Tradeoffs...Tradeoffs...Tradeoffs...

How Labor Regulations mediate an Industry's Response to Export Liberalization in India

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Abstract

In this paper, we examine how labor regulations mediated the impact of the phaseout of the Multi-Fiber Agreement restricting India's exports of apparel and textiles. In an environment where it can be tempting to promote flexible labor laws as the panacea for all of India's labor market ills, we present some sobering evidence on average employment and wages. We begin by extending the Garicano et. al (2016) model of a one-sector, one-input economy and examine the interplay between a positive trade shock and labor market regulations. Taking our theoretical underpinnings to the data, we use a difference-in-differences approach to estimate statistically significant increases in average employment and decreases in firm-level average wages for apparel and textile firms in states with flexible labor laws, after controlling for changes over time attributable to being in the apparel and textiles industry or to being in flexible states. We also document an associated rightward shift in the distribution of firm size and firm-level average wages for the apparel and textiles industry, with a greater shift in the distribution of firm-level average wages for firms in states with inflexible labor regulations. Our robust results suggest the need for an examination of mechanisms like capital-intensity and bargaining power that could be driving our results and act as a reminder of the tradeoffs inherent in labor policy design.

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All errors and omissions are mine and mine alone.

To my sister, Peehu.

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Chapter 1

Introduction

After seeing per capita incomes more than sextuple from USD $300 in 1991 to USD $1930 in 2017, driven by trade liberalization and deregulation, India has seen a stark slowdown in recent months. What was once the world's fastest growing major economy has seen that same growth sputter this fiscal year to record its slowest expansion in the past 11 years.[1] Amidst this reversal in fortunes, the country's unemployment rate also reached a forty-year high.[2] With 4.75 million Indians entering the labor force each year, what was once hailed as a 'demographic dividend' threatens to turn into an unmitigated 'demographic disaster'.

There is thus understandably a clamor for India to reduce tariff and non-tariff barriers to trade in pursuit of export-oriented growth, which has been shown to have driven increases in employment in multiple settings (Revenga 1992; Goldberg and Tracy 2003; Almeida and Poole 2017). At the same time, there is a push towards

[1] "India's Economy Expanded 4.7% in Last Quarter" The Wall Street Journal. February 28, 2020. https://www.wsj.com/articles/indias-economy-expanded-4-7-in-last-quarter-11582896117, accessed on March 7, 2020

[2] "Modi's World: See What India's Economy Has Done in Five Years" The Wall Street Journal. April 22, 2019. https://www.wsj.com/articles/modis-world-see-what-indias-economy-has-done-in-five-years-11555925401, accessed on March 7, 2020

adapting India's labor laws to help maximize the effects of such liberalization.[3]In this context, this paper tries to understand the labor regulations under which such an export liberalization can drive the greatest benefit for labor, as measured by its effects on employment and wages. We focus our attention on two important questions. First, how do labor regulations mediate the effect of export liberalization on employment and wages? And second, how do they mediate the effect on the distribution of firm size and wages?

Focusing on India's labor-intensive and export-oriented apparel and textiles industry, we start by extending the Garicano et. al (2016) model of a one-sector economy with size-dependent labor regulations. Based on the Lucas (1978) span of control model with agents as decision-makers, we account for the laws separating the 'informal' and 'formal' sectors of the apparel and textiles industry and theoretically model the effects of export liberalization, conditional on labor law flexibility. [4]

Taking our theory to data from 1998 to 2008 from India's Annual Survey of Industries, we exploit the 2005 abolition of the Multi-Fiber Agreement restricting exports of apparels and textiles from developing to developed countries using a difference-in-differences strategy. Confirming hypotheses from the theoretical framework, we estimate statistically significant increases in average employment and decreases in firm-level average wages for apparel and textile firms in states with flexible labor laws, after accounting for the changes over time attributable to being in the apparel and textiles sector or to being situated in states with flexible labor laws. These results cor-

[3] "Modi Bashes Nehru, but Rejects Only His Good Ideas" The Wall Street Journal. February 23, 2020. https://www.wsj.com/articles/modi-bashes-nehru-but-rejects-only-his-good-ideas-11582483855, accessed on March 7, 2020

[4] These 'informal' and 'formal' firms are also referred to in the literature as 'unregistered' or 'registered' firms, respectively. An 'informal' or 'unregistered' firm is not an 'illegal' or 'black-market' operation in any sense – it is simply below the regulatory threshold for labor laws and still has to adhere to the other laws of the land.

roborate other findings in the literature (Almeida and Poole 2017; Hasan et. al 2007). In addition, we document a rightward shift in the distribution of firm size and wages for the apparel and textiles industry for both flexible and inflexible labor regimes as in Di Giovanni et. al (2011) and find that the shift in the distribution of firm-level wages per employee is greater for firms in states with inflexible labor regulations.

Our results serve as a reminder of the tradeoffs inherent in almost every policy decision and caution against treating any single policy change as a panacea. At the same time, data-driven limitations of our work such as the omission of capital and measures of actual implementation of labor laws motivates interesting areas of future research.

The rest of the paper is organized as follows: Section 2 presents background on India's labor laws, the apparel and textiles industry and the Multi-Fiber Agreement of 1974. Section 3 situates this paper within the literature, and Section 4 describes the theoretical framework. Section 5 describes data and data sources and presents summary statistics. Sections 6 and 7 present the empirical framework and main results, respectively. Section 8 presents robustness checks and Section 9 concludes.

Chapter 2

Background

2.1 India's Labor Laws

Independent India's tradition of extensive worker protections and pro-worker labor regulations derives its roots in the colonial experience of widespread rights suppression and in the socialist outlook that guided India's economic and industrial policy for much of its history. An emphasis on dignity of labor and labor protections is enshrined in India's Constitution – the guiding document for Indian society and state policy. This emphasis is apparent in the fundamental rights and directive principles of state policy as laid out in the document (Planning Commission of India). For instance, while Article 16 of the Constitution guarantees to all citizens the right to form associations or unions, Article 39 directs the state to strive towards achieving equality of pay and a right to livelihood for its citizens.

This emphasis and outlook have manifested themselves in a multiplicity of laws dictating industrial relations, many of which have been documented to have, in some cases, hurt the very workers they sought to protect (Ahsan and Pages 2009). Prominent examples of such laws are the Industrial Disputes Act of 1947, which

limits the ability of firms with more than 100 workers to fire workers or make employment changes and the Factories Act of 1948, that regulates overtime hours and pay (Bhagwati and Panagariya 2013). These labor regulations are often cited as some of the most archaic in the world and are broadly seen as obstacles to economic development – put simply, by making it too expensive to either hire or fire workers, they act as impediments to growth in output and employment (Marjit and Kar 2014). India's laws not only deter existing firms from hiring workers, but also discourage new firms from entering the market – in a survey of global executives, the country's labor regulations were cited as one of the most problematic factors for doing business in the country (World Economic Forum 2017).

As noted earlier, a key feature of an overwhelming majority of India's labor laws is that they are binding only for firms that cross the regulatory threshold of L workers to enter the 'formal' sector ($L = 9$ in most cases). As Amirapu and Gechter (2019) have shown, these size-dependent labor regulations distort the firm-size distribution and disincentivize entrepreneurs from 'putting too many workers under one roof', or, in other words, from entering the formal sector. Thus in a country where most of the workforce is employed in the informal sector, by trying to safeguard the interests of relatively few in the formal sector, these laws have inadvertently prevented many more from accessing those same protections. At the same time, these laws also hurt entrepreneurs by limiting their scale of production.

India's labor regulations are rigid and restrictive, not just in isolation but also when compared with other countries – whether developed or developing. India lags behind the world, not only in terms of GDP per capita but also in terms of the ease of doing business. Table A.1 in the appendix shows a comparison of various features of labor laws across China, the United States, and India. On average, this table

reveals that Indian labor markets are described by (i) a higher ratio of minimum wage to value added per worker, (ii) a shorter probationary period, (iii) a higher premium for overtime, (iv) a higher mandated number of paid leave days and (v) more restrictions on worker dismissals and redundancies.

A key feature of India's labor laws is their status as a "concurrent" subject per the Indian Constitution, meaning that firms are subject to and have to navigate onerous regulations mandated by both the federal and state governments. On the flip side, in the absence of labor reform at the federal-level, this concurrent nature presents an opportunity to spur competitive federalism with states deregulating to attract investment, both domestic and foreign.

2.2 India's Apparel and Textiles Industry

The apparel and textiles industry is the largest employer in India's manufacturing sector, employing an estimated 45 million people and accounting for 32% of total employment in manufacturing (Invest India). It accounts for 12% of India's exports and is an important source of foreign exchange for a country that only a few decades ago experienced a severe balance of payments crisis. Given our focus on understanding how labor regulations mediate the impact of a shock to an industry, the apparel and textiles industry is a good sector to study – its labor-intensive and export-oriented nature means that positive demand shocks like the abolition of the Multi-Fiber Agreement can uncover big variations in labor outcomes, mediated by the regulations that describe those factor markets.

2.3 The Multi-Fiber Agreement (MFA) of 1974

The Multi-Fiber Agreement of 1974 was an internationally-negotiated system of quotas on exports of apparel and textiles from developing countries to developed ones. Per the 1994 Agreement on Textile and Clothing, these quotas were to be phased out over time – with the last phaseout to occur in 2005. These phaseouts were largely delayed until almost all of the restrictions were done away with in one fell swoop on the 31st of December 2004. This phaseout presents a close approximation to a natural experiment, where the bilateral nature of the quota phaseout negotiations helps mitigates the concern of endogeneity.

Chapter 3

Literature Review

This paper is situated within a couple of important threads in the literature. The first is scholarly work studying the relationship between labor market regulations and economic outcomes like output, wages, employment etc. in the Indian context (Holmes 1998; Hasan and Jandoc 2012; Chaurey 2014). Besley and Burgess (2004) was one of the first papers to take the theory to the data in India and, studying cross-state differences in labor law rigidity, the authors broadly found that regulating in a 'pro-worker' direction was associated with slower growth in output, employment and productivity relative to regulating in a 'pro-employer' direction. These negative effects of 'pro-worker' labor regulations on employment in particular were later corroborated by others like Gupta et. al (2009) and Hasan and Jandoc (2012). Another interesting paper in this thread is Adhvaryu et. al (2013) that exploits rainfall fluctuations as exogenous supply or demand shocks to show that labor law flexibility allows for greater increase in employment.

This paper also relates to work like Topalova (2007), Almeida and Poole (2017), Hasan et. al (2007), Topalova and Khandelwal (2011) and Ahluwalia, Hasan, Kapoor and Panagariya (2018) that study the relation between trade and responses of

heterogenous firms or firms operating under heterogenous labor market constraints. An archetypical example is Topalova (2007) that examined the impact of India's sweeping trade liberalization in 1991 to find, among other things, that states with more flexible labor laws were able to better mitigate the effects of trade liberalization on poverty and consumption. In a similar vein, Almeida and Poole (2017) examines Brazil's 1999 currency crisis as an exogenous export shock and finds that firms facing stricter *de facto* labor laws increased employment by less than those which faced more lenient *de facto* labor laws. Another example is Hasan et. al (2007) which found that labor market reforms in India, in the face of trade liberalization, had led to a reduction in labor's share of output, possibly due to a decrease in bargaining power of workers.

This paper contributes to the aforementioned literature in a few ways. First, by studying the phaseout of the Multi-Fiber Agreement we can limit concerns of endogeneity that frequently plague prior work on labor regulations like Besley and Burgess (2004). Second, while most of the work studying exogenous changes in product market regulations in India has focused on the 1991 liberalization, we focus on a recent change. Third, we examine multiple specifications of our variables of interest (employment and wages), including some that are central to the texts of India's labor laws but have been overlooked in the literature. And lastly, this is, atleast in our knowledge, the first work to examine how regulations mediate the effect of export liberalization on the distribution of firm size and wages in India.

The work closest to this is Ahluwalia, Hasan, Kapoor and Panagariya (2018; henceforth AHKP) which also examined the effect of the phaseout of the MFA on wages and employment in India, using a difference-in-differences technique. Though our work is inspired by AHKP and studies the same event, there are some important

differences.

As will become more evident in the frameworks we lay out in this paper, we are interested in studying the *'differential' impact of the MFA phaseout* on apparel and textile firms relative to control, conditional on the labor regulations they face. On the other hand, AHKP focuses on examining the relation between labor regulations and employment/wages and simply uses the MFA phaseout to tease out this relation. Unlike us, they do not measure performance relative to control and simply focus on the difference in changes in outcomes for treated firms, depending on the labor laws they face. While we estimate the effect of the liberalization, accounting for changes over time attributable to being in the apparel and textiles industry or to being in flexible states, AHKP's measure does not separate the change over time attributable to being in flexible states from the change attributable to the liberalization.[1]

Even with the difference in focus, we undertake a more comprehensive study of the event by developing a theoretical framework, examining the distributions and multiple specifications of the variables of interest, addressing more threats to identification and overcoming other shortcomings of AHKP.

It is important to discuss here a few shortcomings and omissions of AHKP and how we address those. First, while AHKP incorporated data through 2010-11 in their analysis, this likely confounds their estimates since India's exports were widely

[1]In our difference-in-differences strategy estimates, we also present marginal post minus pre difference-in-differences. For instance, in our tables "Apparel & Textile – Others, Flexible" is used to refer to the difference between apparel and textile producers in flexible states and our 'others' control group in flexible states. Similarly, "Apparel & Textile – Others, Inflexible" in our tables is used to refer to the difference between apparel and textile producers in inflexible states and our 'others' control group in inflexible states. It is easy to see that while we are interested in "Apparel & Textile – Others, Flexible" minus "Apparel & Textile – Others, Inflexible", AHKP measure "Apparel & Textile, Flexible – Inflexible" or the difference in change in outcomes for flexible and inflexible apparel and textile firms, without considering the change in outcomes for the control

reported to have slumped during and after the Great Recession - this is also apparent in the plot of output for the apparel and textiles industry in Figure 3.1. For this purpose we restrict our analysis to the period before the crisis and analyze data from 1998 to 2008.

Second, while they estimated firm-level outcomes, their specification failed to control for firm-level characteristics or perturbations that can bias results and threaten a causal identification. This paper's empirical framework accounts for that as well by controlling for several firm-level characteristics.

Third, while AHKP defined an employee as a worker directly engaged in production, their definition does not align with that of the Factories Act of 1948, among other laws, which defines the separation between the formal and the informal sector in India, a separation key to our theoretical and empirical framework. We closely follow the Act's definition and define a worker as a person either directly or indirectly engaged in production. This correction is key since most labor laws affecting the formal sector base their definitions of 'workers' and 'establishments' on that used by the Factories Act. The Act itself defines a 'worker' as "a person employed directly or through any agency (including a contractor) with or without the knowledge of the principal employer whether for remuneration or not in any manufacturing process, or in cleaning any part of the machinery or premises used for a manufacturing process, or in any other kind of work incidental to, or connected with the manufacturing process, or the subject of the manufacturing process...". Clearly, our definition is more appropriate.[2] Note that in the rest of the paper, we use the terms worker and

[2]As another example, consider the language of the text of the Industrial Disputes Act of 1947, which defines a 'workman' to be "any person (including an apprentice) employed in any industry to do any manual, unskilled, skilled, technical, operational, clerical or supervisory work for hire or reward, whether the terms of employment be express or implied...". Again, our definition seems more reasonable

employee interchangeably.

Fourth, while AHKP used imputed poverty lines to deflate wages, per their own analysis (and as is evident from our summary statistics) most of the employees at these firms are making wages that are much higher than the poverty line. Thus, their typical consumption basket is better represented by goods in the Consumer Price Index basket than by those used to construct a subsistence-based poverty line. Given our focus on understanding the changes in outcomes for workers, we use CPI data for India from the St. Louis Federal Reserve to deflate nominal wages to 2015 prices to better understand how the changes actually affect workers.

And lastly, while AHKP marked 2004-05 onwards as their post-period, as is clear from Figures 7.1 onwards and is documented in Peerally and Cantwell (2011) among others, there was an uptick in activity across dimensions beginning in the 2003-04 Indian financial year (possibly because of firms preparing for the anticipated phaseout). We thus accordingly adjust our post-period to be 2003-04 onwards.

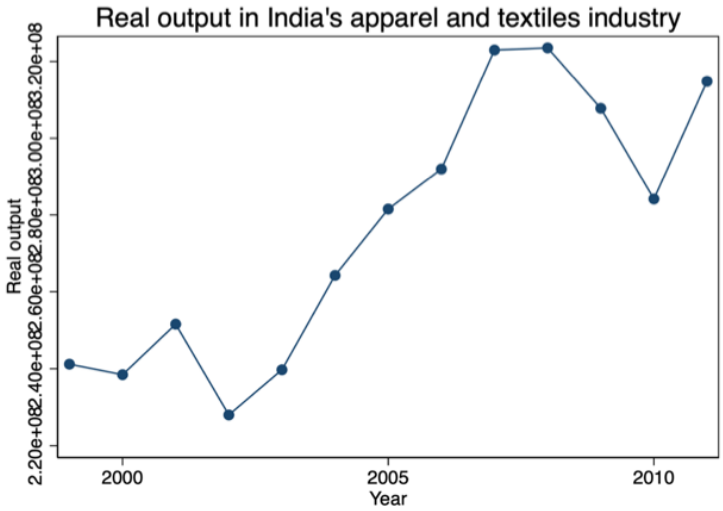


Figure 3.1: Real output in India's apparel and textiles industry

Chapter 4

Theoretical Framework

4.1 Setup

Consider the case of a one-sector economy, where the only outputs are apparel and textiles. Extending Garicano et. al's (2016) model of an economy with size-dependent labor regulations, we focus our attention on the market for labor and take as exogenous a price P in the market for output.[1] We focus on the simple case where the only input is labor (this is perhaps closer to the real world for the labor-intensive apparel and textiles industry, than for other industries). The primitive objects in this model are agents, each of whom has managerial ability or an 'inclination for risk' α, distributed according to a power law PDF $\phi(\alpha)$. To optimize, each agent first chooses between being a worker and being a manager. As a worker, they receive the prevailing wage or as a manager they further optimize and select a level of labor

[1]It is important to note here a few important limitation of the model. First, we simplify to a case of equal access to the export market and this doesn't account for the fact that firms might need to attain scale to export. On the other hand, one could also argue that this simplification allows us to account for the down-stream and up-stream linkages that indirectly affect firms in the same industry. Second, our model does not incorporate cross-sectoral mobility where workers can move between industries. And third, we assume that all workers are paid and all firms pay the same wages. In the real world, even within the same industry, wages depend on the type of employer and the abilities of the worker

to employ and reap the profits of that enterprise.

Here, a firm is comprised of a manager and its labor. In this economy, beyond a threshold of L workers [2], firms face a regulatory burden on labor. This threshold serves as boundary between 'registered' and 'unregistered' firms or 'formal' and 'informal' sector firms, respectively, in the Indian context.

Garicano et. al (2016) model the cost of bearing the burden of labor regulations by a payroll tax (τ) and a fixed-cost F of dealing with regulations. For instance, $\tau = 1.03$ would represent a 3-percent payroll tax. A state with more rigid labor laws would be modeled with a higher tau and F.[3] Let l represent the number of workers a firm chooses to employ, f represent a universal production function with diminishing marginal returns such that $f' > 0$ and $f'' < 0$ and w represent the wage paid to a worker.[4] For a manager with ability α and labor l, output is given by $\alpha f(l)$. A firm (or manager) chooses a profit-maximizing number of workers, l, such that:

if $l \leq L$,

$$\pi(\alpha) = \max_{l}(P\alpha f(l) - wl)$$

or, if $l > L$

$$\pi(\alpha) = \max_{l}(P\alpha f(l) - w\tau l - F)$$

if $l \leq L$, the profit-maximizing first-order condition is given by

[2] $L = 9$ in most cases in India

[3] To simplify things, we assume F is constant across different labor regulation regimes and differences in labor regulation flexibility manifest in differences in tau

[4] Another important limitation of our simple model is the assumption of a common wage for the informal and formal sectors, which likely doesn't hold true in practice.

$$P\alpha f'(l^*) - w = 0$$

if $l > L$, the profit-maximizing first-order condition is given by

$$P\alpha f'(l^*) - \tau w = 0$$

These can be collapsed into one:

$$P\alpha f'(l^*) - \bar{\tau} w = 0,$$

with $\bar{\tau} = 1$ for $l \leq L$, and $\bar{\tau} = \tau$ for $l > L$.

From this, we can back out

$$l^*(P, \alpha, \tau, w) = f'^{-1}(\frac{\bar{\tau} w}{P\alpha})$$

Given the nature of the production function f, the firm-size is clearly increasing in α and P, and decreasing in $\bar{\tau}$ and w, as one would expect.

At the threshold L, a 'constrained' manager (one who would have produced at the regulatory threshold even without the regulation) has an α denoted by α_c such that

$$\alpha_c = \frac{w}{Pf'(L)} \tag{4.1}$$

Now, consider the other threshold α_r, beyond which a manager would prefer to bear the burden of labor regulations. At α_r, this manager is indifferent between hiring exactly L workers and going over the threshold and paying the associated costs.

$$P\alpha_r f(L) - wL = P\alpha_r f(l(\alpha_r)) - w\tau l(\alpha_r) - F \tag{4.2}$$

Here, $l(\alpha)$ is the simplified notation for $l(P, \alpha, \tau, w)$

In equilibrium in this labor market, three conditions must hold:

1. Given the equilibrium wage w^* and the environment variables like P, τ, F, no worker wants to become a manager and vice-versa.
2. All managers optimize their choice of labor given the environment variables.
3. The market for labor clears at the prevailing wage.

From the first condition, let α_m reflect the indifference point or the level just above which an agent would prefer to be a manager over being a worker. Then,

$$P\alpha_m f(l(\alpha_m)) - w^* l(\alpha_m) = w^* \tag{4.3}$$

from the second condition, optimal labor demand l^* is given by:

$$l^*(\alpha) = \begin{cases} 0 & \text{if } \alpha < \alpha_m \\ f'^{-1}(\frac{w^*}{P\alpha}) & \text{if } \alpha_m \leq \alpha \leq \alpha_c \\ L & \text{if } \alpha_c \leq \alpha < \alpha_r \\ f'^{-1}(\frac{\tau w^*}{P\alpha}) & \text{if } \alpha \geq \alpha_r \end{cases}$$

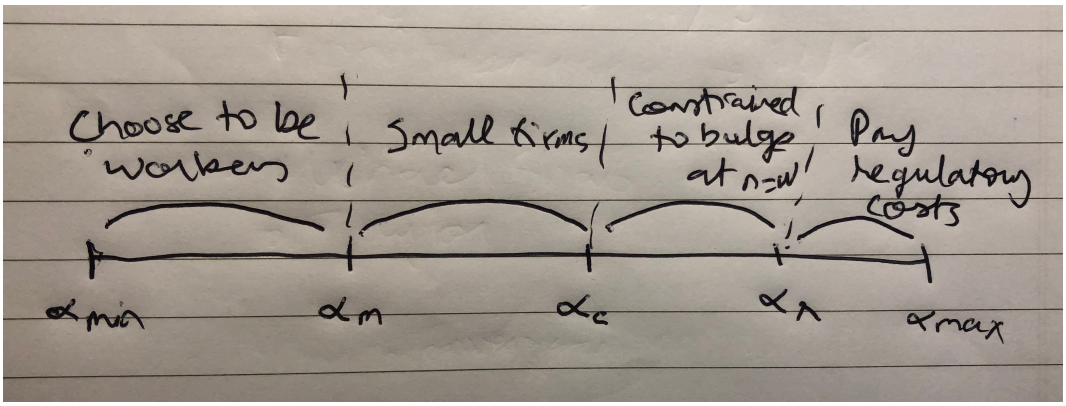
and from the third:

$$\int_{\alpha_{min}}^{\alpha_m} \phi(\alpha) d\alpha = \int_{\alpha_m}^{\alpha_{max}} l^*(\alpha)\phi(\alpha) d\alpha \tag{4.4}$$

where α_{min} and α_{max} are the lower and upper bounds of the domain of $\phi(\alpha)$. We have four unknowns – the three thresholds of managerial ability α_m, α_c and α_r and

the equilibrium wage w^* – and four equations (4.1), (4.2), (4.3) and (4.4). Thus we can solve for equilibrium in this market.

In essence, our model segments agents in the economy into four parts - (i) workers, (ii) small firms that would have hired between 1 and L workers even in the absence of regulations, (iii) firms that would have hired more than L workers without regulations, but are now constrained to maximize at L, (iv) firms that still choose to hire more than L workers and pay the regulatory costs τ and F. Clearly, firms in categories (ii) and (iii) make up the 'informal' sector and firms in category (iv) make up the 'formal' sector in the Indian context.



4.2 Comparative Statics

We now turn to comparative statics to understand how a positive demand shock in the form of the MFA phaseout will affect our variables of interest, conditional on labor regulations. Modelling the positive demand shock as an increase in price P, we're interested in evaluating how labor regulations (modeled as the payroll tax τ) mediate the impact of the demand shock on two key variables of interest.

1. Employment for a firm in the formal sector (l where $\alpha \geq \alpha_r$)[5]

2. Equilibrium wage (w)

For each of the aforementioned variables γ, we are interested in determining the sign of $\frac{d\gamma}{dP}$ and $\frac{d}{d\tau}(\frac{d\gamma}{dP})$.

4.2.1 Employment for a firm in the formal sector

Lets first look at how labor regulations (modeled as the payroll tax τ) mediate the impact of the demand shock on employment.

As in earlier, a manager such that $\alpha \geq \alpha_r$ faces a profit function given by:

$$\pi(\alpha) = P\alpha f(l) - w\tau l - F$$

At the profit-maximizing value of l

$$P\alpha f'(l) = w\tau$$

Differentiating w.r.t. P,

$$P\alpha f''(l)\frac{dl}{dP} + \alpha f'(l) = 0$$

if $\alpha \neq 0$

$$\frac{dl}{dP} = \frac{-f'(l)}{Pf''(l)}$$

,

[5]Given the availability of reliable data for India only for formal firms in India, we focus our attention on that part of the economy

As a sanity check, this ratio is positive as expected because $f'(l) > 0$, $f''(l) < 0$ and $P > 0$. As the price of output in the product market increases, a manager hires more labor. Thus, a positive demand shock in the form of the MFA phaseout should drive a formal sector firm to hire more.

Now, to understand how this response is mediated by different levels of labor regulation flexibility, we focus on $\frac{d}{d\tau}(\frac{dl}{dP})$. Differentiating w.r.t τ, we get

$$\frac{d}{d\tau}(\frac{dl}{dP}) = \frac{Pf''(l)(-f''(l)\frac{dl}{d\tau}) + f'(l)Pf'''(l)\frac{dl}{d\tau}}{P^2 f''(L)^2}$$

As the denominator is positive, consider the numerator:

$$Pf''(l)(-f''(l)\frac{dl}{d\tau}) + f'(l)Pf'''(l)\frac{dl}{d\tau}$$

$$= P\frac{dl}{d\tau}(f'(l)f'''(l) - (f''(l))^2) \tag{4.5}$$

For a Cobb-Douglas production function, $f(l) = l^\theta$ where $0 < \theta < 1$,

$$f'(l) = \theta l^{\theta-1}$$

$$f''(l) = \theta(\theta-1)l^{\theta-2}$$

$$f'''(l) = \theta(\theta-1)(\theta-2)l^{\theta-3}$$

Plugging these values into (4.5) we get,

$$P\frac{dl}{d\tau}(\theta l^{\theta-1}\theta(\theta-1)(\theta-2)l^{\theta-3} - (\theta(\theta-1)l^{\theta-2})^2)$$

$$= P\frac{dl}{d\tau}(\theta^2(\theta-1)(\theta-2)l^{2\theta-4} - (\theta^2(\theta-1)^2 l^{2\theta-4}))$$

$$= P\frac{dl}{d\tau}\theta^2(\theta-1)l^{2\theta-4}((\theta-2)-(\theta-1))$$

$$= P\frac{dl}{d\tau}\theta^2(\theta-1)l^{2\theta-4}\times(-1)$$

We know that $P > 0$, $\frac{dl}{d\tau} < 0$[6] , $\theta^2 > 0$, $(\theta-1) < 0$ and $l^{2\theta-4} > 0$

$$\frac{d}{d\tau}(\frac{dl}{dP}) < 0$$

Thus, states with a higher regulatory burden on labor will exhibit smaller cross-price elasticities of demand for labor.

4.2.2 Equilibrium wage

In the absence of a simple closed form solution for w in terms of P or τ, we analyze this comparative static logically. If w remains constant and P goes up, we would expect the threshold α_r to go down since the returns to entering the formal sector have gone up. Similarly, we would expect α_c to go down since more 'small' firms will optimize at $l = L$. And we would also expect α_m to go down since the opportunity cost of being a worker instead of a small manager has increased. In such a situation, the supply of labor has clearly gone down while the demand has gone up. It is apparent that for this market to clear and reach equilibrium, w has to go up. Thus, $\frac{dw}{dP} > 0$. Therefore, we would expect firms in the apparel and textiles industry to experience an increase in wages relative to control firms after the MFA phaseout. In the absence of an obvious effect of τ on this quotient in equilibrium, the sign of $\frac{d}{d\tau}(\frac{dw}{dP})$ is to be determined and we estimate it empirically in Chapter 7.

[6] τ represents an additional tax on labor

We also note here that in future work, one could also obtain a PDF for the firm size distribution and model the theoretical impact of a demand shock.

Chapter 5

Data and Summary Statistics

For the purposes of this paper, we utilize data from four main sources:

1. Plant-level data from 1998-99 to 2007-08 from the Annual Survey of Industries (ASI), conducted by India's Ministry of Statistics and Programme Implementation (MOSPI)

2. National Industry Classification (NIC-1998, NIC-2004 and NIC-2008), from MOSPI

3. Consumer Price Index data from the St. Louis Federal Reserve

4. A state-level index of labor regulation flexibility, prepared by AHKP (2018)

The Annual Survey of Industries (ASI) is a nationally representative survey conducted by India's Ministry of Statistics and Programme Implementation that covers 'registered' or 'formal' sector manufacturing establishments that employ 10 or more workers with power or 20 or more workers if the firm does not use power. The ASI is a rich dataset that contains firm-level information on employment, industry classification, expenses, inputs, energy usage, outputs etc., some of which we use in our analyses. It has been called the principal source of industrial statistics in India

and has been used extensively in the literature on Indian labor and labor markets, in works such as Hsieh and Olken (2014), Chaurey (2014), Adhvaryu et. al (2013), Ahsan and Pages (2009) among others. After cleaning the data for missing values on employment, wages etc. we are left with 131, 726 observations.

Table 5.1 presents probability-weighted summary statistics pre- and post- the MFA phaseout, for different labor regulation regimes. We deflate nominal variables to 2015 prices. Note that a worker-day is a unit of labor where one worker-day is equal to one worker working for one day and 'others' refers to other labor-intensive industries that we use as our control in the empirical framework.

For both the apparel and textiles industry and the other labor-intensive industries under consideration, wages in both periods in flexible states are lower than or just at par with those in inflexible states, irrespective of whether wages are measured per year or per worker-day. Further, for the apparel and textiles industry, the mean number of employees per firm is higher in flexible as compared to inflexible states in the post-MFA period, reversing a pre-period trend. Additionally, average labor productivity is lower for apparel and textile firms in flexible states than those in inflexible states for both periods, whether per year or per worker-day – perhaps because of inflexible firms adjusting to capital-intensive production methods to limit the influence of labor regulations. The table also reveals that the overall increase in mean employees per firm for the apparel and textiles industry is in opposition to an almost stagnant number of mean employees per firm for other labor-intensive industries. In both industries, the mean number of employees seems to have grown faster for flexible states versus for inflexible states. Though firms in both types of labor market regimes see wage growth for both industries, wages

Table 5.1: Summary statistics by state type (flexible versus inflexible labor regulations)

	Pre-MFA Phaseout			Post-MFA Phaseout		
	Overall	**Flexible**	**Inflexible**	**Overall**	**Flexible**	**Inflexible**
Mean employees per firm, Apparel & Textiles	105.5	99.6	115.2	122.1	123.5	119.5
Mean employees per firm, Others	65.1	62.2	69.7	64.2	63.3	65.5
Mean real wages per employee per year, Apparel & Textiles (per firm, in rupees)	89,815	79,937	105,867	116,152	107,271	131,211
Mean real wages per employee per year, Others (per firm, in rupees)	68,154	64,763	73,447	90,815	90,146	91,808
Mean real wages per worker-day, Apparel & Textiles (per firm, in rupees)	304	267	363	388	359	437
Mean real wages per worker-day, Others (per firm, in rupees)	258	239	287	337	338	334
Average real output per employee per year, Apparel & Textiles (per firm, in rupees)	2,374,180	2,297,952	2,493,358	2,609,074	2,378,913	2,970,242
Average real output per employee per year, Others (per firm, in rupees)	2,995,494	3,081,827	2,876,777	4,179,460	4,389,911	3,881,736
Average real output per worker-day, Apparel & Textiles (per firm, in rupees)	8004	7644	8568	8597	7790	9865
Average real output per worker-day, Others (per firm, in rupees)	11178	11380	10900	15132	16285	13503

Note: 'Others' includes manufacture of food, leather, tobacco, wood products and paper products. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. Nominal values are deflated to 2015 prices using a CPI deflator and summary statistics use probability weights.

seem to have grown faster for firms in flexible states than for those in inflexible states.

Similar to AHKP, we study the formal sector covered by the ASI data for two main reasons. The first is that most informal sector firms employ fewer than 10 workers, are engaged in very small-scale production and are thus likely unable to fulfill international orders. Thus the demand shock we examine will be experienced primarily by formal sector firms. The second is that the impact of cross-state differences in labor regulation flexibility will be most salient for formal sector firms, to whom such regulations primarily apply. Nonetheless, it is important to add the caveat that our analysis does not capture the effects of the MFA on downstream or upstream informal sector firms. While there are two principal datasets that cover the informal sector in India – the National Sample Survey Organization's Survey on Unorganized Manufacturing Enterprises (NSS-SUME) and the Economic Census (EC) – their quinquennial nature would limit the robustness of a study of the impact of the MFA phaseout.[1] Additionally, the absence of data on wages and other key variables would also preclude several of our analyses.

It is important to note here a couple of limitations of the ASI dataset. First, as mentioned, the lack of data on the informal sector means that our results exclude a part of the apparel and textiles industry that accounts for almost 80% of employment (Hasan et. al 2017). And second, the lack of repeated observations and firm-level identifiers means that we are unable to include firm-fixed effects that could have helped control for unobservables and added to the credibility of the identification strategy.

[1]Over the past three decades, the most recent Economic Censuses were conducted in 1990, 1998, 2005 and 2013 while the Surveys on Unorganized Manufacturing Enterprises were conducted in 1994-95, 1998-99, 2000-01, 2005-06 and 2010-11.

We use India's National Industry Classification from 1998, 2004 and 2008 to create a concordance table across different years and deflate wages to 2015 prices using CPI data from the St. Louis Federal Reserve. Along the lines of Aghion et. al (2005), we restrict our analysis to the 15 major states that account for more than 92% of India's apparel and textiles industry activity.

And finally, we use AHKP's index classifying states according to labor regulation flexibility. This classification incorporates information and indices from four seminal papers studying cross-state differences in labor regulations in India. It incorporates, among other things, (i) data on state-level amendments to labor laws from Besley and Burgess (2004), (ii) scores on contract labor regulations from Dougherty (2009), (iii) information on laws constraining inspectors from OECD (2007) and (iv) composite scores from Gupta, Hasan and Kumar (2008) (henceforth GHK), which itself aggregated information from three different indices. Table 5.2 presents the state-level classification where states are classified as 'Flexible', 'Inflexible' or 'Neutral' according to labor regulation flexibility/rigidity. Going forward, we use terms like 'flexible state' to refer to a state with 'flexible' labor regulations. As in GHK, we subsume states classified as 'Neutral' into the 'Inflexible' given the baseline rigidity of India's labor laws as compared to those of other countries.[2] As documented in Manna (2008), since most of the firms in the ASI data are single-plant operations, we use the terms 'firm' and 'plant' interchangeablym in this paper.

Our use of this index necessitates noting two key limitations. The first is that the time-invariant classification of states does not account for year-to-year changes in labor law flexibility within a state. And second, our estimates here are based on *de jure* and not *de facto* regulations. As work such as Almeida and Poole (2017) and

[2]In the section on robustness checks, we repeat our primary analyses by excluding 'neutral' states from the sample

Amirapu and Gechter (2019) shows, especially in developing countries, factors such as corruption, restrictions on labor inspectors or limited state capacity can mean that *de facto* regulations better represent the *actual* regulatory burden that an entrepreneur faces, even with the same level of *de jure* labor regulation flexibility. For instance, studying the impact of currency chocks on employment in Brazil, Almeida and Poole (2017) used data on labor inspectors' visits to plants as a measure of the *de facto* regulatory burden faced by firms. They found that even with the same flexibility of *de jure* regulations, enforcement of those regulations mediate the impact of the trade shock. While our index incorporates information from OECD (2007) documenting constraints placed on inspectors, the lack of reliable, consistent data on enforcement or *de facto* regulations precludes their thorough study in our work.

Table 5.2: State-level index of labor regulation flexibility/rigidity

State	**Categorization (AHKP)**
Andhra Pradesh	Flexible
Assam	Neutral
Bihar	Neutral
Gujarat	Flexible
Haryana	Neutral
Karnataka	Flexible
Kerala	Inflexible
Madhya Pradesh	Flexible
Maharashtra	Inflexible
Orissa	Inflexible
Punjab	Neutral
Rajasthan	Neutral
Tamil Nadu	Flexible
Uttar Pradesh	Flexible
West Bengal	Inflexible

Note: This index covers the 15 major manufacturing states of India, which account for more than 92% of firms in India's apparel and textiles industry. Source: Ahluwalia, Hasan, Kapoor and Panagariya (2018)

Chapter 6

Empirical Framework

We now develop an empirical framework to take to the data and complement our discussion of the theoretical underpinnings from Chapter 4. We are interested in estimating how labor regulations mediate the impact of the phaseout of the MFA on firms in the apparel and textiles industry. To isolate the effect of the treatment (MFA phaseout), we want to construct a counterfactual to understand what would have happened in the absence of this 'natural experiment'. We use a difference-in-differences estimation as our main identification strategy to isolate this effect and use labor-intensive, export-oriented industries covering the manufacture of food, leather, tobacco, wood products and paper products as our comparison group.[1] Important to our strategy here is the parallel trends assumption that before the MFA phaseout, both the treatment and control groups followed a similar pre-period trajectory for the variables of interest.

By subtracting the post-pre change for control from the post-pre change for treatment, we net out factors that were common to both groups and assume that we are left with the measured impact of the treatment. For instance, it is possible that firms in both apparel and textiles and other labor-intensive industries benefited

[1]These industries are referred to as 'Others' in the tables to follow.

from a country-wide economic boom. A simple post minus pre estimate for apparel textile firms would erroneously assign to the MFA phaseout effects that were driven by broader economy prosperity. Assuming that such factors affect both groups in a similar manner, the difference-in-differences strategy allows us to net those effects out.

We analyze outcomes along three dimensions – (i) whether a firm was observed pre- or post-trade liberalization (ii) whether the firm's industry was affected by the change (using other labor-intensive industries as our comparison group) and, (iii) what type of labor regulations the firm operated under. The triple difference allows us to measure how labor regulations mediated how the responses of treatment relative to those of control. We are interested in the estimated coefficient on the triple interaction term to measure the impact of the export liberalization on the difference between apparel and textile firms and the comparison group in flexible states relative to that difference in inflexible states. In other words, the triple interaction term allows us to understand what the 'differential' impact of the MFA phaseout was on treated firms relative to control in states with flexible labor laws, when compared with the impact on treated firms relative to control in states with inflexible labor laws. Yet still, we estimate the effect of the liberalization, after controlling for the changes over time that are attributable to being in the apparel and textiles industry or to being in flexible states. Our identifying assumption is that there weren't any factors that selectively affected only apparel and textiles firms located in flexible states.

We also note here that in the absence of a perfect control group, a triple difference strategy can help reduce bias over a simple difference-in-differences strategy (Berck and Villas-Boas 2015). Consider a scenario in which labor-intensive industries were changing differently in states with more or less stringent labor regulations at the

same time as the MFA liberalization took place. In such a case, a simple difference-in-differences strategy would erroneously attribute to the MFA liberalization an effect that was in fact unique to states with particular labor regulation regimes. The triple difference helps alleviate this concern.

Since the phase outs were common knowledge, one could expect some changes in anticipation before the actual phase out, and as documented by Peerally and Cantwell (2011), firms seem to have begun preparing more than a year in advance of the quota phaseout. This is to be expected since firms would want to ramp up capacity or output to take advantage of the phaseouts as soon as they happened. Again, this is also apparent from Figure 7.1 onwards, where there is an uptick in activity across dimensions starting the 2003-04 financial year. Therefore, as mentioned earlier, we divide the period of analysis into pre- and post-MFA phaseout periods covering 1998-2003 and 2003-2008 respectively.

6.1 Labor regulations and the MFA phaseout's effect on employment and wages

Here, using data from 1998-99 to 2007-08 from the Annual Survey of Industries, our specification is:

$$y_{fst} = \alpha + \beta_1(apptextiles_f \times postMFA_t) + \beta_2(flexible_s \times postMFA_t) + \beta_3(apptextiles_f \times flexible_s \times postMFA_t) + apptextiles_f + apptextiles_f \times flexible_s + age_f + age_f^2 + i.type - of - ownership_f + rural_f + self - generated - electricity - to - total_{st} + year_t + state_s + \epsilon_{st}$$

Here, y_{fst} is a measure of employment or wages and f indexes the firm, s indexes the state and t indexes the year. $apptextiles_f$ is a binary indicator for whether the firm was classified according to the National Industrial Classification as being in the apparel or textiles industry, $flexible_s$ is a binary indicator for whether the firm was located in a state with labor regulations classified as flexible and $postMFA_t$ is an indicator for the post-period. β_1, β_2 and β_3 are our coefficients of interest, where β_3 is the coefficient on the triple difference. Each plant-level observation is probability-weighted.

$year_t$ and $state_s$ represent year-fixed and state-fixed effects respectively. Following Shukla et. al (2004), we include $self - generated - electricity - to - total_{st}$ as a control at the state-year level for the ratio of energy produced by firms themselves to their total energy needs, as a proxy for infrastructure quality. This is based on the notion that plants that need to generate their own electricity reflect the need for back-up power arrangements, and thus signal low infrastructure quality. $i.type-of-ownership_f$ is a control for type of ownership – whether privately-owned, publicly-owned or jointly-owned – since publicly owned firms in the sample are much larger on average. For a similar reason, we include $rural_f$ as an indicator to control for whether a firm was rural or urban since there are well-documented differences in productivity across the two settings (Hnatkovska and Lahiri 2013). We also include the firm's age as a quadratic term $agef$ and age_f^2, drawing from Topalova and Khandelwal (2011), to account for a firm's differential ability to respond to a demand shock based on its age. To account for serial correlation, all reported standard errors are clustered at the state and two-digit industry level.

Borrowing from AHKP, following most of our estimates of regression coefficients, we also present marginal post minus pre difference-in-differences. For instance, in our

tables "Apparel & Textile – Others, Flexible" is used to refer to the difference between apparel and textile producers in flexible states and our 'others' control group in flexible states. This can be obtained by summing β_1 and β_3. Similarly, "Apparel & Textile – Others, Inflexible" in our tables is used to refer to the difference between apparel and textile producers in inflexible states and our 'others' control group in inflexible states and is given by β_1. It is easy to see that β_3 represents the aforementioned 'differential' impact of the MFA phaseout on treated firms relative to control in states with flexible labor laws, as compared with treated firms relative to control in states with inflexible labor laws.

6.2 Labor regulations and the MFA phaseout's effect on the distribution of employment/firm size and wages

This specification is identical to that in Section 6.1 but instead employs quantile regressions to compute the expected quantiles of employment or wages for firm 'i' in state 's' for year 't'. We estimate values for the 25th, 50th, 75th and 99th percentiles.

$$y_{fst} = \alpha + \beta_1(apptextiles_f \times postMFA_t) + \beta_2(flexible_s \times postMFA_t) + \beta_3(apptextiles_f \times flexible_s \times postMFA_t) + apptextiles_f + apptextiles_f \times flexible_s + age_f + age_f^2 + i.type - of - ownership_f + rural_f + self - generated - electricity - to - total_{st} + year_t + state_s + \epsilon_{st}$$

Again, β_1, β_2 and β_3 are our coefficients of interest, where β_3 is the coefficient on the triple difference.

Unlike the average treatment effect, one should not infer causation for estimates for this section since estimating Quantile Treatment Effect on the Treated (QTET) involves stronger assumptions and conditions that differ from those required for the Average Treatment Effect on the Treated (ATT) (Callaway and Li 2019). We leave those identifying assumptions and conditions for future work.

Chapter 7

Main Results

7.1 Labor regulations and the MFA phaseout's effect on employment and wages

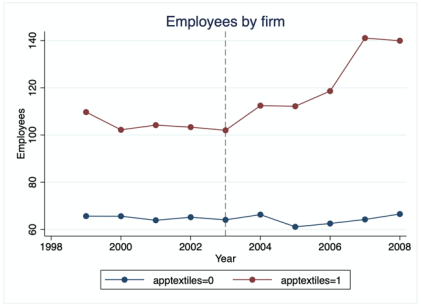
7.1.1 Employment

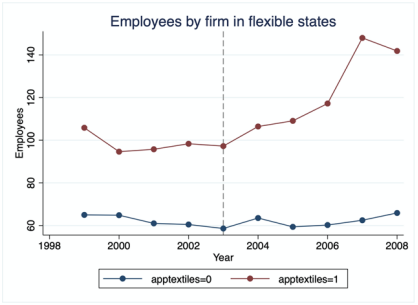
As measures of employment, we examine (i) number of employees/workers by firm and (ii) number of worker-days per firm per year (where one worker-day is equal to one worker working for one day) as our outcome variables. We also include the logarithms of the aforementioned variables to study relative changes and address concerns about overdispersion. In addition to including the number of employees as a measure of employment or firm size, we also include worker-days as an outcome variable of interest since it is used as a size threshold for some clauses in important laws like the Industrial Disputes Act of 1947. This is an oft omitted variable in recent work like Amirapu and Gechter (2019) and AHKP. Since our difference-in-differences strategy relies on the parallel trends assumption, we verify it first by visually examining pre-period trends for the different measures of employment in consideration (Figures 7.1 through 7.4). We later also test empirically for pre-period trends in the

chapter on robustness checks.

For each measure, the figures present timeplots for (i) treatment and comparison groups across all states, (ii) treatment and comparison groups in states with flexible labor regulations and (iii) treatment and comparison groups in states with inflexible labor regulations. Clearly, from Figures 7.1 and 7.3, we can see that the treatment and comparison groups exhibit roughly parallel trends in the pre-period for (i) number of employees by firm and (ii) number of worker-days by firm. From 7.2 and 7.4, there seems to be some noise in the plots for (i) log of number of employees by firm and (ii) log of number of worker-days by firm. This can be expected since the logarithmic transformation by reducing the influence of larger firms, puts more 'weight' on smaller and more 'noisy' firms. Here, we should only draw correlational inferences for those two variables.

Figure 7.1: Timeplot of employees by firm for treatment and comparison groups, (i) across all states, (ii) in states with flexible labor laws, (iii) in states with inflexible labor laws





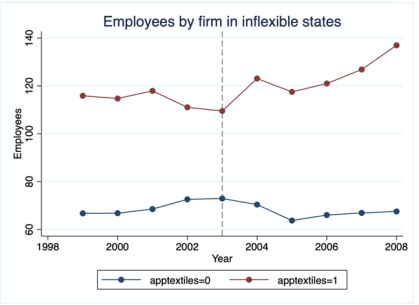
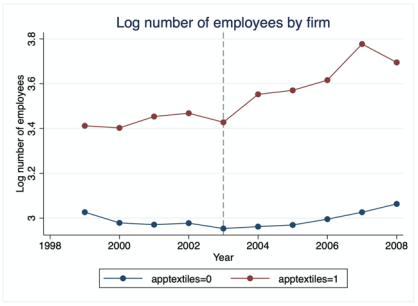
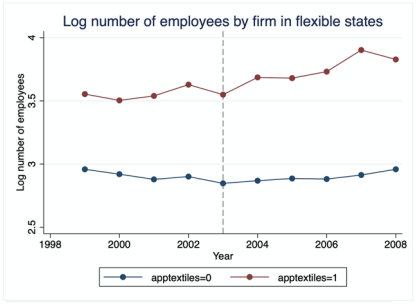


Figure 7.2: Timeplot of log employees by firm for treatment and comparison groups, (i) across all states, (ii) in states with flexible labor laws, (iii) in states with inflexible labor laws





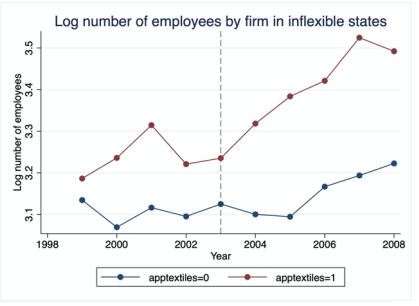
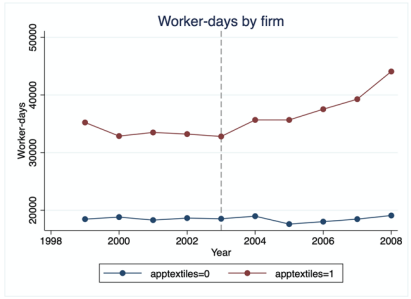
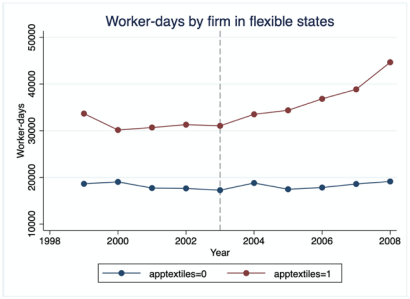


Figure 7.3: Timeplot of worker-days by firm for treatment and comparison groups, (i) across all states, (ii) in states with flexible labor laws, (iii) in states with inflexible labor laws





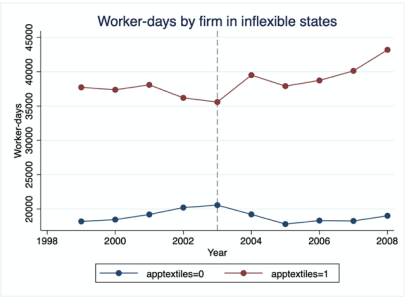
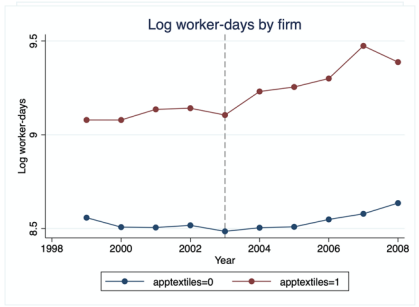
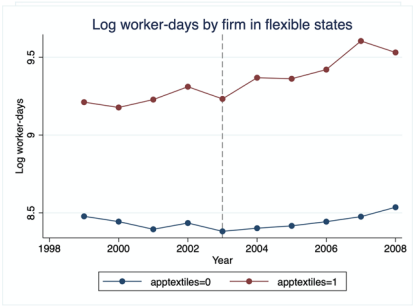
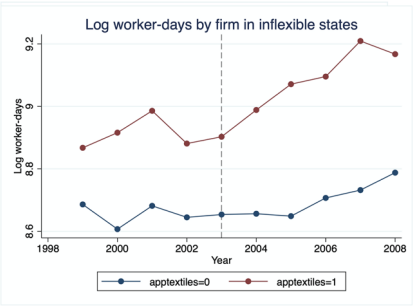


Figure 7.4: Timeplot of log worker-days by firm for treatment and comparison groups, (i) across all states, (ii) in states with flexible labor laws, (iii) in states with inflexible labor laws







Tables 7.1 and 7.2 present regression analogues of the figures above. The four columns address our four outcome variables:

1. Number of employees by firm
2. Log of number of employees by firm
3. Number of worker-days by firm
4. Log of number of worker-days by firm

Table 7.1 describes the coefficient estimates for the model laid out in our empirical framework. Of key interest here are the coefficients on the triple difference or *Apparel & Textiles * Flexible * post-MFA*. Again, these coefficients measure the impact of the export liberalization on apparel and textile firms in flexible states, accounting for changes over time attributable to being in the apparel and textiles industry to to being in flexible states.

Table 7.2 presents difference-in-differences estimates (i) between apparel and textile firms in flexible states and apparel and textile firms in inflexible states, (ii) between other firms in flexible states and other firms in inflexible states, (iii) between apparel and textile firms in flexible states and other firms in flexible states, and (iv) between apparel and textile firms in inflexible states and other firms in inflexible states.

From the third row of Table 7.2, we see statistically significant increases in employment for apparel and textile firms relative to comparison firms in flexible states across almost all the different measures. Relative to other labor-intensive firms, there is an increase of almost 30 workers for apparel and textile firms in flexible states, and

this increase is statistically significant at the 10% significance level. This also corresponds to increases of 19.3 and 17.5 percent in the number of workers and number of worker-days, respectively, for apparel and textile firms in flexible states relative to the comparison group in flexible states. Both these differences are statistically significant at the 1% significance level. The absolute increase in worker-days is statistically insignificant. From the fourth row, we see similar increases across the board in inflexible states but these are smaller in magnitude and statistically insignificant. These documented increases align with the theory from chapter 4 where we saw that $\frac{dl}{dP} > 0$.

From the second row of Table 7.2, we also see that these increases are muted and statistically insignificant for other labor-intensive firms in flexible states relative to those in inflexible states.

Reading off the triple interaction from the third row of Table 7.1, we see that net of the change over time that is attributable to being in apparel and textiles, and of the change over time that is attributable to being in flexible states, firms that are in flexible states in the apparel and textiles industry see an almost 18 person increase in employment driven by the MFA liberalization. This increase is statistically significant at the 5% significance level. While there are similar increases for other measures of employment as measured by the other triple interactions, those are statistically insignificant. These results seem to suggest that treatment firms in flexible states were better able to take advantage of the demand shock and hire more workers because of the flexibility of their states' labor laws. These results also broadly agree with expectations from our theoretical framework from Chapter 4, where we saw that $\frac{d}{d\tau}(\frac{dl}{dP}) < 0$ or that states with a lower regulatory burden on labor would exhibit greater cross-price elasticities of demand for labor. Our results here also corroborate findings of Almeida and Poole (2017) who documented greater in-

creases in employment in Brazil after a positive demand shock, relative to control, for plants facing flexible labor laws as compared to those facing more inflexible labor laws.

Now, from the summary statistics in Table 5.1 we saw that on average apparel and textile firms in inflexible states in the pre-period were above or close to the regulatory threshold of 100 workers which comes with suite of regulations like Section VB of the Industrial Disputes Act etc. Based on this, some might argue that the average apparel and textile firm in such states faced a much larger marginal cost of increasing employment than it generally would have and this disproportionately constrained their ability to expand. However, as Amirapu and Gechter (2019) have shown, *de jure* regulations that bound at this threshold close to 100 don't seem to have an impact on the firm size distribution as measured by data. Another possible explanation could be that regardless of the binding constraint on inflexible firms near the regulatory threshold, apparel and textile firms in flexible states had more room to hire workers since they were smaller in the pre-period than those in inflexible states.

Table 7.1: Regressing measures of employment on indicators for MFA abolition, industry classification, labor law flexibility and their interactions

	(1)	(2)	(3)	(4)
Coefficient of Interest	Employees (total by firm)	Log employees (total by firm)	Worker-days (total by firm)	Log worker-days (total by firm)
Apparel & Textiles * post-MFA	12.15	0.149	3026.43	0.151
	(14.26)	(0.088)	(4144.26)	(0.091)
Flexible * post-MFA	-1.15	-0.048	-551.95	-0.025
	(5.41)	(0.050)	(1336.46)	(0.048)
Apparel & Textiles * Flexible * post-MFA	17.82**	0.043	3707.42	0.024
	(8.75)	(0.081)	(2531.71)	(0.087)
Constant	56.21***	3.007***	15570.23***	8.548***
	(9.61)	(0.089)	(2982.38)	(0.081)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	131,726	130,097	131,726	129,982
Adjusted R^2	0.0087	0.0963	0.0109	0.1063

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table 7.2: Estimates of differences-in-differences for measures of employment

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Employees (total by firm)	Log employees (total by firm)	Worker-days (total by firm)	Log worker-days (total by firm)
Apparel & Textile, Flexible – Inflexible	16.67**	-.005	3155.47*	-.001
	(5.50)	(.074)	(1724.52)	(.072)
Others, Flexible – Inflexible	-1.15	-.048	-551.95	-.025
	(5.41)	(.050)	(1336.46)	(.048)
Apparel & Textile – Others, Flexible	29.97*	.193***	6733.85	.175***
	(14.14)	(.038)	(4527.27)	(.026)
Apparel & Textile – Others, Inflexible	12.15	.149	3026.43	.151
	(14.26)	(.088)	(4144.26)	(.091)

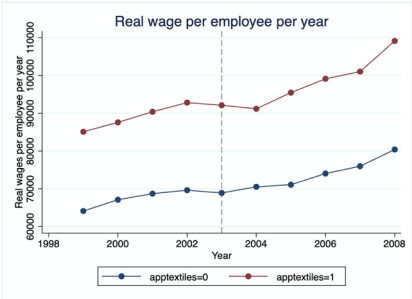
Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01. Each row presents difference-in-differences estimates (i) between apparel and textile manufacturers in flexible states and apparel and textile manufacturers in inflexible states, (ii) between other manufacturers in flexible states and other manufacturers in inflexible states, (iii) between apparel and textile manufacturers in flexible states and other manufacturers in flexible states, and (iv) between apparel and textile manufacturers in inflexible states and other manufacturers in inflexible states.

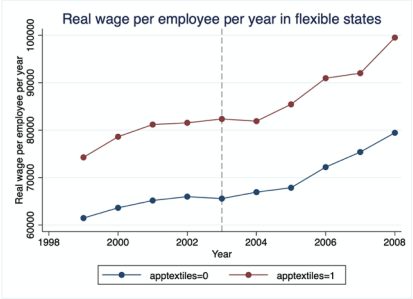
7.1.2 Wages

Now, as measures of wages, we consider (i) real wages per employee per year (mean by firm, in rupees) and (ii) real wages per employee per day worked (mean by firm, in rupees) along with their log values . As discussed in the previous section, we examine wages not just at the annual level but also at the worker-day level given the centrality of the notion of worker-day to India's labor laws. Additionally, just as in other Indian industries, workers in the apparel and textile industry are often paid daily wages and not monthly or annual salaries.

Again, we verify the parallel trends assumption by visually examining pre-period trends for the different measures of wages in consideration in Figures 7.5 through 7.8. As with our discussion of employment, we later also test this assumption empirically in the chapter on robustness checks. From the figures, we can see that the treatment and comparison groups exhibit similar trajectories in the pre-period for all the outcome variables under consideration.

Figure 7.5: Timeplot of real wages per employee per year for treatment and comparison groups, (i) across all states, (ii) in states with flexible labor laws, (iii) in states with inflexible labor laws





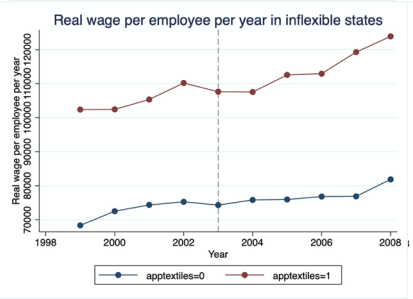
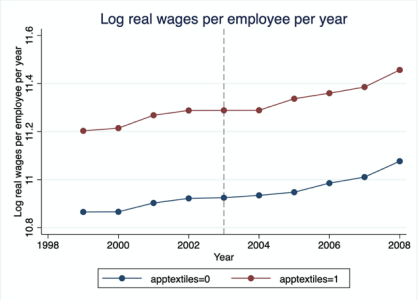
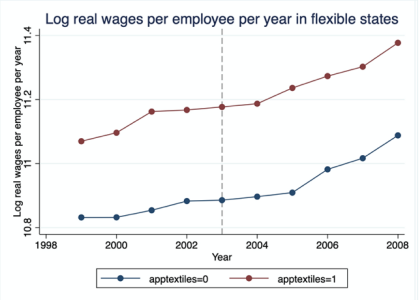


Figure 7.6: Timeplot of log real wages per employee per year for treatment and comparison groups, (i) across all states, (ii) in states with flexible labor laws, (iii) in states with inflexible labor laws





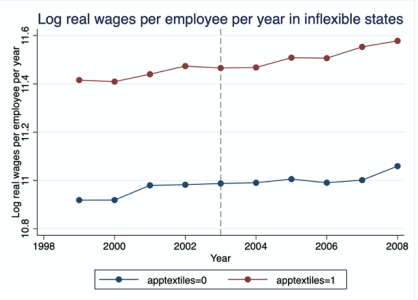
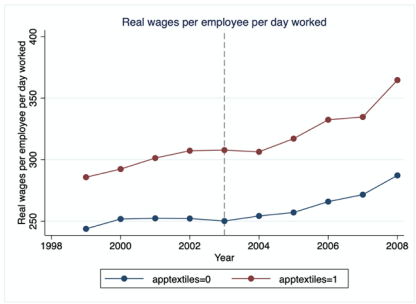
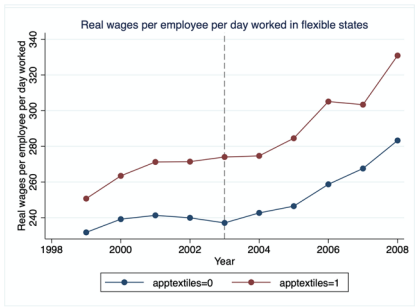


Figure 7.7: Timeplot of real wages per employee per day worked for treatment and comparison groups, (i) across all states, (ii) in states with flexible labor laws, (iii) in states with inflexible labor laws





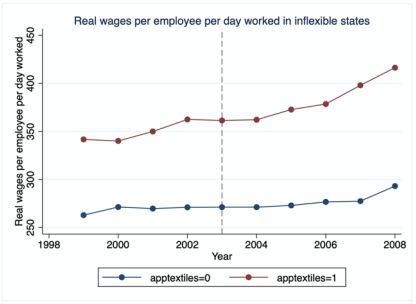
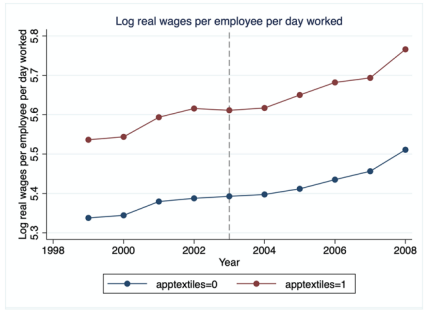
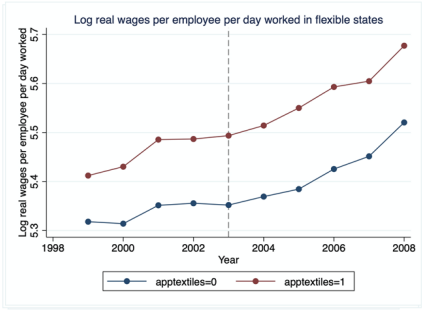
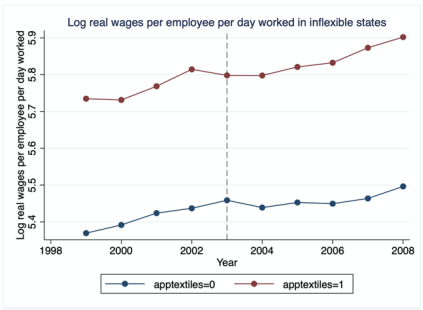


Figure 7.8: Timeplot of log real wages per employee per day worked for treatment and comparison groups, (i) across all states, (ii) in states with flexible labor laws, (iii) in states with inflexible labor laws







Tables 7.3 and 7.4 present regression analogues of the figures above. The four columns address:

1. Real wages per employee per year (mean by firm, in rupees)
2. Log real wages per employee per year
3. Real wages per employee per day worked (mean by firm, in rupees) [alternatively, real wages per worker-day]
4. Log real wages per employee per day worked

As in the previous section, Table 7.3 presents coefficient estimates for the model from the empirical framework while Table 7.4 presents the marginal difference-in-differences estimates.

From the third and fourth rows of Table 7.4, we see increases across measures of wages for apparel and textile firms relative to comparison group firms across both inflexible and flexible states, with different levels of statistical significance. This aligns with the theoretical framework from Chapter 4 where we saw that $\frac{dw}{dP} > 0$. For the most part, these increases are greater in both logs and levels for firms in inflexible states. For instance, from rows 3 and 4 we see that apparel and textile firms in inflexible states and those in flexible states see increases in real wages per employee per year of more than 5000 and 2000 rupees respectively, relative to comparison firms. While the increase is statistically significant at the 10% significance level for firms in inflexible states, it is not statistically significant for those in flexible states. From column (2), we also see these as increases of 1.9 percent and 1.3 percent in real wages per employee per year for apparel and textile firms in inflexible and flexible states respectively, relative to their controls. However, these estimates are statistically insignificant. As we saw in the summary statistics, mean real wages

were higher for apparel and textile firms in inflexible states than those in flexible states. Despite this, we see a comparable if not greater increase in wages for firms in inflexible states, in percentage terms.

From the second row of Table 7.4, we also see some statistically significant evidence for increases in wages for other labor-intensive firms in flexible states relative to those in inflexible states.

From the third row of Table 7.3, we see that the triple interactions for columns (2) and (4) are -0.6 percent and 0.8 percent for real wages at the per year or per worker-day level but are statistically insignificant. From the same row, we see that this coefficient is negative for real wages per employee per year and real wages per employee per day worked, with the latter decrease of 21.66 rupees in real wages per worker-day statistically significant at the 5% significance level. The difference in direction of the log and levels estimates for real wages per worker-day are a function of the different levels for the different types of firms, as we saw in the summary statistics.

Overall, there seems to be some evidence that workers in the apparel and textiles industry in states with inflexible labor laws fared at par with or slightly better than those in apparel and textiles firms in inflexible states and this aligns with the work of Hasan et. al (2007). These empirical results help us figure out the sign of $\frac{d}{d\tau}(\frac{dw}{dP})$ that was not well defined in our theoretical framework. This suggests that $\frac{d}{d\tau}(\frac{dw}{dP}) > 0$.

A possible explanation could be the greater bargaining power of workers in inflexible states that allows them to force firms to share rents from the export liberalization (Hasan et. al 2007). An important caveat to note here is the possible omitted variable bias driven by capital, a key variable that the ASI data lacks

clear measurements for. Here, we have focused on average firm-level wages and an explanation for the patterns we observe could be that firms in inflexible states have invested more in fixed capital and this difference shows up in a greater average productivity of labor (Basu et. al 1996). As another explanation, one could also expect that the first workers to shift to the apparel and textiles industry from other industries are the ones with the lowest productivity and given the greater increase in the number of employees for apparel and textile firms in flexible states, this decrease in average productivity could possibly explain the relatively greater dampening of the increase in firm-level average wages for apparel and textile firms in flexible states, than would have happened without the cross-sectional mobility.

Table 7.3: Regressing measures of wages on indicators for MFA abolition, industry classification, labor law flexibility and their interactions

	(1)	(2)	(3)	(4)
Coefficient of Interest	Real wages per employee per year (in Rupees)	Log real wages per employee per year	Real wages per worker-day (in Rupees)	Log real wages per worker-day
Apparel & Textiles * post-MFA	5162.06*	0.019	31.36**	0.023
	(2547.30)	(0.018)	(10.71)	(0.028)
Flexible * post-MFA	2680.58	0.064**	29.67**	0.044
	(2130.29)	(0.027)	(9.56)	(0.027)
Apparel & Textiles * Flexible * post-MFA	-2922.67	-0.006	-21.66**	0.008
	(2214.99)	(0.018)	(7.95)	(0.018)
Constant	70499.65***	10.945***	264.93***	5.409***
	(2837.46)	(0.045)	(15.80)	(0.032)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	130,097	131,726	130,097	130,097
Adjusted R^2	0.1433	0.0109	0.0325	0.0325

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table 7.4: Estimates of differences-in-differences for measures of wages

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Real wages per employee per year (in Rupees)	Log real wages per employee per year	Real wages per worker-day (in Rupees)	Log real wages per worker-day
Apparel & Textile, Flexible – Inflexible	-242.09	.057***	8.01	.052**
	(3546.25)	(.016)	(8.65)	(.019)
Others, Flexible – Inflexible	2680.57	.064**	29.67**	.043
	(2130.29)	(.027)	(9.56)	(.027)
Apparel & Textile – Others, Flexible	2239.39	.013	9.69	.031*
	(1534.86)	(.013)	(7.06)	(.015)
Apparel & Textile – Others, Inflexible	5162.06*	.019	31.35**	.023
	(2547.30)	(.018)	(10.71)	(.028)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01. Each row presents difference-in-differences estimates (i) between apparel and textile manufacturers in flexible states and apparel and textile manufacturers in inflexible states, (ii) between other manufacturers in flexible states and other manufacturers in inflexible states, (iii) between apparel and textile manufacturers in flexible states and other manufacturers in flexible states, and (iv) between apparel and textile manufacturers in inflexible states and other manufacturers in inflexible states.

7.2 Labor regulations and the MFA phaseout's effect on the distribution of employment/firm size and wages

We now turn to examining the distribution of employment (or firm size) and firm-level wages. We focus our attention on the most commonly used measures of firm size and firm-level wages – number of employees/workers and mean real wages per employee per year. It is important to note here that we are examining how the different quintiles shift in reaction to the demand shock and not how firms at different quintiles are affected by the demand shock. Though the latter would certainly be an important effect to measure, we leave it for future work since the absence of panel data precludes us from following a firm over time. As mentioned before, readers should hesitate from assigning a causal interpretation to the following results given the difference in identification strategy assumptions and conditions for a QTET.

7.2.1 Distribution of employment/firm size

Figures 7.9 and 7.10 present the firm size distribution, pre- and post the MFA phaseout, for the comparison group and the apparel and textiles industry, respectively. It is apparent that in both the industries, both before and after the MFA phaseout, the size distribution seems right-skewed and is dominated by the presence of smaller firms. In Figure 7.9, we see no discernible shift in the firm size distribution post the MFA phaseout for other labor-intensive industries. On the other hand, Figure 7.10 shows a small rightward shift in firm size for apparel and textiles firms, and this shift seems to be driven by larger firms.

Figures 7.11 and 7.12 help breakdown this shift in the distribution for the apparel and textiles industry in flexible and inflexible labor regimes, respectively. While both distributions seem to shift to the right, the difference in these shifts is difficult to perceive visually. These observations seem to match empirical regression and difference-in-difference estimates from Tables 7.5 and 7.6, respectively. From the third and the fourth row of Table 7.6, we see that the export liberalization drove, for apparel and textile firms in both flexible and inflexible states, a statistically significant rightward shift in the distribution. For instance, relative to comparison group, the 25th, 50th and 75th percentiles for apparel and textile firms in inflexible states moved rightwards by 19.6 percent, 20 percent and 28.7 percent respectively, which matches the visual inspection that the shifts seem to be driven by larger firms. These shifts are muted and statistically insignificant for the 99th percentile, which could be explained by slack or binding constraints on size. As was apparent on visual inspection from Figures 7.11 and 7.12, the coefficients on the triple difference in Table 7.5 show that there is no statistically significant difference between these two relative shifts.

These patterns also hold for regressing levels instead of logs. The regression coefficients and marginal difference-in-differences estimates for the levels are in the Appendix in Tables A.4 and A.5 respectively.

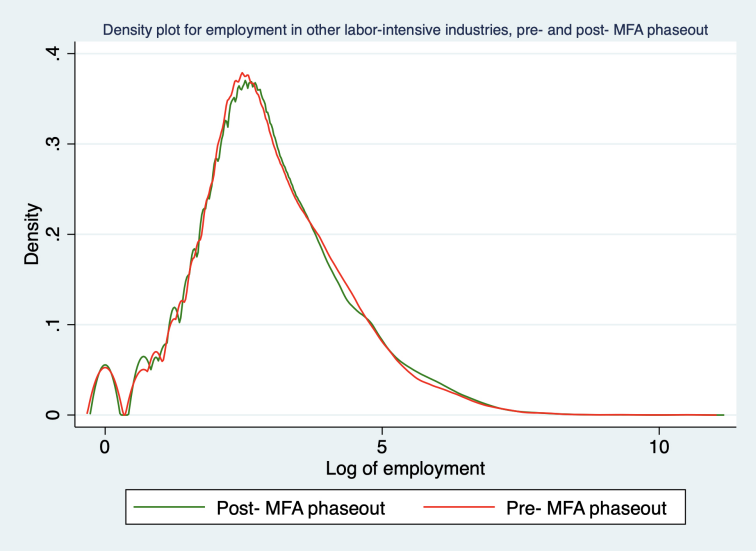


Figure 7.9: Firm-size distribution for other labor-intensive industries, pre- and post-MFA phaseout

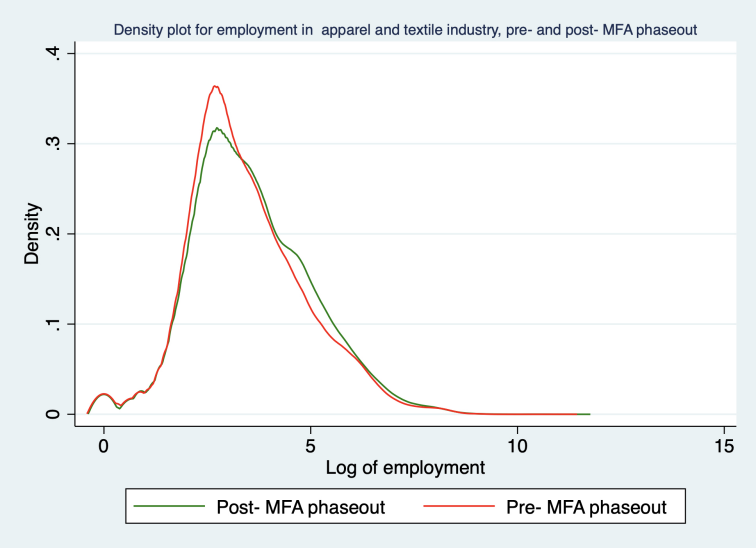


Figure 7.10: Firm-size distribution for apparel and textile industry, pre- and post-MFA phaseout

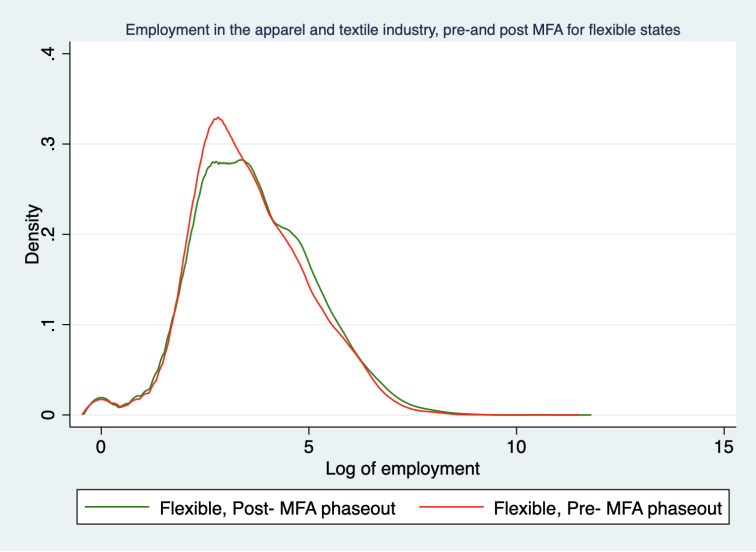


Figure 7.11: Firm-size distribution for apparel and textile industry firms in flexible states, pre- and post- MFA phaseout

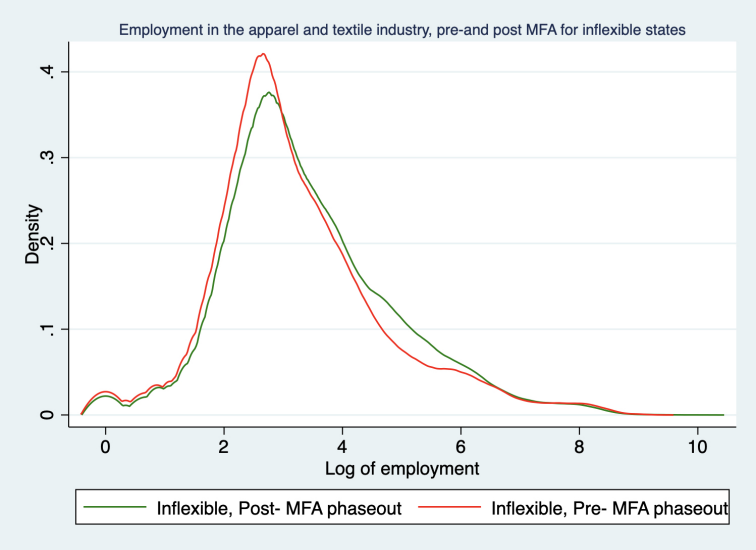


Figure 7.12: Firm-size distribution for apparel and textile industry firms in inflexible states, pre- and post- MFA phaseout

Table 7.5: Regressing quantiles for log employment on indicators for MFA abolition, industry classification, labor law flexibility and their interactions

	(1)	(2)	(3)	(4)
Coefficient of Interest	Log employment (25th percentile)	Log employment (50th percentile)	Log employment (75th percentile)	Log employment (99th percentile)
Apparel & Textiles * post-MFA	0.196***	0.200***	0.287***	-0.046
	(0.018)	(0.025)	(0.045)	(0.131)
Flexible * post-MFA	0.001	0.046**	0.102***	0.178**
	(0.011)	(0.017)	(0.023)	(0.063)
Apparel & Textiles * Flexible * post-MFA	-0.036	-0.016	-0.077	0.156
	(0.031)	(0.046)	(0.065)	(0.197)
Constant	2.153***	2.983***	3.949***	6.704***
	(0.143)	(0.178)	(0.224)	(0.218)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	130,097	130,097	130,097	130,097
Adjusted R^2	0.0087	0.0963	0.0109	0.1063

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table 7.6: Difference-in-difference estimates for quantiles of log employment

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Log employment (25th percentile)	Log employment (50th percentile)	Log employment (75th percentile)	Log employment (99th percentile)
Apparel & Textile, Flexible – Inflexible	-.035	.031	.025	.334
	(.029)	(.042)	(.060)	(.186)
Others, Flexible – Inflexible	.000	.046***	.101***	0.178**
	(0.011)	(0.017)	(0.023)	(0.063)
Apparel & Textile – Others, Flexible	.159***	.184***	.211***	.110
	(.025)	(.038)	(.047)	(.148)
Apparel & Textile – Others, Inflexible	0.196***	0.200***	0.287***	-0.046
	(0.018)	(0.025)	(0.045)	(0.131)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

7.2.2 Distribution of firm-level real wages

Figures 7.13 and 7.14 present the distribution of firm-level real wages, pre- and post the MFA phaseout, for the comparison group and the apparel and textiles industry, respectively. As we saw in section 7.1.2, there is a clear increase in the mean real annual wage per employee for both the industries. Breaking down the shift for the apparel and textiles industry, we consider Figures 7.15 and 7.16 which show the pre- and post- MFA phaseout distribution for firms in flexible and inflexible states, respectively. The shapes of the distributions pre- and post- for both the types of states are similar and to better examine how the distribution has changed, we turn to Tables 7.7 and 7.8 for regression and marginal difference-in-differences estimates. From Table 7.8, we see that for both flexible and inflexible apparel and textiles firms, all percentiles move to the right, relative to control.

These rightward shifts for the 50th, 75th and 99th quantiles of firm-level real wages and this could tally with the shifts in the distribution of firm size – if larger firms are more productive, you would expect them to be able to benefit more from the export liberalization.

These patterns also hold for regressing the absolute values of firm-size real wages. The regression coefficients and marginal difference-in-differences estimates are in the Appendix in Tables A.4 and A.5 respectively.

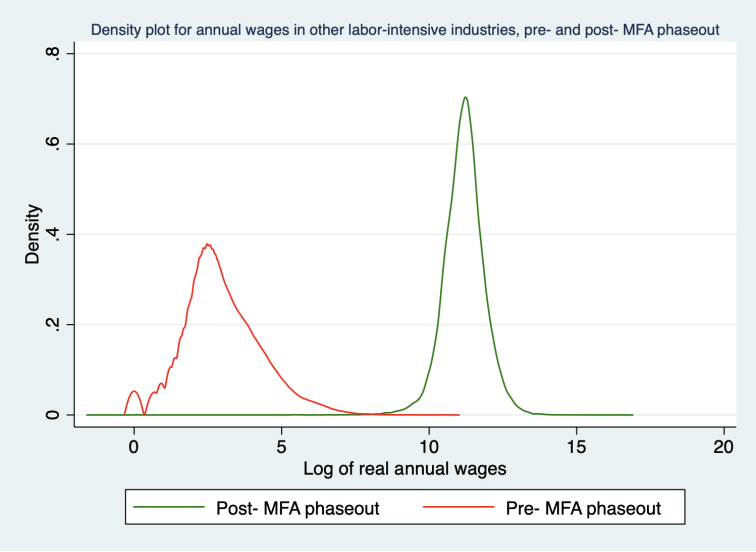


Figure 7.13: Distribution of firm-level real annual wages distribution for other labor-intensive industries, pre- and post- MFA phaseout

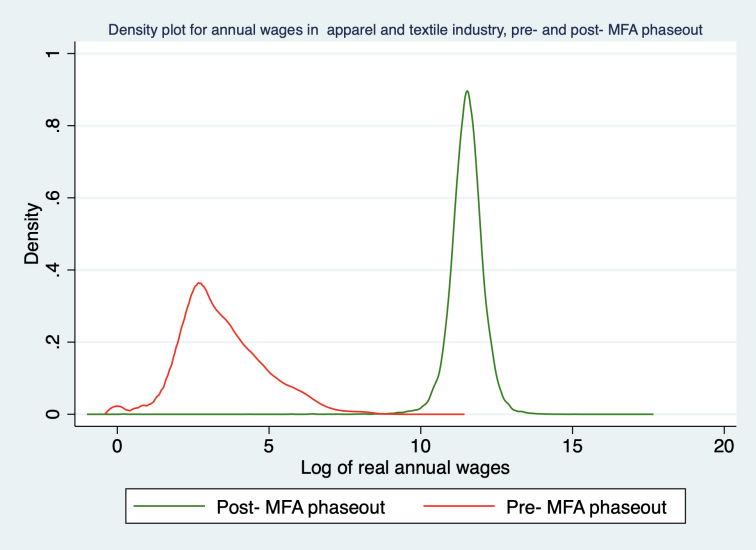


Figure 7.14: Distribution of firm-level real annual wages for apparel and textile industry, pre- and post- MFA phaseout

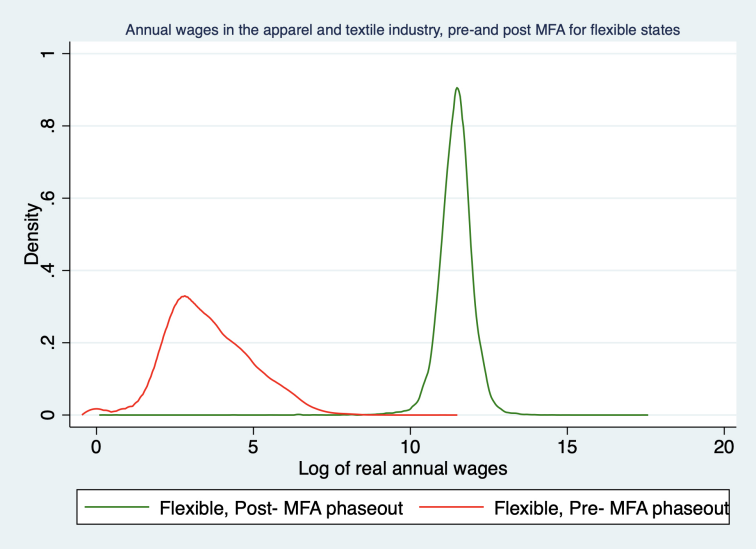


Figure 7.15: Distribution of firm-level real annual wages for apparel and textile industry in flexible states, pre- and post- MFA phaseout

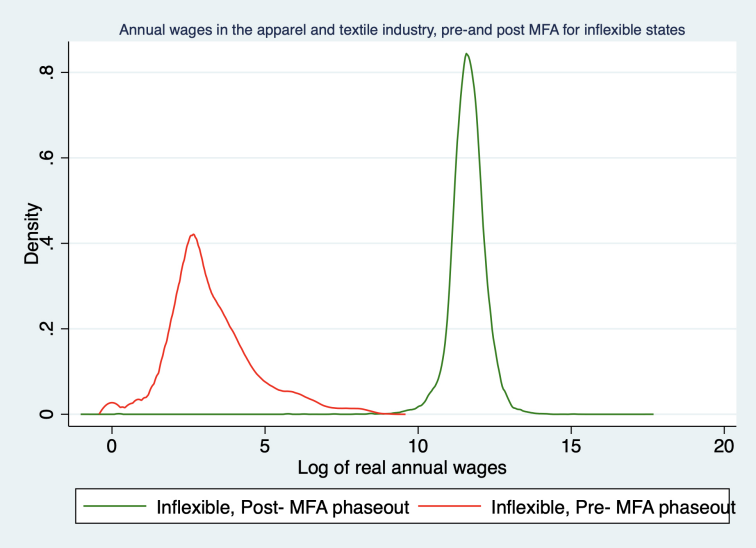


Figure 7.16: Distribution of firm-level real annual wages for apparel and textile industry in inflexible states, pre- and post- MFA phaseout

Table 7.7: Regressing quantiles for log real annual wages on indicators for MFA abolition, industry classification, labor law flexibility and their interactions

	(1)	(2)	(3)	(4)
Coefficient of Interest	Log real annual wages (25th percentile)	Log real annual wages (50th percentile)	Log real annual wages (75th percentile)	Log real annual wages (99th percentile)
Apparel & Textiles * post-MFA	0.072***	0.092***	0.112***	0.158***
	(0.011)	(0.011)	(0.015)	(0.047)
Flexible * post-MFA	0.129***	0.122***	0.142***	0.202***
	(0.009)	(0.006)	(0.007)	(0.029)
Apparel & Textiles * Flexible * post-MFA	-0.021	-0.053**	-0.102***	-0.287***
	(0.019)	(0.016)	(0.020)	(0.068)
Constant	10.577***	11.049***	11.528***	12.560***
	(0.044)	(0.058)	(0.119)	(0.619)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	130,097	130,097	130,097	130,097
Adjusted R^2	0.0087	0.0963	0.0109	0.1063

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table 7.8: Difference-in-difference estimates for quantiles of log real wages

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Log real annual wages (25th percentile)	Log real annual wages (50th percentile)	Log real annual wages (75th percentile)	Log real annual wages (99th percentile)
Apparel & Textile, Flexible – Inflexible	.108***	.069***	.040**	-.084
	(.017)	(.015)	(.018)	(.061)
Others, Flexible – Inflexible	0.129***	0.122***	0.142***	0.202***
	(0.009)	(0.006)	(0.007)	(0.029)
Apparel & Textile – Others, Flexible	.051***	.039***	.009***	-.128***
	(.016)	(.012)	(.013)	(.048)
Apparel & Textile – Others, Inflexible	0.072***	0.092***	0.112***	0.158***
	(0.011)	(0.011)	(0.015)	(0.047)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Chapter 8

Robustness Checks

We now turn to some important checks of robustness of our results for our main difference-in-differences empirical strategy from Section 7.1, which looked at the average treatment effect on employment and wages.

8.1 Parallel trends assumption

As mentioned earlier, a key assumption for our difference-in-differences identification strategy is that the treatment and comparison groups exhibited similar patterns in the pre-period and that absent the experiment or intervention, that trend would have continued. In section 7.1, most of the outcome variables seemed to exhibit parallel trends in timeplots.

As a way to test for parallel trends, we repeat our estimations for both employment and wages after restricting our sample to the pre-period and treating a random year as treatment. The estimates are presented in the appendix in Tables A.7 through A.10. Evidently, most of the marginal difference-in-differences and the coefficients on the triple interaction term are statistically insignificant. Coupled with the visual inspec-

tion of timeplots for outcome variables, the parallel trends assumption for treatment and control is perhaps reasonable.

8.2 Controlling for state-specific time trends

Though we have already controlled for state-fixed and time-fixed effects, it is important to control for state-specific time trends as well to see if underlying state-specific trends in our outcomes variables could be driving what we estimate as effects of the MFA phaseout. Drawing from Wolfers (2006), we add the interaction of state-fixed and time-fixed effects to our regressions as a way to control for state-specific linear trends. An example of such state-specific trends could be upskilling programs that might see faster implementation and adoption in states ruled by the same political party as that is in power at the federal level, than in states ruled by an opposing party. Thus, it could be that the increases in wages that we attribute to the MFA phaseout are instead being driven by an increase in skill levels of workers. For our estimates to be robust to state-specific time trends, we should not see big deviations in coefficients for our main specification. The regressions on measures of employment and wages are presented in Tables A.11 and A.12 in the appendix respectively. Clearly, our variables of interest (especially the triple interactive term) largely retain their magnitudes and significance. Thus it is reasonable to say that our estimates are robust to controlling for state-specific time trends.

8.3 Estimates using another classification of states by labor regulation flexibility

Another threat to identification could be that our measured effects are being driven not by the MFA phaseout itself, but by our chosen encoding of states as 'flexible',

'inflexible' or 'neutral'. To address this concern, we repeat our estimates from Section 7.1, but instead use the classification developed by Gupta, Hasan and Kumar (2008) (or GHK). The classification is presented in Table A.6) in the appendix. This encoding is similar to the one we use in our main specification in that it encapsulates information on a wide array of labor regulations. Here, 5 out of 15 states see a change in their classification. [1]

For employment, Tables A.13 and A.14 present regression results and marginal difference-in-differences estimates respectively. These are analogues of Tables 7.1 and 7.2 respectively. We see that the estimates using GHK's classification are comparable or greater in magnitude and have higher statistical significance. For instance, as compared to our triple difference of an increase of 17.82 workers from column (1) of Table 7.1, we now estimate an analogous triple difference of an increase of 24.09 workers from Tables A.13. While the triple difference for AHKP's encoding was statistically significant at the 10% level, this new triple difference is statistically significant at the 5% level.

Similarly for wages, Tables A.15 and A.16 are analogues of Tables 7.3 and 7.4 respectively. We again see comparable or greater magnitudes for the estimates and greater statistical significance. For instance, while we originally estimated a statistically insignificant triple interaction coefficient of -2922.67 rupees for real wages per employee per year in Table 7.3, the analogous value from column (1) of Table A.15 is -4686.978 rupees and is statistically significant at the 1% significance level. While we saw a -21.66 rupee estimate for the triple difference on real wages per worker-day that was significant at the 5% level, using GHK we estimate an analogues -25.361 rupees for the triple difference on real wages per worker-day and this is now

[1] Gujarat and Madhya Pradesh go from Flexible to Neutral, Kerala is switched from Inflexible to Neutral and Rajasthan is switched from Neutral to Flexible.

significant at the 1% significance level.

This robustness check reinforces our estimate of a statistically significant increase in employment and decrease in wages for apparel and textile firms in flexible states driven by the MFA liberalization (net of the change over time that is attributable to being in apparel and textiles, and of the change over time that is attributable to being in flexible states)

8.4 Excluding 'neutral' states from our sample

While we had bunched states classified as 'neutral' with 'inflexible' states, we now repeat our estimates excluding those 'neutral' states from our sample. For employment, Tables A.17 and A.18 in the Appendix are analogues of Tables 7.3 and 7.4, respectively. Similarly, Tables A.19 and A.20 in the Appendix are analogues of 7.3 and 7.4, respectively.

As one would expect, effects are larger in magnitude for both employment and wages across different measures. They also have greater statistical significance. For instance, instead of a triple difference of an increase of 17.82 workers from column (1) of Table 7.1, statistically significant at the 10% level, we now estimate an analogous triple difference of an increase of 37.28 workers significant at the 5% level, from Table A.17.

8.5 Omitted variable bias and endogeneity concerns

A plausible source of omitted variable bias in our model is fixed capital. It is possible that certain states encourage investment in fixed capital more than others or even that apparel and textile firms in inflexible states have transitioned to more capital-intensive processes as compared with those in flexible states. This could be a determinant of our firm-level measure of average wages which is affected by firm-level average productivity. The limitations of the ASI dataset do not allow for a clean measure of fixed capital stock and future work will likely have to consider other data sources to account for this source of omitted variable bias. However, such datasets are likely to come with their own tradeoffs – for instance, we could have used extensive data from the Centre for Monitoring Indian Economy's Prowess database of public companies but that analysis would restrict us to analyzing a very small slice of the whole industry.

A plausible threat to our identification strategy is possible endogeneity bias. One could argue that different states have different regulatory regimes because the states themselves are somehow different and thus our estimated differences in outcomes from liberalization could have something to do with these underlying differences. For instance, it is possible that states where people are more 'enterprising' and 'mobile' tend to make labor laws flexible.In future work, we can try to address these concerns of endogeneity by identifying a suitable instrumental variable or instead by considering other sources of variation in the regulatory burden on firms.

Chapter 9

Conclusion

Despite the recent slowdown, India's encouraging economic growth since liberalization in 1991 reflects an opportunity for the country to raise living standards and catapult its citizens into middle-income status by undertaking similar structural reforms. However, as our work has shown, there are important tradeoffs to consider here, especially when it comes to labor law reform.

In this paper, we focused on the pertinent areas of trade and labor law reform and used a difference-in-differences methodology to understand what labor laws can best serve the interests of workers. In particular, focusing on the phaseout of the Multi-Fiber Agreement restricting exports, we find that liberalization drives an increase in average employment and decrease in firm-level average wages for apparel and textile firms in flexible states, accounting for changes over time attributable to being in the textile industry or to being located in states with flexible labor laws. We also document an associated rightward shift in the distribution of firm size and firm-level average wages for the apparel and textiles industry, with a greater shift in the distribution of firm-level average wages for firms in states with inflexible labor regulations. While our analysis estimates how labor laws mediate the short-term

effects of trade liberalization, in future work it would be important to understand the longer-term implications for employment outcomes. Additionally, what might really matter for employees are not how the laws are written, but rather how they are implemented. Though it is encouraging to see a greater MFA phaseout-driven increase in employment for apparel and textile firms facing easier labor regulations, if our estimated downward effect on firm-level average wages reflects a decline in bargaining power of workers in flexible states, flexible labor laws might not exactly be the panacea for taking advantage of liberalization that one might think.

Appendix A

Appendix

A.1 Comparison of features of India's labor laws with those of China and the United States

Table A.1: Comparison of features of India's labor laws with those of China and the United States Source: World Bank Doing Business Report 2019

Economy	Minimum wage for a full-time worker (US$/month)	Ratio of minimum wage to value added per worker	Maximum length of probationary period (months)	Premium for overtime work (% of hourly pay)	Restrictions on night work?	Restrictions on overtime work?	Average paid annual leave (working days)?	Third-party notification if one worker is dismissed?	Average severance pay for redundancy dismissal (in salary weeks)
China (Shanghai)	353.3	0.3	6	50.0	No	No	6.7	Yes	13
China (Beijing)	291.9	0.3	6	50.0	No	No	6.7	Yes	13
India (Mumbai)	135.9	0.6	3	100.0	Yes	Yes	18.0	Yes	6.4
India (Delhi)	244.6	1.1	3	100.0	Yes	Yes	15.0	Yes	6.4
United States (NYC)	2181.2	0.3	n.a.	50.0	No	No	0.0	No	0.0
United States (LA)	1845.7	0.2	n.a.	50.0	No	No	0.0	No	0.0

Table A.2: Regressing quantiles for employment on indicators for MFA abolition, industry classification, labor law flexibility and their interactions

	(1)	(2)	(3)	(4)
Coefficient of Interest	Employment (25th percentile)	Employment (50th percentile)	Employment (75th percentile)	Employment (99th percentile)
Apparel & Textiles * post-MFA	2.000***	3.932***	13.177***	-29.065
	(0.307)	(0.550)	(2.549)	(197.508)
Flexible * post-MFA	0.000	0.381	3.074***	76.145*
	(0.108)	(0.253)	(0.865)	(30.934)
Apparel & Textiles * Flexible * post-MFA	0.000	3.646*	10.932*	217.536
	(0.505)	(1.432)	(4.778)	(236.976)
Constant	7.000***	22.154**	52.977***	849.125***
	(1.817)	(7.338)	(12.430)	(156.685)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	131726	131726	131726	131726
Adjusted R^2	0.0087	0.0963	0.0109	0.1063

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.3: Difference-in-difference estimates for quantiles of employment

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Employment (25th percentile)	Employment (50th percentile)	Employment (75th percentile)	Employment (99th percentile)
Apparel & Textile, Flexible – Inflexible	0	4.03***	14.00***	293.68
	(.49)	(1.40)	(4.70)	(235.01)
Others, Flexible – Inflexible	0.000	0.381	3.074***	76.145*
	(0.108)	(0.253)	(0.865)	(30.934)
Apparel & Textile – Others, Flexible	2***	7.58***	13.18***	188.47
	(.39)	(1.32)	(2.55)	(130.72)
Apparel & Textile – Others, Inflexible	2.000***	3.932***	13.177***	-29.065
	(0.307)	(0.550)	(2.549)	(197.508)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. * p<0.10, ** p<0.05, *** p<0.01.

Table A.4: Regressing quantiles for firm-level real annual wages on indicators for MFA abolition, industry classification, labor law flexibility and their interactions

	(1)	(2)	(3)	(4)
Coefficient of Interest	Real annual wages (25th percentile)	Real annual wages (50th percentile)	Real annual wages (75th percentile)	Real annual wages (99th percentile)
Apparel & Textiles * post-MFA	5119.719***	8744.601***	14385.491***	44159.079***
	(842.801)	(1151.409)	(1864.924)	(12223.674)
Flexible * post-MFA	5539.925***	7214.650***	11067.280***	47141.918***
	(369.050)	(380.051)	(516.457)	(4121.259)
Apparel & Textiles * Flexible * post-MFA	-930.991	-4048.340**	-10710.526***	-73663.654***
	(1134.233)	(1508.445)	(2289.861)	(14900.104)
Constant	36153.983***	61763.887***	115156.956***	366749.226***
	(3593.587)	(6104.154)	(18786.040)	(20502.607)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	130,097	130,097	130,097	130,097
Adjusted R^2	0.0087	0.0963	0.0109	0.1063

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.5: Difference-in-difference estimates for quantiles of log real wages

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Log real annual wages (25th percentile)	Log real annual wages (50th percentile)	Log real annual wages (75th percentile)	Log real annual wages (99th percentile)
Apparel & Textile, Flexible – Inflexible	4608.93***	3166.31**	356.75**	-26521.74*
	(1072.68)	(1459.93)	(2230.58)	(14414.08)
Others, Flexible – Inflexible	5539.925***	7214.650***	11067.280***	47141.918***
	(369.050)	(380.051)	(516.457)	(4121.259)
Apparel & Textile – Others, Flexible	4188.72***	4696.26***	3674.96***	-29504.57***
	(762.40)	(975.39)	(1335.04)	(8510.84)
Apparel & Textile – Others, Inflexible	5119.719***	8744.601***	14385.491***	44159.079***
	(842.801)	(1151.409)	(1864.924)	(12223.674)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. * p<0.10, ** p<0.05, *** p<0.01.

A.2 Data and tables for robustness checks

Table A.6: Alternative state-level index of labor regulation flexibility/rigidity

State	**Categorization (AHKP)**	**Categorization (GHK)**
Andhra Pradesh	Flexible	Flexible
Assam	Neutral	Neutral
Bihar	Neutral	Neutral
Gujarat	Flexible	Neutral
Haryana	Neutral	Neutral
Karnataka	Flexible	Flexible
Kerala	Inflexible	Neutral
Madhya Pradesh	Flexible	Neutral
Maharashtra	Inflexible	Inflexible
Orissa	Inflexible	Inflexible
Punjab	Neutral	Neutral
Rajasthan	Neutral	Flexible
Tamil Nadu	Flexible	Flexible
Uttar Pradesh	Flexible	Flexible
West Bengal	Inflexible	Inflexible

Note: These indices index covers the 15 major manufacturing states of India, which account for more than 92% of firms in India's apparel and textiles industry. Sources: Ahluwalia, Hasan, Kapoor and Panagariya (2018) and Gupta, Hasan and Kumar (2008)

Table A.7: Robustness Check: Restricting sample to pre-period and treating 2001-02 onwards as our treatment period. Regressing measures of employment on indicators for MFA abolition, industry classification, labor law flexibility and their interactions

	(1)	(2)	(3)	(4)
Coefficient of Interest	Employees (total by firm)	Log employees (total by firm)	Worker-days worked (total by firm)	Log worker-days worked (total by firm)
Apparel & Textiles * post-2001	-19.920	-0.055	-5964.488	-0.058
	(9.033)	(0.053)	(2665.702)	(0.066)
Flexible * post-2001	-15.585	-0.055	-4619.001	-0.035
	(10.501)	(0.047)	(3000.463)	(0.051)
Apparel & Textiles * Flexible * post-2001	26.594	0.181*	7511.169*	0.175*
	(17.765)	(0.066)	(2322.380)	(0.069)
Constant	-34.566	2.667***	-13739.372	8.187***
	(43.584)	(0.123)	(14468.772)	(0.120)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	54,281	53,800	54,281	53,733
Adjusted R^2	0.016	0.099	0.019	0.108

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2001-02 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.8: Robustness Check: Restricting sample to pre-period and treating 2001-02 onwards as our treatment period. Estimates of differences-in-differences for employment/firm size measures

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Employees (total by firm)	Log employees (total by firm)	Worker-days worked (total by firm)	Log worker-days worked (total by firm)
Apparel & Textile, Flexible – Inflexible	11.01	.126	2892.17	.139
	(5.14)	(.035)	(1954.778)	(.067)
Others, Flexible – Inflexible	-15.585	-0.055	-4619.001	-0.035
	(10.501)	(0.047)	(3000.463)	(0.051)
Apparel & Textile – Others, Flexible	6.67	.125*	1546.68	.116*
	(9.78)	(.064)	(2751.42)	(.051)
Apparel & Textile – Others, Inflexible	-19.920	-0.055	-5964.488	-0.058
	(9.033)	(0.053)	(2665.702)	(0.066)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2001-02 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01. Each row presents difference-in-differences estimates (i) between apparel and textile manufacturers in flexible states and apparel and textile manufacturers in inflexible states, (ii) between other manufacturers in flexible states and other manufacturers in inflexible states, (iii) between apparel and textile manufacturers in flexible states and other manufacturers in flexible states, and (iv) between apparel and textile manufacturers in inflexible states and other manufacturers in inflexible states.

Table A.9: Robustness Check: Restricting sample to pre-period and treating 2001-02 onwards as our treatment period. Regressing measures of wages on indicators for MFA abolition, industry classification, labor law flexibility and their interactions

	(1)	(2)	(3)	(4)
Coefficient of Interest	Annual real wages per employee (in Rupees)	Log annual real wages per employee	Real wages per worker-day worked (in Rupees)	Log real wages per worker-day worked
Apparel & Textiles * post-2001	685.587	-0.018	81.947**	-0.009
	(2808.273)	(0.028)	(22.194)	(0.023)
Flexible * post-2001	-1309.673	-0.009	38.971	-0.028
	(1751.633)	(0.027)	(27.889)	(0.016)
Apparel & Textiles * Flexible * post-2001	-19.013	0.025	-74.923	0.026
	(2094.340)	(0.031)	(39.689)	(0.016)
Constant	63419.777***	10.883***	253.638***	5.368***
	(3083.510)	(0.046)	(29.281)	(0.037)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	53800	53705	53733	53648
Adjusted R^2	0.145	0.195	0.003	0.243

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2001-02 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.10: Robustness Check: Restricting sample to pre-period and treating 2001-02 onwards as our treatment period. Estimates of differences-in-differences for measures of wages

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Annual real wages per employee (in Rupees)	Log annual real wages per employee	Real wages per worker-day worked (in Rupees)	Log real wages per worker-day worked
Apparel & Textile, Flexible – Inflexible	-1328.69	.016	-35.95	-.002
	(2265.66)	(.017)	(24.31)	(.019)
Others, Flexible – Inflexible	-1309.673	-0.009	38.971	-0.028
	(1751.633)	(0.027)	(27.889)	(0.016)
Apparel & Textile – Others, Flexible	666.57	.007	7.024*	.017
	(1159.28)	(.015)	(3.64)	(.009)
Apparel & Textile – Others, Inflexible	685.587	-0.018	81.947*	-0.009
	(2808.273)	(0.028)	(42.194)	(0.023)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01. Each row presents difference-in-differences estimates (i) between apparel and textile manufacturers in flexible states and apparel and textile manufacturers in inflexible states, (ii) between other manufacturers in flexible states and other manufacturers in inflexible states, (iii) between apparel and textile manufacturers in flexible states and other manufacturers in flexible states, and (iv) between apparel and textile manufacturers in inflexible states and other manufacturers in inflexible states.

Table A.11: Robustness Check: Controlling for state-specific linear time trends a la Wolfers (2006) in regressions for employment

	(1)	(2)	(3)	(4)
Coefficient of Interest	Employees (total by firm)	Log employees (total by firm)	Worker-days (total by firm)	Log worker-days (total by firm)
Apparel & Textiles * post-MFA	11.07	0.132	2791.62	0.141
	(12.26)	(0.067)	(4032.61)	(0.089)
Flexible * post-MFA	-1.13	-0.036	-540.91	-0.036
	(4.07)	(0.040)	(1336.46)	(0.036)
Apparel & Textiles * Flexible * post-MFA	16.81**	0.054	3602.41	0.027
	(6.32)	(0.082)	(3142.76)	(0.087)
Constant	77.43***	4.017***	15430.93***	10.649***
	(10.03)	(0.066)	(2989.38)	(0.052)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State*Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	131,726	130,097	131,726	129,982
Adjusted R^2	0.0189	0.0823	0.0091	0.0932

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.12: Robustness Check: Controlling for state-specific linear time trends a la Wolfers (2006) in regressions for wages

	(1)	(2)	(3)	(4)
Coefficient of Interest	Annual real wages per employee (in Rupees)	Log annual real wages per employee	Real wages per worker-day (in Rupees)	Log real wages per worker-day
Apparel & Textiles * post-MFA	4572.99**	0.013	26.15**	0.017
	(2283.42)	(0.029)	(11.45)	(0.032)
Flexible * post-MFA	2138.46	0.057**	24.67**	0.036
	(1903.26)	(0.041)	(10.46)	(0.028)
Apparel & Textiles * Flexible * post-MFA	-2645.71	-0.002	-19.64**	0.004
	(2414.96)	(0.017)	(9.13)	(0.020)
Constant	81423.77***	11.432***	274.06***	5.478***
	(2532.33)	(0.033)	(15.59)	(0.052)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State*Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	130,097	131,726	130,097	130,097
Adjusted R^2	0.1433	0.0109	0.0325	0.0325

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.13: Robustness check using an alternate classification of states by labor regulation flexibility (GHK 2008). Regressing employment/firm-size measures on indicators for MFA abolition, industry classification, labor law flexibility and their interactions

	(1)	(2)	(3)	(4)
Coefficient of Interest	Employees (total by firm)	Log employees (total by firm)	Worker-days worked (total by firm)	Log worker-days worked (total by firm)
Apparel & Textiles * post-MFA	9.927	0.153**	2774.018	0.145*
	(11.042)	(0.062)	(3529.835)	(0.067)
Flexible * post-MFA	-2.385	-0.061	-810.073	-0.044
	(5.607)	(0.043)	(1384.633)	(0.041)
Apparel & Textiles * Flexible * post-MFA	24.090**	0.043	4768.373	0.037
	(11.194)	(0.043)	(2946.948)	(0.052)
Constant	55.928***	3.015***	15568.474***	8.556***
	(10.131)	(0.092)	(3048.673)	(0.083)
Firm-level & Controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	131726	130097	131726	129982
Adjusted R^2	0.009	0.093	0.011	0.103

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.14: : Robustness check using an alternate classification of states by labor regulation flexibility (GHK 2008). Estimates of differences-in-differences for employment/firm-size measures.

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Employees (total by firm)	Log employees (total by firm)	Worker-days worked (total by firm)	Log worker-days worked (total by firm)
Apparel & Textile, Flexible – Inflexible	21.71**	-.019	3958.30	-.007
	(8.31)	(.028)	(2302.99)	(.032)
Others, Flexible – Inflexible	-2.385	-0.061	-810.073	-0.044
	(5.607)	(0.043)	(1384.633)	(0.041)
Apparel & Textile – Others, Flexible	34.02*	.195***	7542.39	.182***
	(15.80)	(.043)	(4741.67)	(.037)
Apparel & Textile – Others, Inflexible	9.927	0.153**	2774.018	0.145*
	(11.042)	(0.062)	(3529.835)	(0.067)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01. Each row presents difference-in-differences estimates (i) between apparel and textile manufacturers in flexible states and apparel and textile manufacturers in inflexible states, (ii) between other manufacturers in flexible states and other manufacturers in inflexible states, (iii) between apparel and textile manufacturers in flexible states and other manufacturers in flexible states, and (iv) between apparel and textile manufacturers in inflexible states and other manufacturers in inflexible states.

Table A.15: Robustness check using an alternate classification of states by labor regulation flexibility (GHK 2008). Regressing measures of wages on indicators for MFA abolition, industry classification, labor law flexibility and their interactions.

	(1)	(2)	(3)	(4)
Coefficient of Interest	Annual real wages per employee (in Rupees)	Log annual real wages per employee	Real wages per worker-day worked (in Rupees)	Log real wages per worker-day worked
Apparel & Textiles * post-MFA	6177.975***	0.025*	32.632***	0.035
	(1658.754)	(0.012)	(6.341)	(0.020)
Flexible * post-MFA	2175.953	0.054**	20.260***	0.037
	(1892.565)	(0.023)	(5.846)	(0.020)
Apparel & Textiles * Flexible * post-MFA	-4686.978***	-0.016	-25.361***	-0.011
	(1237.099)	(0.013)	(5.018)	(0.015)
Constant	70731.827***	10.945***	267.018***	5.409***
	(2743.005)	(0.043)	(16.408)	(0.031)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	130,097	129,985	129,982	129,883
Adjusted R^2	0.1444	0.1966	0.0058	0.2371

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.16: Robustness check using an alternate classification of states by labor regulation flexibility (GHK 2008). Estimates of differences-in-differences for measures of wages.

	(1)	(2)	(3)	(4)
(Post-Pre) Differences-in-difference	Annual real wages per employee (in Rupees)	Log annual real wages per employee	Real wages per worker-day worked (in Rupees)	Log real wages per worker-day worked
Apparel & Textile, Flexible – Inflexible	-2511.03	.038*	-5.10	.026
	(3016.86)	(.009)	(6.59)	(.017)
Others, Flexible – Inflexible	2175.953	0.054*	20.260**	0.037
	(1892.565)	(0.023)	(5.846)	(0.020)
Apparel & Textile – Others, Flexible	1490.00	.009	7.27	.024*
	(1779.71)	(.014)	(5.53)	(.018)
Apparel & Textile – Others, Inflexible	6177.975***	0.025*	32.632***	0.035
	(1658.754)	(0.012)	(6.341)	(0.020)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01. Each row presents difference-in-differences estimates (i) between apparel and textile manufacturers in flexible states and apparel and textile manufacturers in inflexible states, (ii) between other manufacturers in flexible states and other manufacturers in inflexible states, (iii) between apparel and textile manufacturers in flexible states and other manufacturers in flexible states, and (iv) between apparel and textile manufacturers in inflexible states and other manufacturers in inflexible states.

Table A.17: Robustness check excluding states with neutral labor regulations from sample. Regressing employment/firm-size measures on indicators for MFA abolition, industry classification, labor law flexibility and their interactions.

	(1)	(2)	(3)	(4)
Coefficient of Interest	Employees (total by firm)	Log employees (total by firm)	Worker-days worked (total by firm)	Log worker-days worked (total by firm)
Apparel & Textiles * post-MFA	-7.220	0.060	-3018.264	0.043
	(15.179)	(0.068)	(4265.516)	(0.071)
Flexible * post-MFA	-1.856	-0.094**	-987.949	-0.089
	(6.626)	(0.045)	(1911.218)	(0.051)
Apparel & Textiles * Flexible * post-MFA	37.283**	0.133**	9809.892*	0.132**
	(15.361)	(0.065)	(4352.976)	(0.062)
Constant	58.379***	2.997***	16331.552***	8.555***
	(8.927)	(0.064)	(2847.915)	(0.064)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	106,487	104,957	106,487	104,859
Adjusted R^2	0.0081	0.0995	0.0102	0.1087

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.18: Robustness check excluding states with neutral labor regulations from sample. Estimates of differences-in-differences for employment/firm-size measures.

	(1)	(2)	(3)	(4)
(Post-Pre) Difference-in-difference	Employees (total by firm)	Log employees (total by firm)	Worker-days (total by firm)	Log worker-days (total by firm)
Apparel & Textile, Flexible – Inflexible	35.43***	.039	8821.94***	.043
	(8.88)	(.071)	(2531.14)	(.079)
Others, Flexible – Inflexible	-1.856	-0.094**	-987.949	-0.089
	(6.626)	(0.045)	(1911.218)	(0.051)
Apparel & Textile – Others, Flexible	30.06*	.192***	6791.63	.174***
	(13.83)	(0.030)	(4510.39)	(.019)
Apparel & Textile – Others, Inflexible	-7.220	0.060	-3018.264	0.043
	(15.179)	(0.068)	(4265.516)	(0.071)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.19: Robustness check excluding states with neutral labor regulations from sample. Regressing measures of wages on indicators for MFA abolition, industry classification, labor law flexibility and their interactions.

	(1)	(2)	(3)	(4)
Coefficient of Interest	Annual real wages per employee (in Rupees)	Log annual real wages per employee	Real wages per worker-day (in Rupees)	Log real wages per worker-day
Apparel & Textiles * post-MFA	8393.284**	0.028	47.718**	0.050
	(2966.300)	(0.037)	(17.317)	(0.044)
Flexible * post-MFA	1688.311	0.049	40.812**	0.045
	(3058.505)	(0.039)	(16.704)	(0.040)
Apparel & Textiles * Flexible * post-MFA	-6125.751**	-0.016	-37.499**	-0.019
	(2063.036)	(0.036)	(16.546)	(0.039)
Constant	70620.519***	10.943***	253.674***	5.389***
	(2917.303)	(0.047)	(13.630)	(0.037)
Firm-level controls	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Errors	Clustered	Clustered	Clustered	Clustered
Observations	104,957	104,858	104,859	104,772
Adjusted R^2	0.1396	0.1817	0.0049	0.2156

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01.

Table A.20: Robustness check excluding states with neutral labor regulations from sample. Estimates of differences-in-differences for measures of wages.

	(1)	(2)	(3)	(4)
(Post-Pre) Differences-in-difference	Annual real wages per employee (in Rupees)	Log annual real wages per employee	Real wages per worker-day (in Rupees)	Log real wages per worker-day
Apparel & Textile, Flexible – Inflexible	-4437.44	.032***	3.31	.026**
	(3761.1)	(.009)	(5.97)	(.011))
Others, Flexible – Inflexible	1688.311	0.049	40.812**	0.045
	(3058.505)	(0.039)	(16.704)	(0.040)
Apparel & Textile – Others, Flexible	2267.53	0.049	10.22	.031*
	(1591.23)	(.012)	(6.86)	(.015)
Apparel & Textile – Others, Inflexible	8393.284**	0.028	47.718**	0.050
	(2966.300)	(0.037)	(17.317)	(0.044)

Note: Standard errors are clustered at the state and two-digit industry level. We consider the year 2003-04 onwards as our post-period. A worker-day is a measure of labor where 1 worker-day = 1 worker*1 day of work. * p<0.10, ** p<0.05, *** p<0.01. Each row presents difference-in-differences estimates (i) between apparel and textile manufacturers in flexible states and apparel and textile manufacturers in inflexible states, (ii) between other manufacturers in flexible states and other manufacturers in inflexible states, (iii) between apparel and textile manufacturers in flexible states and other manufacturers in flexible states, and (iv) between apparel and textile manufacturers in inflexible states and other manufacturers in inflexible states.

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