⁷ Interestingly, and perhaps somewhat surprisingly, there are a significant number of firms in the ASI who have less than 10 workers—these firms do not need to be registered but are nevertheless registered. This phenomenon has been noted before, for example by Bedi and Banerjee (2007). One explanation for this might be that they were once registered but have not bothered to or managed to deregister, or are still erroneously being carried on the register. Characteristics of these firms are set out in Appendix B.

⁸ We use enterprise data from the ASI 2009-10 and the NSSO 2010-11 surveys. The survey period for the ASI was from October 2010 to April 2011 and for the NSSO from July 2010 to June 30 2011.

⁹ A factory unit is defined as firm here.

Table 1: Compliers, Evaders, Avoiders and Outsiders under the Factories Act, 1948, in 2009-10*				
Firm Characteristics	Firm Categories			
	A	B	C	D
	ASI Firms	NSSO Firms with 10 or employees	NSSO Firms with 9 employees	NSSO Rest
Number of Firms	143,452	256,993	67,249	16,900,000
Share of Firms	0.8%	1.5%	0.4%	97.3%
Total Employment**	11,500,000	4,543,668	605,245	29,700,000
Share of Employment	24.8%	9.8%	1.3%	64.1%
Mean Employment	79.9	17.7	9.0	1.8
Median Employment	21	13	9	1
Median Labor Productivity (Rupees)****	135,626	59,820	74,000	23,400
<p>* Usage of power is ignored and only the criteria of 10 or more employees is considered for registration under the Factories Act, 1948. Excludes firms with missing or zero employment.</p> <p>**Includes unpaid family members/helpers working in the firm.</p> <p>***Capital here is defined as the value (market value for NSSO and book value for ASI) of assets at the end of the year</p> <p>****Labor productivity is total gross value added divided by total employment</p>				

From the 2010-11 NSSO survey, 256,993 firms had 10 workers or more but were not registered. This compares with 143,452 firms registered under the Act, as shown by the ASI for 2009-10. Thus more firms appear to be non-compliant than compliant with the law. Non-compliant firms formed a staggering 64.2% of compliant and non-compliant enterprises. However, non-compliant enterprises are much smaller—a mean size of 17.7 workers compared to 79.9 workers for compliant enterprises. The total number of workers employed by these non-compliant enterprises was 4,543,668. This compares with 11,500,000 workers employed by all registered firms as shown in the ASI. In other words, unregistered enterprises accounted for 28.3% of the labor force of compliant and non-compliant enterprises.

How does non-compliance compare to the magnitude of adjustment out of the regulation? In 2010-11 the number of enterprises in the 9 workers category was 67,249, with total employment of 605,245. Thus, even if we attribute *all* of these enterprises to the adjusted out category, their number is less than the number of non-compliant firms, and total employment in them is less than a third of that in non-compliant firms. But these are of course overestimates of adjustment out of regulation since it includes firms who are naturally of size 9. It would seem, therefore, that non-compliance with regulation dominates adjustment out of regulation by a large margin.

Table 2: Compliers, Evaders, Avoiders and Outsiders under the Factories Act, 1948, in 2005-06*				
Firm Characteristics	Firm Categories			
	A	B	C	D
	ASI Firms	NSSO Firms with 10 or employees	NSSO Firms with 9 employees	NSSO Rest
Number of Firms	124,710	248,265	62,980	16,700,000
Share of Firms	0.7%	1.4%	0.4%	97.5%
Total Employment**	8,809,946	4,042,081	566,821	31,800,000
Share of Employment	19.5%	8.9%	1.3%	70.3%
Mean Employment	70.6	16.2	9.0	1.9
Median Employment	20	12	9	2
Median Labor Productivity (Rupees)***	81,884	32,748	37,744	9,432
<p>* Usage of power is ignored and only the criteria of 10 or more employees is considered for registration under the Factories Act, 1948. Excludes firms with missing or zero employment.</p> <p>** Includes unpaid family members/helpers working in the firm.</p> <p>*** Labor productivity is total gross value added divided by total employment</p>				

Some idea of the trends is given by comparing the 2010-11 NSSO survey and 2009-10 ASI with the 2005-06 NSSO survey and ASI in (Table 2). Share of formal firms went from 0.7% of all firms to 0.8% over this five year period, and their employment share increased from 19.5% to 24.8%. Thus, the employment share of total informality (B, C and D) declined correspondingly. The employment share of non-compliant firms (B) went from 8.9% to 9.8%, a clear upward trend. The share of employment of the avoiders (C) does not seem to have changed at all, while the share of the outsiders (D) went down from 70.3% to 64.1%. In 2005-06 the number of non-compliant enterprises was 248,265 compared with 124,710 compliant enterprises, a share of 66.7%, compared to a share of 64.2% in 2010-11. The corresponding share of the workforce was 31.5% in 2005-06, compared to 28.3% in 2010-11. There is thus only a very slight downward trend in this ratio of non-compliance to compliance, but it remains very high.¹⁰

Focusing on 2009-10 (the patterns are similar for 2005-06) it is seen that the average size of enterprise falls from A through D—from 79.9 to 17.7 to 9 to 1.8. However, the standard deviation of employment is high, especially with the larger sized firms. The median in such cases becomes a better average for comparison. The trend of falling average employment from A to D holds true even for the median. The average labor productivity, measured as gross value added divided by total persons employed, of firms in category A is more than twice that of the firms in category B and C and nearly six times that of the firms in D.

¹⁰ Referring to a much earlier period, Nagraj (2002) finds that “In 1980, 53 percent of factories employing 10 or more workers did not register themselves under the Act. This proportion increased to 58 per cent in 1990”.

4. Compliance versus Non-Compliance

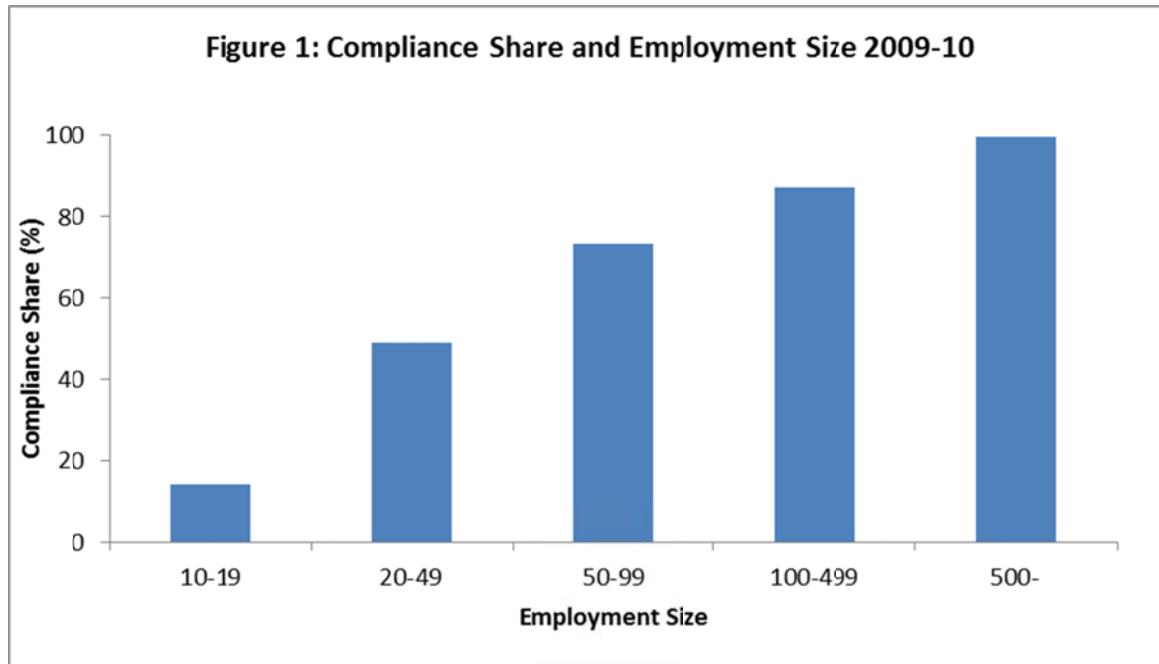
The previous section showed the significant amount of non-compliance with India's Factories Act. Further, it showed that non-compliance is a phenomenon that is much larger than the phenomenon of adjusting out of regulation. In this section we will focus specifically on compliance versus non-compliance. For this exercise our universe is all firms with 10 workers or more, either in the ASI data set or in the NSSO data set.¹¹ Those in the ASI data asset are compliant, and those in the NSSO data set are non-compliant.

Table 3: Compliance under the Factories Act, 1948, in 2009-10*		
	Compliant	Non-Compliant
Number of Firms	114,278	256,993
Share of Firms	30.8%	69.2%
Total Employment**	11,300,000	4,543,668
Share of Employment	71.3%	28.7%
Mean Employment	98.8	17.7
Median Employment	30	13
Median Labor Productivity (Rupees)****	151,754	59,820
Median Capital-Output Ratio***	0.2	0.5
Median Capital-Labor Ratio (Rupees)***	166,727	68,947
Median Wage Rate (Rupees)	61,247	39,460
Median Gross Value Added Share in Total Output	20.0%	59.2%
Ownership Type (%)		
Sole Proprietory	24%	86%
Partnership	32%	12%
Limited Co	41%	0%
Others (Co-operatives, SHG etc)	3%	2%
Location (%)		
Rural	39%	43%
Urban	61%	57%
Maintain Books of Accounts (%)	100%	50%
Median Age (years)	12	6
<p>* Usage of power is ignored and only criteria of 10 or more employees is considered for registration under the Factories Act, 1948.</p> <p>**Includes unpaid family members/helpers working in the firm</p> <p>***Capital here is defined as the value (market value for NSSO and book value for ASI) of assets at the end of the year</p> <p>****Labor productivity is total gross value added divided by total employment</p>		

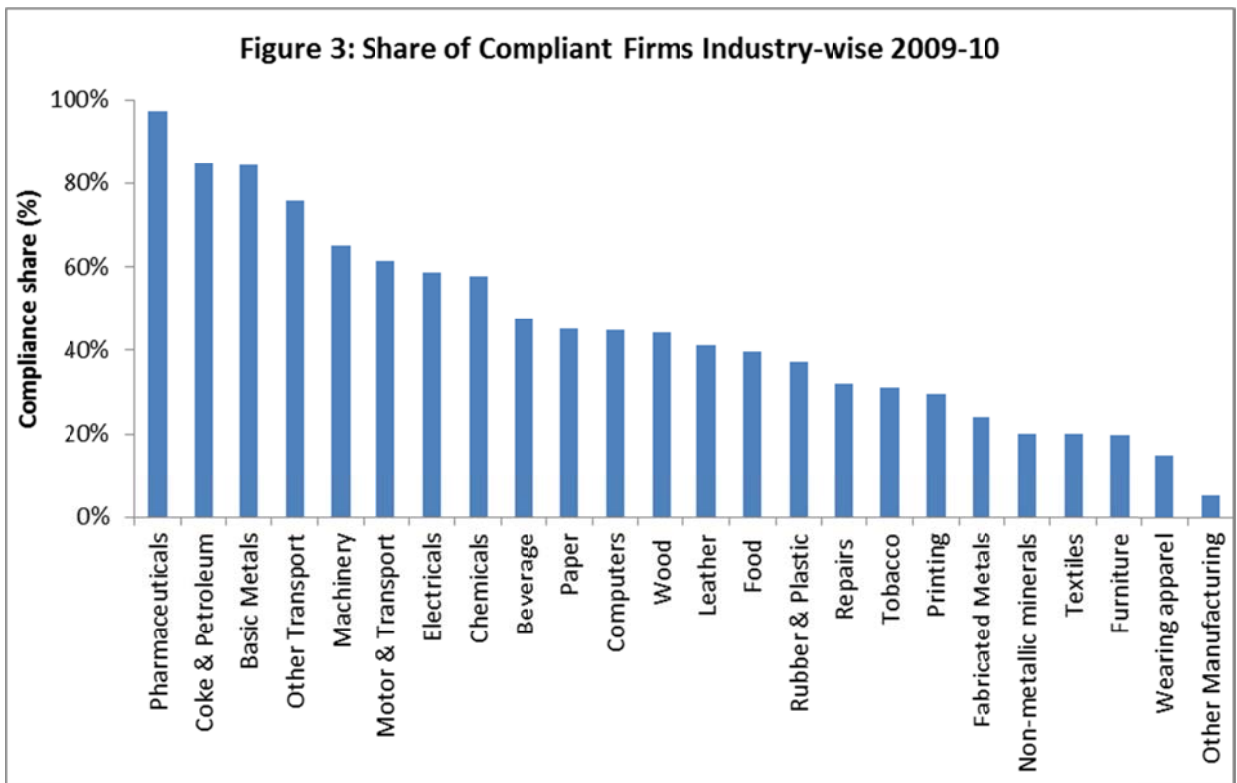
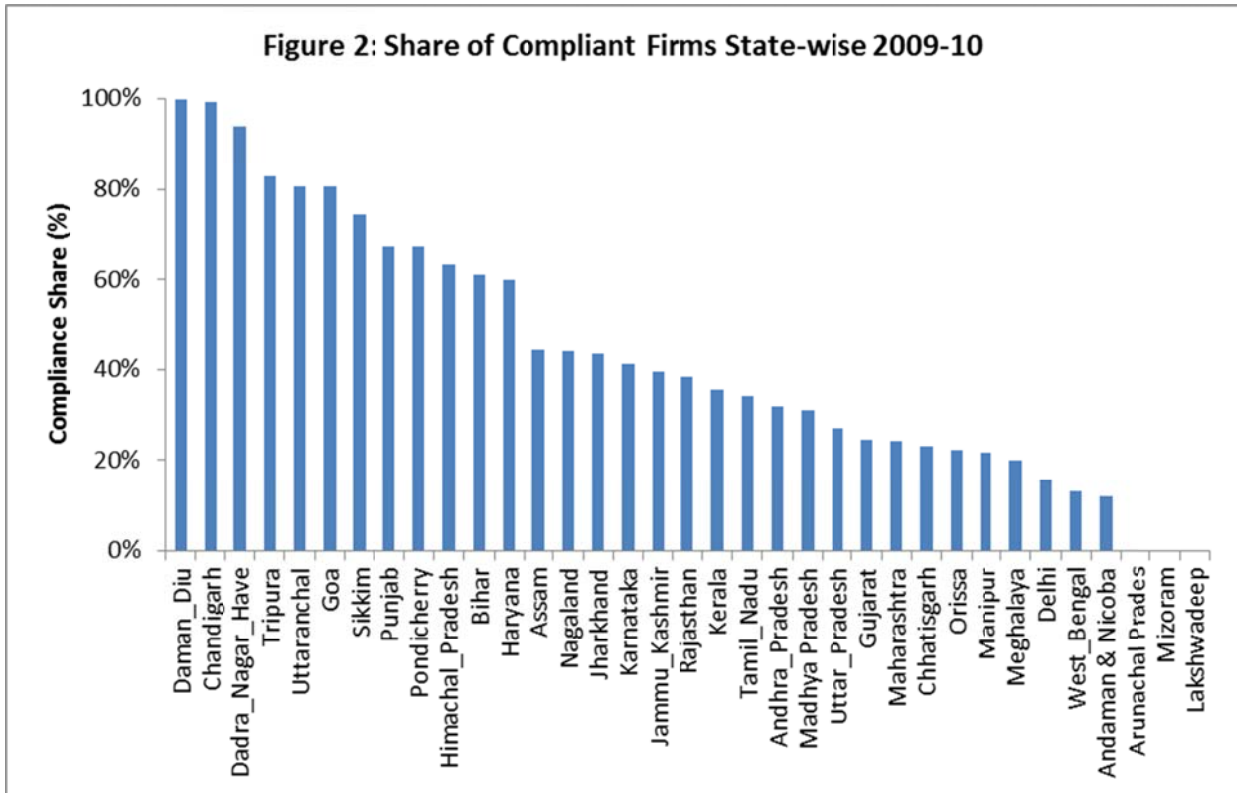
¹¹ Recall that in the ASI there are a significant number of enterprises who have less than 10 workers, although these are very small and do not account for a large share of employment among ASI firms (only 1.5%, see Appendix B). These enterprises are excluded from the analysis of this section.

Table 3 presents the basic data on compliant and non-compliant firms from this universe of enterprises. From this universe, only 30.8% are compliant. In terms of location, 57% of non-complying firms are urban, compared to 61% of the complying firms—the phenomenon thus seems roughly equally spread across the rural-urban divide. However, complying firms are significantly older, with a median age of 12 years compared to 6 years. Finally, there are significant differences in ownership type across the two types of firms, with sole proprietorships dominating among the non-compliers, and limited companies and partnerships dominating among the compliers.

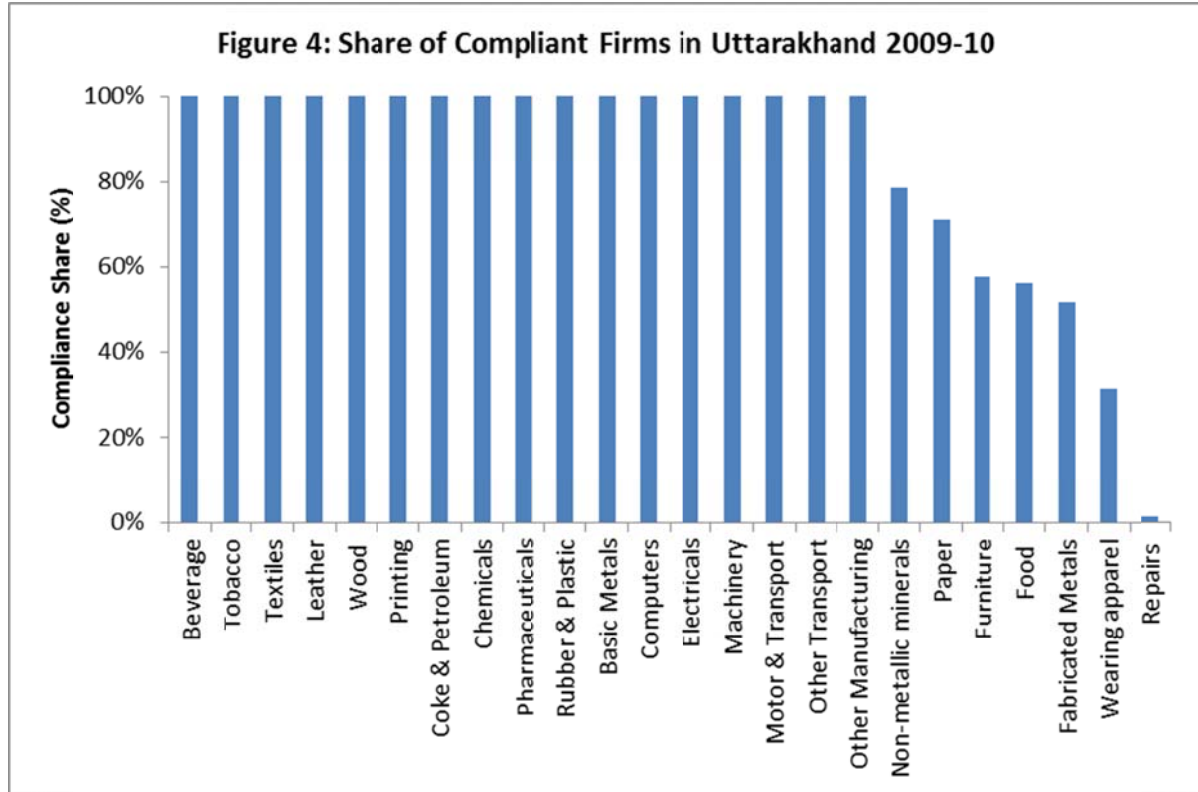
Compliant firms are much larger, with mean employment of 98.2 compared to 17.7 for non-compliant firms. The shares of employment are thus reversed—71.3% for compliant firms and 28.7% for non-compliant firms. Figure 1 shows that there is a positive association between size and compliance. Compliance rates go from 15.1% for the smallest size category of 10-19 workers, to close to 100% for the largest size category of more than 500 workers, with increase in compliance as size increases in between these two categories.

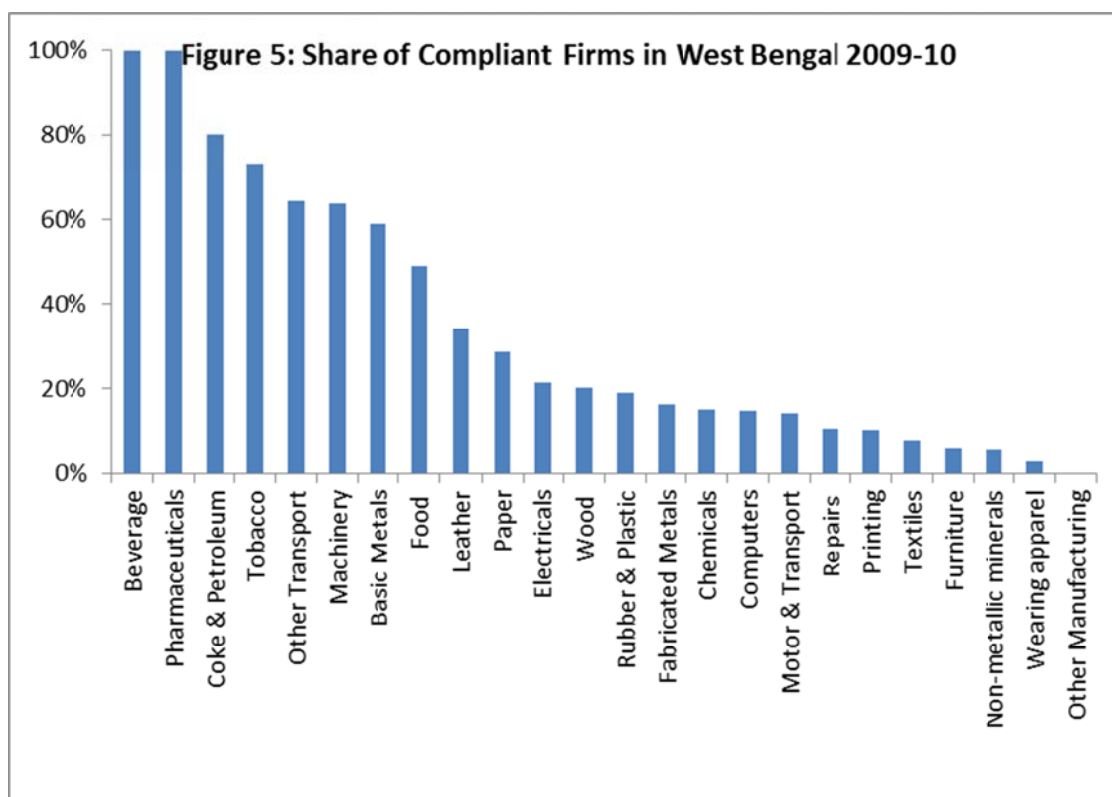


We turn now to patterns of compliance across states and across industry. Figure 2 shows the compliant firms as a fraction of firms required to register, by state. It is seen that there are large variations, with good performance in states like Chandigarh and Uttarakhand but very weak performance in states like Delhi and West Bengal. One reason for these state patterns could be the nature of industrial composition. Figure 3 shows that there is a clear industrial pattern in compliance, with pharmaceuticals registering close to full compliance, going to compliance rates of around 20% in Textiles, Furniture and Wearing Apparel.



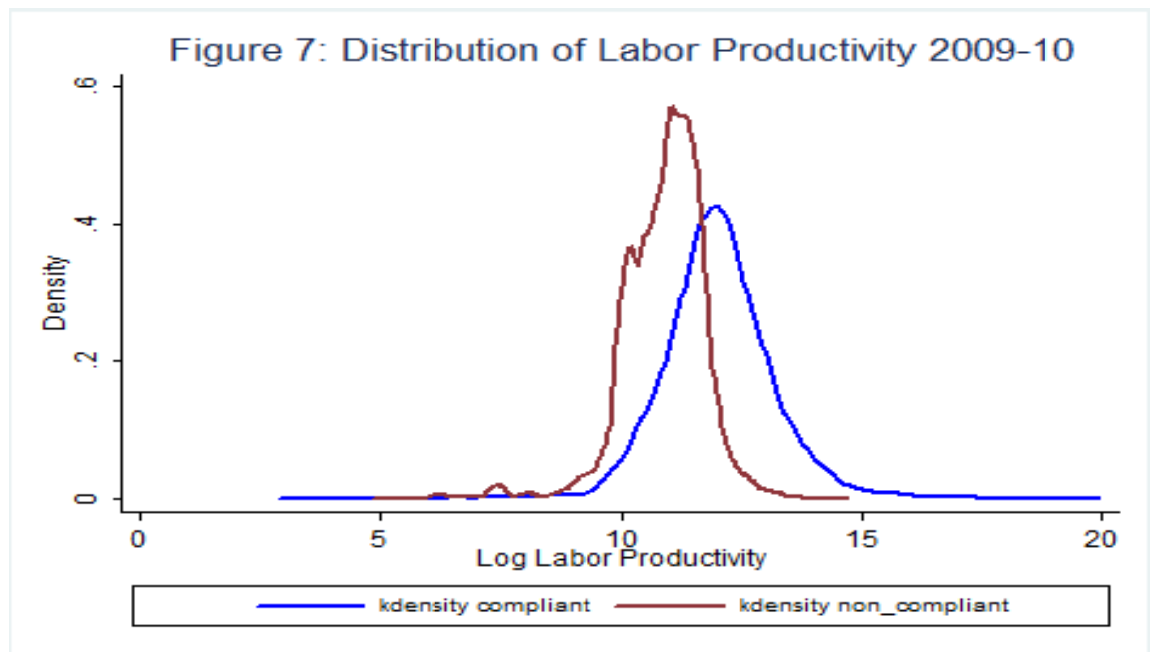
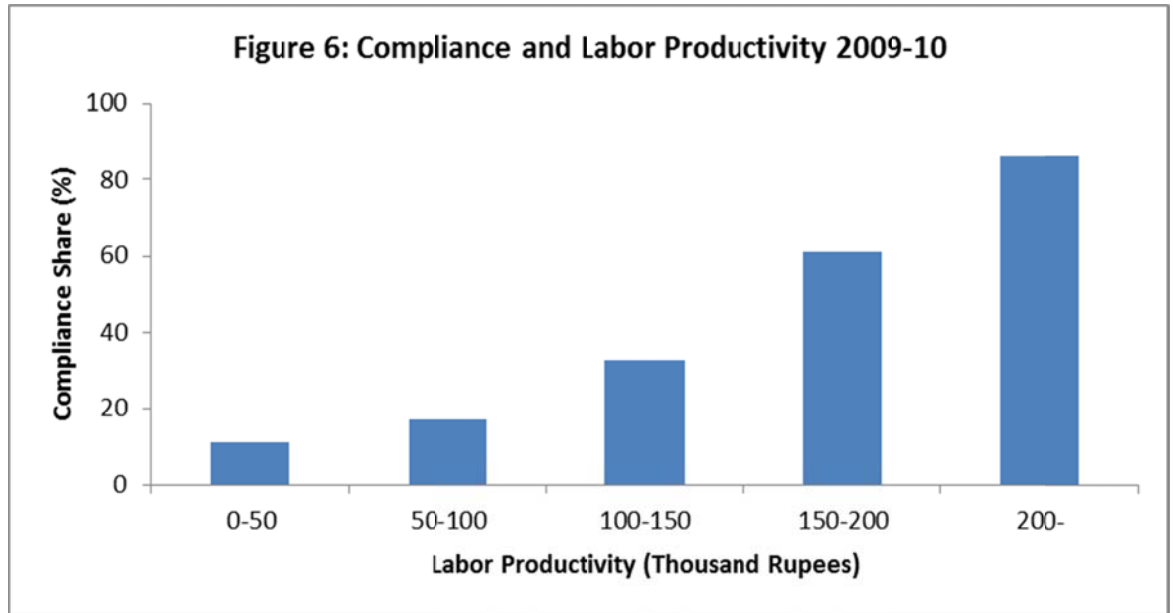
Figures 4 and 5 compare industry wise compliance in Uttarakhand and West Bengal, respectively. The Figures suggest that the state effect is indeed strong. Uttarakhand shows strong compliance across a range of industries which do not necessarily have strong compliance rates nationwide. However, the industry effect is present as well, with drop offs in compliance industries which are also doing badly at the national level, like Weaving Apparel, Food or Furniture. An interaction between industry and state is seen in Figure 5 for West Bengal, which performs better than national average on some industries, although of course lower than the national average on most industries.





These patterns of non-compliance will be related to a range of costs and benefits of compliance which vary across state and industry, but they raise the important issue of differing levels of enforcement. The theory suggests that the probability of getting caught and the costs of apprehension are key determinants of non-compliance. The literature uses resources devoted to enforcement as an explanatory variable in explaining patterns of non-compliance. In the Indian case this would need data on Factories Act inspectors, and other budgetary items, by state. Further, there is an endogeneity issue to be addressed in attributing causality to an association between enforcement resources and enforcement outcomes, since the allocation of enforcement resources to a state or an industry may be a function of the non-compliance rate to begin with. Thus enforcement resources will have to be instrumented appropriately in the econometrics, as is done in Ronconi (2010) for Latin America, and in Bhorat, Kanbur and Mayet (2012) for South Africa. This is an interesting and important item on the research agenda.

Not only are compliant firms larger, they have higher labor productivity, by a factor of more than 2.5. They also have a correspondingly higher capital-labor ratio and output-capital ratio. The association between labor productivity and compliance is shown in Figures 6 and 7. There is a strong positive correlation between compliance and productivity. The kernel density of labor productivity of compliant firms is a rightward shift of the density for non-compliant firms.



The association between productivity and compliance, and also between size and compliance, is consistent with the predictions of the theory developed in Section 2. From a policy perspective, however, the interesting question is whether non-compliance per se reduces size and productivity, allowing for the selection effect that less productive and smaller firms are likely to not comply. Correcting for this selection effect requires us to have a sufficient number of credible variables that can capture exogenous entrepreneurial ability, “A” in the theory of Section 2, and a data set that allows sufficient matching of firms similar on ability some of which can be argued to be selected randomly into compliance and others into non-compliance.

Unfortunately, this does not seem to be a plausible exercise for the Factories Act. The two complementary data sets which allow us to quantify the magnitude of compliance versus non-compliance are collected for different purposes and under different protocols. This is useful in identifying non-compliance, because the issue of illegality is not broached in the NSSO survey. However, the two data sets do not have a sufficient number of variables in common which can be plausibly identified with exogenous entrepreneurial ability, and which when applied lead to a credible matching process¹².

5. Conclusion

This paper has explored the magnitude and patterns in non-compliance with India's Factories Act, a key piece of legislation which is the anchor for the distinction between the "organized" and the "unorganized" sectors. It begins by arguing that responses to regulation fall into four categories—compliers, evaders, avoiders and outsiders. Using two complementary data sources the paper provides recent estimates and trends for the number of enterprises each of these categories. The central conclusion is that non-compliance is significant. The number of non-compliant firms (Evaders) exceeds the number of compliant firms, and it exceeds an upper bound estimate of the number of firms who have adjusted out of the regulation (Avoiders). However, the category of firms that are not affected by the regulation at all, (Outsiders), far exceeds all other categories put together.

Our paper is also a contribution to the "missing middle" literature. The Factories Act is one of the candidate explanations for the lack of medium size enterprises in the size distribution of manufacturing firms in India. Our analysis presents a specific estimate of the contribution of the Factories Act to this phenomenon. Furthermore, it distinguishes between and quantifies two aspects of the missing middle—enterprises who adjust out of the regulation and enterprises who evade the regulation. Clearly, the analysis needs to be quite different for these two types of the "missing middle."

The extent of non-compliance raises the question of enforcement. We have shown considerable variation in non-compliance across industries and across states. The impact of enforcement resources on compliance is thus an interesting research question. It is also an important question since such widespread non-compliance can undermine trust and belief in the legal and regulatory system. How can one make sense of non-enforcement of a regulation by a government which has itself passed that regulation? Of course enforcement costs are a possible explanation as are the preferences of the government, as suggested by the theory in Basu, Chau and Kanbur (2010). Responses to the Factories Act present an opportunity to test these theories of optimal enforcement, and this is an interesting area for further research.

¹² We have been more successful with this exercise for the Employees Provident Fund Act, 1952, because compliance and non-compliance can be identified in the same data set. These results are described in Chatterjee and Kanbur (2013).

However, if the regulation itself is thought to be inappropriate, then perhaps no enforcement is the best answer. This takes us into the current debates on regulation and its impact on informality and productivity. The policy discourse on regulation has been tied up with views on the magnitude and nature of informality, and its consequences for growth and efficiency. Thus, for example, *The Economist* (September 9, 2010), in a survey of Latin America, argues as follows:

“Thanks largely to baroque regulation, half the labor force toils in the informal economy, unable to reap the productivity gains that come from technology and greater scale.”

This statement contains theory (regulation is the cause of informality), an estimate of the magnitude (half the labor force). However, it attributes the whole of informality to regulation, whereas the theory of Section 2 says that it is the evaders and the avoiders who are responding out of the regulation. The outsiders were not affected by it in the first place. As Chen and Doane (2008) argue in their review of South Asia:

“...labor market rigidities alone cannot explain the extent of informal employment...”.

For India’s Factories Act this paper shows that the outsiders account for 97.3% of firms and at least 64.1% of employment. The evaders and the avoiders between them account at most for 1.9% of firms and 11.1% of employment. The focus on (de)regulation as a route to employment and productivity growth therefore has to be balanced with a focus on improving the productivity of those enterprises which would not be affected greatly, or at all, by the regulation in question.

Of course the issue of the impact of regulation on productivity of those enterprises affected by it is still an important policy question. Unfortunately, it does not seem to be possible using the existing data to credibly quantify this effect for India’s Factories Act. The reason is that the data sources for those who register under the Factories Act and those who do not are different. The difference in data sources and protocols gives us confidence that we are getting accurate information from those who are not registered—for example, the issue of illegality is not broached for those who are not in compliance with the Factories Act. But the two data sources do not have a sufficient number of common variables to capture exogenous variation in productivity or entrepreneurial ability, and the problem of selection into non-compliance or into avoidance cannot be addressed credibly.

The issue of selection could be handled for other regulations and matching data sources—Chatterjee and Kanbur (2013) show what can be done for India’s Employees Provident Funds Act, 1952. But such analysis depends on the fortuitous confluence of regulation and data sources, and even then may not be fully credible because the data itself has been collected under particular administrative protocols. What this suggests is the importance of developing a data set devoted to the task of addressing the impact of regulation on firm size and productivity. Given the significance of the current debates on regulation, such investment in information would clearly be worthwhile.

Appendix A: On the Electricity Usage Criterion

The Factories Act requires registration for enterprises with a) 10 or more workers with power b) 20 or more workers. So, for establishments with power, the 10 workers or more criteria applies, while for establishments without power, 20 or more workers is the threshold. The electricity usage criterion was likely relevant seven decades ago when the Act was passed, but what is the situation today?

Let us start by considering the 2010-11 round of NSSO enterprise survey. After excluding firms that report missing employment numbers, we find that there are an estimated 3,239 firms that report 0 electricity expenses in the NSSO 2010-11 survey. The maximum employment reported by these firms was 4 and the median was 1. With this information, the electricity usage criterion is irrelevant. The “10 workers or more” criterion for identifying compliance is sufficient. However, electricity usage information is missing for about 5.1 million firms. Out of which, nearly 99.4% have employment size of less than 10. The remaining 29,864 firms, account for 11.6% of the firms with 10 or more employees in the NSSO. Of course, if electricity usage was positive for these enterprises then there would be no difference when compared to using just the “10 workers or more” criterion for identifying informality and ignoring electricity usage—we would be back to Table 1 of the main text of the paper.

A difference would arise if some of the enterprises in the 10-19 worker range did not use electricity. Table A1 presents the number of firms and workers in categories A, B, C and D when missing electricity is set equal to 0. Let us now compare this with Table 1. It is seen that even with the extreme assumption embodied in Table A1, for category B the discrepancy in the number of firms is 22,469 and the discrepancy in the number of workers is 290,996. That is, by ignoring electricity usage we may be over estimating the number of firms in category B (Evaders) and their total employment by at most by 8.7% and 6.4% respectively. Similarly for category C (Avoiders) we may be overestimating the number of firms and total employment by 8.4% and 7.2% respectively. The discrepancies are quite small. Further, the average characteristics of the different categories are not very different from each other.

Although not presented here, the discrepancies for 2005-6 are 12.5% (firms) and 9.5% (workers), and the average characteristics do not differ very much either. For 2000-01 there are no missing values but the discrepancies between the two criteria lead to a discrepancy in the numbers for category I of 15.5% (firms) and 12.0% (workers).

We would argue, therefore, the electricity use criterion, important though it may have been in 1948, is increasingly irrelevant. Ignoring it is unlikely to affect our analysis of compliance greatly.

Table A1: Compliers, Evaders, Avoiders and Outsiders under the Factories Act, 1948, in 2009-10, where missing electricity expenditure is assumed to be zero.

	Firm Categories			
	A	B	C	D
	ASI Firms	NSSO Firms with 10 or more employees using power and 20 or more not using power	NSSO Firms with 9 employees using power and 19 employees not using power	NSSO Rest
Firm Characteristics				
Number of Firms	143,452	234,524	61,575	16,900,000
Share of Firms	0.8%	1.4%	0.4%	97.5%
Total Employment*	11,500,000	4,252,672	561,756	30,100,000
Share of Employment	24.8%	9.2%	1.2%	64.9%
Mean Employment	79.9	18.1	9	1.8
Median Employment	21	13	9	1
Median Labor Productivity (Rupees)**	135,626	63,915	76,400	23,400

*Includes unpaid family members/helpers working in the firm

**Labor productivity is total gross value added divided by total employment

Appendix B: Firms in ASI with less than 10 workers

Table B1: Firms with less than 10 employees in the ASI 2009-10		
Number of Firms		29,174
Share in Total ASI		20.3%
Total Employment**		172,858
Share in total ASI Employment		1.5%
Mean Employment		5.9
Median Employment		6
Median Labor Productivity (Rupees)****		88,433
Median Capital-Output Ratio***		0.2
Median Capital-Labor Ratio (Rupees)***		138,457
Median Wage Rate (Rupees)		42,175
Median Gross Value Added Share in Total Output		21%
Ownership Type (%)		
	Sole Propreitory	52%
	Partnership	34%
	Limited Co	13%
	Others (Co-operatives, SHG etc)	1%
Location (%)		
	Rural	35%
	Urban	65%
Maintain Books of Accounts (%)		100%
Median Age (years)		16
<p>* Usage of power is ignored and only the criteria of 10 or more employees is considered for registration under the Factories Act,1948. Excludes firms with missng or zero employment.</p> <p>**Includes unpaid family membes/helpers working in the firm.</p> <p>***Capital here is defined as the value (market value for NSSO and book value for ASI) of assets at the end of the year</p> <p>****Labor productivity is total gross value added divided by total employment</p>		

References

- Allingham, Maurice, and Agnar Sandmo. 1972. "Income Tax Evasion: A Theoretical Analysis." *Journal of Public Economics*, November, 1(3-4): pp. 323-38.
- Ashtenfelder, O and Smith, R. 1979. "Compliance with the minimum wage law," *Journal of Political Economy*, April 1979, 2, pp. 333-350.
- Basu, A. Chau, N. and Kanbur, R. 2010. "Turning a Blind Eye: Costly Enforcement, Credible Commitment, and Minimum Wage Laws," *The Economic Journal*. Vol. 120, Issue 543, pp. 244--269.
- Becker, Gary S. 1968. "Crime and Punishment: An Economic Approach." *Journal of Political Economy*, March-April, 76(2), pp. 169-217.
- Bedi, Jatinder S. and Purnendu K. Banerjee. 2007. "Discrepancies and Validation of Indian Manufacturing Data." *Economic and Political Weekly*, pp. 883-891.
- Bhorat, Haroon, Kanbur, Ravi and Mayet, Natasha. 2012. "Minimum Wage Violation in South Africa," *International Labour Review*, Vol. 151, No. 3, pp. 277.
- Chatterjee, Urmila and Phillpe Wingender. 2012. "Tax Threshold and Bunching: Evidence from Indian Firms." Processed.
- Chatterjee, Urmila and Kanbur, Ravi. 2013. "Non-compliance and Productivity: Evidence from India's Employees Provident Fund Act." Processed.
- De Paula, Aureo, and Jose J. Scheinkman. 2007. "The Informal Sector," NBER Working Paper 13486. <http://www.nber.org/papers/w13486.pdf>
- Kanbur, Ravi, Lucas Ronconi and Leigh Wedenoja. 2013. "Labor Law Violations in Chile", <http://kanbur.dyson.cornell.edu/papers/Kanbur-Ronconi-Wedenoja-Labor%20Law%20Violations%20in%20Chile%207Feb2013.pdf>, forthcoming in *International Labour Review*.
- Kanbur, Ravi and Michael Keen. 2013. "Partitions of Tax Compliance," in process.
- Lucas, R., 1978, "On the Size Distribution of Business Firms", *Bell Journal of Economics*, 9, pp. 508-523.
- Mazumdar, Dipak and Sandeep Sarkar. 2008. "The Employment Problem in India and the Phenomenon of the Missing Middle," <http://webapp.mcis.utoronto.ca/ai/pdfdoc/DualismAndEconomicGrowthInIndia.pdf>
- Nagraj, R. 2002. "How to Improve India's Industrial Statistics." *Economic and Political Weekly*, Vol .37, No. 10, pp. 966-970.

Ronconi, Lucas. 2010. "Enforcement and Compliance with Labor Regulations", in *Industrial and Labor Relations Review*, Vol. 64, No. 4, pp. 719-736.

Slemrod, Joel. 1972. "Cheating Ourselves: The Economics of Tax-Evasion." *Journal of Economic Perspectives*, Volume 21, No 1, pp 25-48.

OTHER A.E.M. WORKING PAPERS

WP No	Title	Fee (if applicable)	Author(s)
2014-04	Urbanization and Agglomeration Benefits: Gender Differentiated Impacts on Enterprise Creation in India's Information Sector		Ghani, E., Kanbur, R. and S. O'Connell
2014-03	Globalization and Inequality		Kanbur, R.
2014-02	Should Mineral Revenues be Used for Countercyclical Macroeconomic Policy in Kazakhstan?		Kyle, S.
2014-01	Performance of Thailand Banks after the 1997 East Asian Financial Crisis		Mahathanaseth, I. and L. Tauer
2013-20	What is a "Meal"? Comparing Methods to Determine Cooking Events		Harrell, S., Beltramo, T., Levine, D., Blalock, G. and A. Simons
2013-19	University Licensing of Patents for Varietal Innovations in Agriculture		Rickard, B., Richards, T. and J. Yan
2013-18	How Important Was Marxism for the Development of Mozambique and Angola?		Kyle, S.
2013-17	Social Protection, Poverty and the Post-2015 Agenda		Fiszbein, A., Kanbur, R. and R. Yemtsov
2013-16	Impacts of local food system activities by small direct-to-consumer producers in a regional economy: a case study from upstate NY		Schmit, T.M., Jablonski, B.B.R. and Y. Mansury
2013-15	The Operational Dimensions of Results-Based Financing		O'Brien, T. and R. Kanbur
2013-14	Identifying Factors Influencing a Hospital's Decision to Adopt a Farm-toHospital Program		Smith, II, B., Kaiser, H. and M. Gómez
2013-13	The State of Development Thought		Currie-Alder, B., Kanbur, R., Malone, D. and R. Medhora
2013-12	Economic Inequality and Economic Development: Lessons and Implications of Global Experiences for the Arab World		Kanbur, R.

Paper copies are being replaced by electronic Portable Document Files (PDFs). To request PDFs of AEM publications, write to (be sure to include your e-mail address): Publications, Department of Applied Economics and Management, Warren Hall, Cornell University, Ithaca, NY 14853-7801. If a fee is indicated, please include a check or money order made payable to Cornell University for the amount of your purchase. Visit our Web site (<http://dyson.cornell.edu/research/wp.php>) for a more complete list of recent bulletins.