

Multinationals and Anti-Sweatshop Activism

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During the 1990s, anti-sweatshop activists campaigned to improve working conditions and raise wages for workers in developing countries, particularly in Southeast Asia. This paper analyzes the impact of anti-sweatshop campaigns in Indonesia on wages and employment. Identification is based on comparing the wage growth of unskilled workers in foreign-owned and exporting firms in the textiles, footwear, and apparel sectors before and after the initiation of anti-sweatshop campaigns; special attention is paid to those firms operating in regions specifically targeted by activists because of their high concentration of “name brand” companies such as Nike, Adidas, and Reebok. We find that anti-sweatshop campaigns led to large real wages increases for targeted enterprises. We also examine whether higher wages led these firms to cut employment or relocate elsewhere. The results suggest that there were some costs in terms of reduced investment, falling profits, and increased probability of closure for smaller plants, but we fail to find significant effects on employment.

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I. Introduction

Anti-sweatshop campaigns increased dramatically in the 1990s. These campaigns took different forms: direct pressure to change legislation in developing countries, pressure on firms, newspaper campaigns, and grassroots organizing. Activists targeted corporate retail giants in textiles, footwear, and apparel sectors and helped spread consumer boycotts throughout college campuses. Yet there has been almost no academic research that analyzes precisely how these anti-sweatshop campaigns affected the very workers they were designed to assist.

This paper examines the impact of anti-sweatshop activism on labor market outcomes in Indonesia. Indonesia makes an ideal case study because it was the focus of campaigns introduced in the 1990s to improve conditions for workers. The pressure took several forms. The United States threatened to withdraw special tariff privileges for Indonesian exports if Indonesia failed to address human rights issues. The Indonesian government responded by making minimum wage increases a central component of its labor market policies in the 1990s.¹ The nominal minimum wage quadrupled and the real value of the minimum more than doubled between 1989 and 1996 (Figure 1). Indonesia was also the target of consumer awareness campaigns waged against companies such as Nike, Adidas, and Reebok. As a result of activist pressure, these firms were induced to sign codes of conduct pledging them to raise wages and improve working conditions in factories producing their products.

We identify the impact of anti-sweatshop campaigns on wages through two approaches. First, we compare wage growth in textiles, footwear, and apparel plants (referred hereafter as TFA plants) relative to wage growth in the rest of manufacturing. Our particular focus is on foreign-owned and exporting TFA factories which were the targets of activist campaigns. Second, we exploit geographic variation in the anti-sweatshop movement *within* the TFA sector in Indonesia. The anti-sweatshop campaign in Indonesia targeted contractors for Nike, Reebok, and Adidas. Consequently, we compare the real wage growth of TFA plants in districts with contractors working for Nike, Reebok, and Adidas, relative to TFA

plants in other districts. The advantage of this second approach to identification is that it controls for any changes that affected the TFA sector as a whole.

To measure the impact of the anti-sweatshop movement, we use a difference-in-difference methodology, comparing wages before and after the advent of the anti-sweatshop campaigns. Both approaches indicate that targeted plants increased real wages in response to activist pressure. Compared to non-TFA plants, foreign-owned and exporting TFA firms increased real wages 10 to 20 percent more across all of Indonesia (Table 2). Comparing wage growth in districts targeted by activists relative to other districts, the effects are even larger. Real wages increased as much as 30 percent in large foreign-owned and exporting TFA plants relative to other TFA plants (Table 3). Most of these wage increases are due to higher compliance with minimum wages on the part of targeted plants.

One question which arises is whether such large real wage increases led to higher unemployment. Our estimates suggest that there were large, negative effects of the minimum wage increases on aggregate manufacturing employment. The coefficient on the minimum wage indicates that a ten percent increase in the real minimum wage reduces production worker employment by 1.2 percent. However, we fail to find significant negative effects on employment of the additional wage increases at targeted TFA plants. Employment growth in the TFA sector exceeded growth in other sectors during the sample time period. Although TFA plants increased wages in large part by increasing compliance with minimum wages, greater compliance was not associated with additional employment losses relative to non-TFA plants.

One explanation for why the short run employment costs of the anti-sweatshop campaigns are difficult to identify is that TFA plants had the flexibility to adjust to higher wages along other dimensions. Some plants exited the sector; small exporters in regions targeted by activists were more likely to close. Across all TFA plants, profits fell relative to other sectors. Profit declines were largest in the districts targeted by anti-sweatshop activities. It appears that the anti-sweatshop movement resulted in a type of

¹ For a discussion of the role of minimum wages in Indonesia, see SMERU Research Institute (2001) or Rama (1996).

forced profit sharing, where higher wages for TFA workers were financed largely through lower returns to capital.

Our results are robust to a range of alternative specifications. We include controls for confounding factors that are likely to be correlated with wage growth, including changes in plant size, the educational attainment of the workforce, region-specific variation in minimum wage changes, foreign-ownership, export status, investments in technology, productivity growth, different initial wage levels, differences in output growth, and changes in profitability. We also contrast the changes in wages for unskilled (production) workers with those for skilled (non-production) workers, whose wages generally exceeded the statutory minimum. Finally, we show that wages in foreign-owned and exporting firms in our treatment districts, but outside of the TFA sectors, were not affected.

The remainder of the paper is organized as follows. In Section II, we outline the development of anti-sweatshop campaigns, discuss the identification strategy, and set up a framework for estimation. We present results on wages in Section III. Section IV examines the impact of anti-sweatshop activism on employment, profits, investment, plant entry and exit, and explores the extent to which the results reflect different degrees of compliance with minimum wage laws. Section V concludes.

II. Background, Identification Strategy, and Framework for Estimation

Background

The roots of the anti-sweatshop campaign in Indonesia can be traced to a 1989 study commissioned by the U.S. Agency for International Development. The study, carried out by the Asian American Free Labor Institute-Indonesia under the direction of Jeff Ballinger, discovered that of all the factories that produced goods for the export sector, plants that manufactured for Nike paid the lowest wages.² Organizations such as Global Exchange, Press for Change (founded by Ballinger), and the National Labor Committee used the momentum generated from the increasing mainstream media

attention on poor factory conditions in Nike plants to create an international campaign against sweatshop conditions in factories contracting for Nike.³

The campaign against Nike's contractors in the early 1990s focused almost exclusively on Indonesia. One major reason is that much of the research documenting poor working conditions and low minimum wage compliance was completed by Jeff Ballinger while working for the AFL-CIO in Indonesia; no comparable work was carried out in China (currently the site of the largest number of Nike contractors). In addition, significant anger was directed against the foreign (primarily East-Asian) owners of these sub-contracting factories within Indonesia. The relatively more open political atmosphere (compared to China) also contributed to the ability of U.S. groups to work with local NGOs in Indonesia.

The reasons for the focus on Nike, and to a lesser extent Reebok and Adidas, are also clear. Nike, Reebok, and Adidas have accounted for over 50 percent of the global market share in sportswear apparel and footwear since the late 1990s, making them natural targets. Nike in particular provided a perfect centerpiece for the anti-sweatshop campaigns since the Nike symbol was highly recognizable and the company had a popular athlete as its spokesman.⁴ Under mounting pressure, Nike established its own codes of conduct in 1992 in order to comply with labor standards and establish living wages, but these practices were not fully implemented until 1995-1996.⁵ During this period, non-governmental organizations (NGOs) maintained persistent and steady appraisals of working conditions in and around Nike vendor factories in order to hold the company to account for the treatment of its workers.

The campaign against Nike, Adidas, and Reebok in Indonesia was essentially a media campaign, which operated (and continues to operate) through contacts with newspaper columnists, magazine writers, TV shows, and other outlets. One way to gauge the extent of negative media exposure brought about by

² In 1992 Ballinger's work appeared in Harper's Magazine in a short piece entitled, "The New Free-Trade Hell: Nike's profits jump on the backs of Asian workers," and in 1993 CBS featured Ballinger in a report about poor working conditions in Asian factories.

³ Coupled with media strategies, including ads that satirized Nike symbols and slogans (e.g. the "swooshtika" in place of the Nike "swoosh" symbol), the anti-sweatshop activists waged a public relations war against Nike and other big clothing retailers. The movement in the U.S. and Europe was assisted by electronic forums where young activists shared information and planned their campaigns.

⁴ That athlete was Michael Jordan

⁵ See Murphy and Matthew (2001).

the anti-sweatshop campaigns is to count the number of articles about sweatshops and child labor that appeared in major international newspapers in the 1990s.⁶ As Figure 2 demonstrates, the number of articles about sweatshop and child labor activities increased dramatically during this decade. There was a 300 percent increase in the number of articles regarding child labor and the number of articles focusing on sweatshop activities increased by more than 400 percent.

If we restrict the analysis to articles about sweatshops in Indonesia alone, the trends are very similar. In Figure 3 we compute the ratio of the number of articles on sweatshops or child labor relative to articles on general economic issues on Indonesia in major world newspapers. Figure 3 shows that the percentage increased from zero to a high of ten percent of all articles at the peak in 1996. In 1997 there was an increasing shift in focus towards the financial crisis, which erupted at the end of 1997. Interest in child labor and sweatshop labor fell in the late 1990s—at least relative to other issues of economic interest—but has been increasing again in the last several years.

Further evidence regarding the development of anti-sweatshop activism can be found in Elliott and Freeman (2003). The authors systematically trace the development of these campaigns in the 1990s. Their book makes clear that the overwhelming majority of new organizations created to address labor conditions in sweatshop industries were formed in the early 1990s.⁷

While previous studies do not directly address the impact of anti-sweatshop activism on wages, an excellent overview of foreign ownership and wages can be found in Brown, Deardorff, and Stern

6 The list of “Major US and World Publications” is available on the website for Lexis-Nexis. Examples include the New York Times, Business Week, The Economist, Newsweek, The Boston Globe, The Times (London), The Christian Science Monitor, The Herald (Glasgow), The Washington Post, Hong Kong Standard, etc. We also analyzed the trends for US newspapers alone, available from the authors upon request. The trends are very similar whether we restrict the analysis to US newspapers or use all major international sources.

7 Why did interest in these issues increase so rapidly in the mid 1990s? In 1996-1997, there were a series of high profile exposes on Nike, Gap, Wal-Mart, Disney and others. For instance, in the second quarter of 1996 the Kathie Lee Gifford sweatshop scandal was highlighted in the news. These exposes were picked up by student movements on campuses. Student groups staged protests and sit-ins and subsequently kept these issues in the news, and contributed to the creation of groups designed to respond to sweatshop problems. The convergence of high profile exposes, student activism, and the creation of new groups designed to address anti-sweatshop concerns fueled the increase in newspaper coverage. Post-1996, the shift in focus towards the Asian financial crisis contributed to a decline in interest in these issues. The student movement also weakened and moved on to other issues. This section has benefited greatly from discussions with Kimberly Elliott, Dara O’Rourke, and Sandra Spolaski.

(2004).⁸ A discussion of the links between trade and labor standards is provided by Brown (2001). Other related work includes Edmonds and Pavcnik (2001), who explore how rice prices affected the use of child labor in Vietnam.⁹ Previous work has also examined the rationale for labor standards, as well as the determinants of ratification of ILO conventions.¹⁰

Identification

Our identification strategy is two-fold. First, anti-sweatshop activism in Indonesia was uniquely focused on firms in the TFA sectors. Consequently, we begin by comparing real wage growth in those sectors versus other sectors, paying particular attention to the foreign-owned and exporting firms most likely to act as suppliers or contractors.¹¹ Real wages are calculated by deflating the nominal wage by the CPI, where the CPI is equal to 100 in 1996.

Our second treatment exploits the fact that anti-sweatshop activists in Indonesia concentrated on contractors for the three most highly visible retailers: Nike, Adidas, and Reebok. While Nike, Adidas, and Reebok did not take equity positions in their contractors, they did source heavily from foreign-owned and exporting firms whose owners came from other parts of Asia, including Korea, Taiwan, and Japan. Nike's primary mode of operation was (and continues to be) through arms-length contracts. Unfortunately, confidentiality restrictions do not permit us to identify the *actual* contractors in the census data (since firm names are withheld in the Indonesian census data made available to researchers). Instead, we have identified likely contractors using census data on foreign-ownership, export status, and district of

8. For an early paper showing that foreign-owned enterprises in developing countries are more likely to pay higher wages than comparable domestically-owned enterprises, see Aitken, Harrison and Lipsey (1997)

⁹ Edmonds and Pavcnik find that in rural areas, where most people are both rice producers and consumers, the income effect of higher rice prices has greatly outweighed the higher opportunity costs of not employing children in the work force, and therefore child labor has declined significantly. However, in urban areas, where families are only rice consumers, the effects of the rice exports on price has led to increases in child labor since urban incomes have declined. Since Vietnam is predominantly rural, the overall effect has been a decline in child labor.

¹⁰ Chau and Kanbur (2001) postulate that if ratification of these conventions was costless, or if the benefits greatly outweighed the costs, one would expect complete compliance across countries. Given that this is not the case, Chau and Kanbur investigate the determinants of signing. They find little evidence that variables predicted by standard economic theory—such as per capita gross domestic product (GDP), degree of openness to trade, or average education—are determining factors, but rather that countries with higher domestic standards have a higher probability of adoption. Maskus (1996) refutes the argument that a lack of international standards has led to significant erosion of low-skilled wages in developed countries, or is a significant determinant of trade performance and foreign direct investment throughout the developing world.

¹¹ Our analysis is focused on real wages; we only refer to nominal wages periodically to contrast the two since inflation was high during the 1990s.

operation. Using information released by all three companies regarding the locations of their contractors in Indonesia, we have identified the districts in which companies targeted by activists operated in the 1990s. Consequently, our second approach compares the changes in wages and employment in TFA plants in regions with Nike, Adidas, and Reebok contractors, relative to other regions.

One important limitation is that our list of vendors for Nike, Adidas, and Reebok (available from the authors upon request) is from 2004. Since the vendor list is more recent than our census data, there could be a selection bias in our identification of treatment districts. It is difficult to sign the direction of the bias, since it is equally likely that only the pro-worker or anti-worker vendors have survived. However, by matching the names of enterprises described in newspaper accounts of sweatshops in Indonesia with names that appeared in the 2004 list of Nike vendors, we have been able to verify that many of the companies initially accused of the worst exploitation are still operating in Indonesia.

To give us a preliminary indication of whether the treatment group was affected by anti-sweatshop activism, Figure 4 shows the distribution of unskilled wages for 1990 and 1996 for exporters and foreign-owned plants. We define unskilled wages as the plant's total production worker compensation divided by the number of production workers. Consequently, unskilled wages are an average of production worker wages at the establishment level. Production workers are generally associated with "unskilled" workers and non-production workers are generally associated with "skilled" workers, although that association is not exact. Nevertheless, Figure 1 shows that average wages for non-production workers were two to four times higher than for production workers during the sample period.

Figure 4 shows the distribution of production worker wages for plants in the TFA sector (our first treatment group) and those outside of TFA (our first control group) in 1990 and 1996.¹² The wage distributions show mean real wages outside of the TFA sector remained the same between 1990 and 1996. For TFA firms, however, the peak of the distribution shifted to the right and the spread narrowed even more. While the lower tail of the distribution was fatter for TFA firms prior to the anti-sweatshop

¹² A two-sample Kolmogorov-Smirnov test for equality of distribution functions rejects the equality of the control and treatment distributions both in 1990 and 1996.

campaigns, after treatment the lower tail was much smaller than for the control group. As indicated in Figure 4, wages in TFA plants increased and the distribution narrowed relative to plants in other sectors.

Figure 5 presents our second approach, which is restricted to only TFA plants. Now the treatment changes from belonging to the TFA sector to being located in a district with anti-sweatshop activity. Figure 5 shows the distribution of production worker wages for enterprises in districts without anti-sweatshop activity and those with anti-sweatshop activity.¹³ For both the treatment and control groups, the mean real wage shifted to the right, confirming that average wages in the TFA sector increased relative to the rest of manufacturing (see Figure 4). The distribution of log wages was initially quite broad, reflecting the fact that there was no binding wage floor, the government's minimum wages were not particularly high, and enforcement was lax. However, by 1996, the picture had changed considerably. The wage distribution for unskilled (production) workers is now much narrower, reflecting a squeeze on the left and right parts of the wage distribution.¹⁴

While plants in the treatment group were paying less than other TFA plants in 1990, by 1996 the peak had shifted to the right of the control group, indicating that these firms were now paying more. Of equal interest is the shift in the lower tails of the distribution for the treatment group. The lower tail of the wage distribution on the left-hand side of the graph has shrunk significantly for the treatment group relative to other TFA enterprises with exports or foreign ownership. These shifts in the distribution of wages are consistent with (but do not prove) the increasing importance of anti-sweatshop activism, as they point to greater wage increases in foreign-owned and exporting TFA firms in treatment districts.

Framework for Estimation

13 In the tables which follow, none of the changes are driven by foreign contractors purchasing the higher-wage-paying domestic firms since all our estimates are based on the balanced sample of enterprises present in both 1990 and 1996. The econometric results in the paper and the trends in Figures 4 and 5 are robust to using either a balanced or unbalanced sample which includes entering and exiting plants.

14 A two-sample Kolmogorov-Smirnov test for equality of distribution functions indicates that we cannot reject the null hypothesis that distribution of log production worker wages are the same for the control and treatment group in 1990. However, in 1996, a Kolmogorov-Smirnov test indicates that we can reject at the 1 percent level the null hypothesis that these two distributions are the same.

A proper framework for evaluating a firm's decision to raise wages in the context of anti-sweatshop activism would take into account both the costs and benefits of setting wages above the market-clearing level. In a competitive market with no external pressures, a worker's wages are set equal to the value of their marginal product. This implies that if log real wages are given by w , the log product price is p , the marginal product of labor is given by the partial derivative of output (Y) relative to labor input (L), worker or region-specific characteristics are captured by the vector Z , then a standard log-linear reduced form wage equation for an establishment i in region r at time t is given by:

$$\log w_{irt} = a_1 + a_2 \log p_{irt} + a_3 \log(\delta Y / \delta L)_{irt} + \alpha_4 Z_{irt} + r_{rt} + f_i + e_{it} \quad (1)$$

Since there are likely to be a number of establishment-specific effects (f_i) as well as time-varying regional effects (r_{rt}) that are unobserved, we will estimate (1) in differences, thus eliminating the establishment-level fixed effects but not the regional effects which are allowed to vary over time. We model the costs and benefits of setting wages above the market-clearing level as a function of $G(\mathbf{u}, \mathbf{F})_{it}$ where G represents a markup over competitive wages and is a positive function of the probability of exposure by activists (\mathbf{u}) and any official sanctions F associated with violating labor market regulations. G could, for example, measure the costs in terms of foregone sales or lost contracts due to negative publicity if the firm failed to adhere to minimum wages. This yields the following equation:

$$d \log w_{irt} = a_2 d \log p_{irt} + a_3 d \log(\delta Y / \delta L)_{irt} + \alpha_4 d Z_{irt} + G(\mathbf{u}, \mathbf{F})_{it} + r'_{rt} + e'_{it} \quad (2)$$

Clearly, not all firms face the same probability of detection or the same penalties associated with operating sweatshop factories; only those with high probability of detection \mathbf{u} or costly penalties associated with detection F are likely to change their wage-setting behavior.

As human rights activism and anti-sweatshop organizations proliferated, the probability of detection and the penalty for paying low wages or failing to adhere to the minimum wage increased, particularly for firms with high visibility such as large multinationals or well-established exporters. We

allow the treatment to vary with both export status and foreign-ownership, defined prior to treatment at the beginning of the sample period. We define export status *EXP* and foreign-ownership *FOR* as dummy variables equal to one if the establishment exported 10 percent or more of its output or had 10 percent or more foreign-ownership in 1990 and continued to do so over the entire sample period.

We explore two alternative treatments. We alternatively define *TREATMENT* as equal to one if one of the following is true:

- (1) The plant was in a **TFA** sector at the beginning of the period
- (2) The plant operated in a district that had contractors for Nike, Reebok, or Adidas.

Allowing the impact of activism to vary depending on whether the contractor is a foreign-owned or exporting enterprise leads to the following specification for $G(F,u)$:

$$G(F,u)=b_1EXP_{it0}+b_2FOR_{it0}+b_3TREATMENT_{it0}+b_4(EXP*TREATMENT)_{it0}+b_5(FOR*TREATMENT)_{it0}$$

Consequently, introducing deviations from competitive wage setting due to activism leads to:

$$d\log w_{irt} = a_2 d\log p_{irt} + a_3 d\log(\delta Y/\delta L)_{irt} + \alpha_4 dZ_{irt} + b_1 EXP_{it0} + b_2 FOR_{it0} + b_3 TREATMENT_{it0} + b_4 (EXP*TREATMENT)_{it0} + b_5 (FOR*TREATMENT)_{it0} + r_{rt} + e'_{it} \quad (3)$$

Equation (3) is essentially a difference-in-difference approach to estimating the impact of anti-sweatshop campaigns on wage outcomes. We regress log change in real wages (with 1996 as the base year) between 1990 and 1996 on a number of determinants, and then test whether there is any difference for our two treatment groups. Since firms that sub-contracted for the major TFA multinationals were typically either foreign-owned or export-oriented or both, we focus primarily on the interaction terms \mathbf{b}_4 and \mathbf{b}_5 .

We include controls for a number of potentially confounding determinants of the observed wage changes. We control for price changes using changes in log output and profitability at the level of the individual establishment. Factors which affect the marginal product of labor are also included in the estimation, including changes in capital stock, changes in material inputs, technology expenditures, total factor productivity growth, and changes in firm size, defined as the change in the total number of employees. Other components of the vector dZ include changes in worker characteristics (specifically education levels) and changes in the statutory minimum wage.

To give the reader an idea of the importance of TFA enterprises for manufacturing employment in Indonesia in the 1990s, Figure 6 shows the share of TFA employees in total production worker employment. Employment in the TFA sector as a share of total production worker employment increased from 25 percent to 35 percent during the period. The percentage of production workers in foreign-owned TFA plants rose from 2 percent to over 5 percent, while the percentage of production workers in TFA exporting plants increased from 5 to nearly 20 percent. Figure 6 shows that TFA plants employed a major share of production workers in the manufacturing sector in Indonesia.

III. Wages and Anti-Sweatshop Activism in Indonesia

Data Summary

The data for this analysis comes from the annual manufacturing survey of Indonesia collected and compiled by the Indonesian government's statistical agency BPS (Badan Pusat Statistik). The completion of this survey is mandatory under Indonesian law for firms with more than 20 employees. The number of observations ranges from approximately 13,000 in 1990 to over 18,000 in 1999. Over the ten year period there is an average of 4.5 observations per establishment, reflecting either plant closings or changing reporting requirements.

We begin by reporting mean real wages in (in 000's of 1996 Rupiahs) for the manufacturing sector in 1990 and 1996 in the first two rows of Table 1A. We focus on this seven-year period because

information on export orientation was not collected before 1990, and the financial crisis which erupted in 1997 makes any evaluations post-1996 problematic.¹⁵ As indicated earlier, we define the plant's average wage for both production and non-production workers as basic compensation (salary) by type of worker, divided by the number of workers in that skill category. For the remainder of the analysis, we focus almost exclusively on production worker wages, which we use as our measure of unskilled wages.

Based on an exchange rate of about 2,000 rupiahs to the dollar, real annual wages for TFA and non-TFA domestic plants at the onset of the sample period averaged approximately 550 US dollars. If we compare columns (1) and (4), we see that wages in non-exporting, domestically owned plants were remarkably similar at the onset of the sample period. Between 1990 and 1996, average annual production worker wages in both TFA and non-TFA domestic enterprises increased by about 200 US dollars.

However, at the onset of the sample period both foreign-owned and exporting TFA enterprises paid their unskilled workers significantly less than other enterprises. In 1990, a comparison of columns (2) and (5) shows that workers in foreign-owned TFA plants were paid half as much as workers at other foreign-owned plants. In the first row, comparing columns (3) and (6) indicates that exporters in TFA plants paid their workers 30 percent less than in other exporting plants. These large differences were one factor that contributed to the focus of anti-sweatshop activists on workers in the TFA sector. One question which naturally arises is why these workers were paid so little. While one explanation could be the low level of skill of these workers, the regressions in the remainder of the paper control for the observed skill composition of workers in each establishment, and firm-level fixed effects control for unobserved skill differences which remain constant over time. An important consideration which could explain the wage differences is the high concentration of female production workers in these sectors. Three of the five most female-intensive sectors (with female production workers accounting for 50 percent or more of total production workers) in Indonesian manufacturing in 1995 were textiles, footwear, and apparel.¹⁶ Even in

15 Nevertheless, we have experimented with adding 1997 and show that the main results presented in Tables 2 and 3 are robust to extending the sample. These results are available from the authors upon request.

16 In Indonesia, the share of female workers in the census is highly inversely correlated with wages. These results are available from the authors upon request.

the United States, Altonji and Blank (1999) review the existing evidence and report that female-dominated occupations pay significantly less, after accounting for all observable worker characteristics.

By 1996, the wage gap between exporting and foreign-owned TFA and exporting and foreign-owned non-TFA plants had narrowed considerably. In 1996, the difference in wages between exporting TFA and exporting non-TFA plants amounted to only 46,000 rupiahs (23 dollars) per employee per year. The difference—computed in the last column of Table 1A—is not statistically significant. The gap between wages in foreign-owned TFA enterprises and foreign-owned non-TFA firms also narrowed, but by less: foreign-owned non-TFA establishments continued to pay 1,529 thousand rupiahs or 750 dollars more per worker in total salary in 1996 (second row, column (8)) than foreign-owned TFA firms. The trends in Table 1A suggest that the wage benefits from anti-sweatshop activism were limited to workers in export-oriented or foreign-owned plants.

Rows (3) and (4) of Table 1A report wage growth from 1990 to 1996 in levels; rows (5) and (6) report the wage growth in logs. The difference-in-difference—the difference in wage growth across TFA and non-TFA plants—is reported in the last three columns of Table 1A. The results show that wage increases for TFA workers were significantly higher in exporting and foreign-owned establishments. Again, the only exception is for workers in domestically-owned plants selling only locally: in these plants, wages for TFA workers increased by 7 percentage points less than for unskilled workers in other sectors. The difference-in-difference between foreign or exporter wage growth in the TFA and non-TFA sectors is reported in the last two rows and last two columns of Table 1A. Across all plants, exporting and foreign TFA plants increased real wages by 21 to 27 percent more than other plants. For the balanced panel, the wage increase for foreign or exporting plants relative to non-TFA plants is between 14 and 19 percent.

To summarize, the trends presented in Table 1A indicate very different patterns of wage growth for TFA plants in the 1990s. While production workers in most exporting and foreign-owned plants generally received smaller wage increases than the rest of the manufacturing labor force in the 1990s, *the*

opposite was true for workers in TFA factories. In foreign-owned and exporting TFA plants, unskilled wages grew 30 to 40 percent in real terms between 1990 and 1996.

Table 1B examines differences in the two treatment groups and the control groups prior to the onset of the anti-sweatshop movement. We test the difference in means for 1988 through 1990 for wages, size, profits, and growth in wages, productivity, and output. The pre-treatment period is short due to data limitations prior to 1988; nevertheless, performing the same tests on wages, size, and output for 1984 through 1989 yielded similar results. Size is defined as total number of employees. Profitability is defined as value-added less wages as a share of value-added. Total factor productivity growth is defined as the log change in output less the weighted changes in inputs, where inputs include production and non-production workers, materials, and capital stock. The weights are equal to an average of the shares of each of the inputs in total costs in the current and last period. The capital share is the residual, computed after subtracting the other factor shares and assuming constant returns to scale.

The first two columns provide t-tests of differences between the TFA sector and other non-TFA manufacturing sectors. The results show that TFA establishments paid lower wages and were larger than establishments in other sectors, but that initial profits were not significantly different. Variables measured in changes—including log changes in wages, production workers, material inputs, capital stock, and total factor productivity growth (defined below) were not significantly different. There are no significant differences between the control and treatment groups when wages, output, inputs (including production workers) and productivity are measured in changes. Since the difference-in-difference methodology used in the paper to identify treatment effects relies on changes rather than levels, the fact that there are no statistically significant differences between the treatment and control groups when examining growth rates between 1988 and 1990 is reassuring.

The last two columns of Table 1B report the results of t-tests when the treatment is TFA enterprises in districts with Nike, Reebok, and Adidas contract establishments (our second treatment group) versus TFA enterprises in other districts (our second control group). As expected, differences between the treatment and control group are even smaller when we compare different sets of firms within

the same manufacturing sub-sector. Although treatment firms paid significantly lower wages prior to the onset of the anti-sweatshop movement than the control group, they were similar in size and earned almost identical profits prior to treatment. In changes, the differences between treatment and control groups are never statistically significant, whether we examine wage growth, output growth, production worker growth, material inputs, capital stock, or productivity growth.

Main Results

None of the tests of mean differences in Table 1A control for differences in plant characteristics. We address this shortcoming in Tables 2 and 3, which present the main results of the paper. Table 2 presents the results of estimating equation (3), with TREATMENT defined as belonging to the TFA sector. The dependent variable is the change in the log wage between 1990 and 1996. The first column of Table 2 reports coefficient estimates when we include only ownership dummies for foreign-ownership, export orientation, and participation in the treatment group, the minimum wage, and interactions between TREATMENT, foreign-ownership, and export orientation. The minimum wage is defined as the log of the minimum wage in the district where the plant operated in 1996 less the log of the minimum wage in 1990. If that difference is negative, indicating that the minimum wage was not binding in 1990, then the minimum wage is set at zero. This definition of minimum wage changes allows the impact of increases in the minimum wage to be nonlinear, with a zero impact on the firm's wage if the minimum wage is not binding and an expected log-linear impact if the minimum wage is binding.¹⁷

The results are consistent with the difference-in-difference presented in Table 1A; while wages in most foreign-owned or exporting plants did not increase faster than in other plants, TFA establishments were the exception. The coefficient on TREATMENT for foreign-ownership or exporting enterprises is very similar: .106 for foreign and .119 for exporting. Controlling for the impact of minimum wage

¹⁷ In the dataset, 73 percent of plants had average wage levels below the 1996 regional minimum wage in 1990; for these plants, the real minimum wage increased by 70 percent. For the remaining 27 percent of plants with initial wages above the 1996 minimum, the change in the minimum wage was set to zero. Across all plants, the average increase in the (real) minimum wage was 50 percentage points.

changes, the results suggest that production worker wages in foreign-owned or exporting TFA plants grew 10.6 to 11.9 percent faster than in other plants.

Column (2) in Table 2 adds a number of controls to the basic specification. Plant controls include log changes between 1990 and 1996 in real material inputs and capital stock, plant size, region controls, total factor productivity growth, technology expenditures, and output growth. The results in column (2) also include details on educational attainment for employees at the individual plant (reported in the years 1995 through 1997 and averaged in our estimation across all three years). For production workers, the annual survey reports number of both male and female workers who have had no school, some primary school, junior high school, senior high school, and college. The addition of plant characteristics and educational attainment of the workers does not change the magnitude or significance of the coefficients on `Foreign*TREATMENT` and `exporting*TREATMENT`, which are now .124 and .110 respectively. These additional controls allow us to reject alternative explanations for the increase in wages for foreign-owned enterprises, such as the fact that foreign owners may have invested in plants with higher productivity growth, higher output growth, or better trained workers.

Since the point estimates for `foreign*TREATMENT` and `exporting*TREATMENT` are very close, in column (3) we combine foreign-ownership and exporting status into one variable, `FOREXP`. Most foreign-owned enterprises in Indonesia exported a majority of their output, so it is difficult to separately identify the impact of foreign-ownership and export status on wage growth. The remaining specifications in Table 2 combine foreign-ownership and export status, although the results are not dependent on doing so. Column (4) tests whether the results are sensitive to excluding plants whose primary product is textiles and retaining only plants producing apparel and footwear. The point estimate on `FOREXP` in column (4) is now .097, which suggests that wages for unskilled workers in this sector increased by 9.7 percentage points more than in other sectors, after controlling for worker and plant characteristics.

In columns (1) through (4) we include the minimum wage as a control. However, both the decision to comply with the minimum wage and its actual level could be considered endogenous. Later in

the paper we explore the determinants of compliance with the minimum wage as a function of anti-sweatshop activism. In Appendix Table 2, we show that minimum wage levels in Indonesia during the sample period were highly correlated with the consumer price index (CPI), lagged wages in the previous period, and low export shares. Appendix Table 2 shows that minimum wages were set at a higher level in treatment districts with Nike, Reebok, and Adidas contractors. To address this possible endogeneity, we eliminate the minimum wage as a control in column (5). Now the coefficient on TREATMENT interacted with FOREXP is equal to .202, suggesting that the net effect of FOREXP and higher compliance with the minimum wage was to increase real wages by 20.2 percent relative to other sectors.

Columns (6) and (7) test whether firms cut non-wage benefits to offset the higher wages induced by minimum wage changes and activist pressure. The results show that treatment firms did not. When the dependent variable is non-wage benefits in column (6), the coefficient on FOREXP*TREATMENT is close to zero and not significant. Column (7) reports the results when wages and non-wage benefits are added together. Since wages account for most of the income for unskilled workers, the results are very similar in magnitude to those reported in the first six columns. The coefficient estimate, equal to .096, suggests that real wages and non-wage benefits increased by 9.6 percentage points more for TFA firms than for other firms.

To demonstrate that the anti-sweatshop movement was primarily focused on unskilled workers, in column (8) we use log wages for non-production workers as our dependent variable instead of production wages. As indicated earlier, non-production workers are typically associated with skilled workers. Since the anti-sweatshop movement focused on poorly paid workers we would expect the impact on skilled workers to be small; this specification also allows us to test whether we are picking up spurious effects of positive unobserved demand shocks. The results suggest that there was no significant impact of FOREXP*TREATMENT on non-production worker wage growth. The coefficient estimate is -.057 and not statistically significant.

The coefficient on the minimum wage is also reported in Table 2. The coefficient is equal to .675 when all controls are added, which suggests that a 1 percent increase in the real value of the minimum

wage was associated with a .675 percent increase in the real unskilled wage. The coefficient is robust to the addition of plant, worker, and region controls. We note that it is possible to add region controls because the minimum wage is set at the more disaggregated district level. Given a 50 percentage point increase in the constructed minimum wage facing the sample firms (see footnote 17), the coefficient implies that minimum wage increases were associated with a 34 percent increase in real wages.

In Table 3, the sample includes only TFA plants and TREATMENT is defined as being located in districts with Nike, Adidas, or Reebok contractors. This smaller sample allows us to compare the evolution of wages within the TFA sector across treatment and control districts—between those that were the target of anti-sweatshop campaigns and those that were not. The coefficient on FOREXP alone is generally negative and significant for large firms (those defined as having 100 or more employees), indicating that on average foreign-owned or exporting enterprises had lower wage growth than other firms. In addition, the coefficient on TREATMENT alone is also negative and significant for large firms, indicating lower than average wage growth in the treatment districts. However, foreign-owned or exporting enterprises in treatment districts—those enterprises targeted by the activists—exhibited significantly higher wage growth. Large foreign-owned or exporting TFA firms in these districts exhibited wage growth *between 22 and 52 percent higher* in real terms than other enterprises, after controlling for worker and plant characteristics. While the coefficient on FOREXP*TREATMENT is positive and significant in columns (1), (2), (4), and (6), it is negative for small enterprises.

Robustness Tests

Tables 4 and 5 present robustness tests. Columns (1) and (2) of Table 4 add the log of production workers as an additional control variable. In columns (3) and (4), we control for the fact that targeted plants had unusually low wages. We saw in Table 1B that wages were significantly lower in treatment plants prior to the onset of the anti-sweatshop movement (although wage growth, the variable of interest, was comparable across treatment and control districts). We control for low initial wages by adding a dummy variable equal to one if the firm paid below the 1996 minimum wage in 1990. The coefficients on FOREXP*TREATMENT are unaffected by the addition of these controls, although the coefficient on

the minimum wage itself becomes insignificant. Columns (5) and (6) add profit margins as a control, to address the possibility that differences in product types or export opportunities could account for wage growth differentials. The addition of profit margins does not affect the results.

In the first three columns of Table 5, we perform a series of “nonsense” regressions by replacing the dummy variable for TFA plants with a dummy variable for other sectors. There is no indication of significant positive wage growth for exporting or foreign firms outside of the TFA sector. The coefficients on TREATMENT and the interactions with FOR and EXP (where treatment now indicates belonging to a sector other than TFA) are generally insignificant and have no consistent sign. The first three columns of Table 5 indicate that the unexplained component of wage growth observed between 1990 and 1996 is restricted to only plants in the TFA sectors.

We perform one more test of robustness using nonlinear matching techniques. To test whether there is something “special” about the treatment districts which could lead to spurious results within a chosen sector, we redo our estimation using as TREATMENT the affected districts (those with Nike, Reebok, or Adidas vendors) for each manufacturing sector separately. While a number of approaches are possible for estimating treatment effects using non-linear matching techniques, we adopt a procedure using nearest neighbor matching as outlined by Abadie, Drukker, Herr, and Imbens (2004).

This approach allows us to estimate average treatment effects of anti-sweatshop activism on wage growth, using as controls those firms which match most closely those firms that have been treated. To identify the most appropriate control group (the “nearest neighbor”), one must specify a list of covariates. For the treatment effects reported in the last column of Table 5, we include as our set of covariates all the controls reported in the first six columns of Table 2 except the minimum wage (which is not included because of our concern about possible endogeneity and is highly collinear with location). Enterprises in the control group are matched to the treatment group on the basis of location, size, output growth, growth in capital stock, growth in material inputs, educational attainment of the work force, total factor productivity growth, and investments in technology.

It is not possible in the context of our matching estimation to allow for multiple treatment effects simultaneously. Consequently, in column (4) of Table 5, TREATMENT is simply defined as being a foreign-owned *or* exporting enterprise (FOREXP) located in districts with anti-sweatshop activism. The impact of activism on wages estimated using nonlinear matching is remarkably similar to the OLS results reported in the first two columns of Table 3. Anti-sweatshop activism is associated with wage increases of between 19 and 27 percent in real terms. In the remaining rows of the last column of Table 5, we substitute all the remaining sectors for treatment and show that the effects are only significant and positive for TFA enterprises. These results are restricted to plants with at least 100 workers, since it is clear from Table 2 that the effects of both the minimum wage and the anti-sweatshop movement are restricted to large firms.

The results in Tables 1 through 5 suggest that wages increased systematically more for large exporting and foreign-owned TFA plants in treatment districts relative to other plants with similar characteristics. In addition to the average 34 percent increase in real wages induced by the minimum wage changes across all establishments, real wages rose an additional 10 percent for TFA relative to non-TFA establishments (Table 2). Within the TFA sector, treatment plants experienced even larger real wage increases, ranging up to 43 percent even after controlling for minimum wage increases (Table 3). The combined effects of the minimum wage legislation and the anti-sweatshop campaigns consequently increased real wages at least 45 percent for production workers in targeted exporting or foreign-owned plants. Below, we explore whether these wage gains had other potentially adverse effects; e.g. whether these wage gains may have led to employment losses and falling investment, or caused plants to shut down operations in Indonesia.

IV. Other Outcomes

Employment

The orthodox approach to minimum wages suggests that an increase in mandated wages should lead to a fall in employment, as employers are driven up their labor demand curve. Prior to the 1990s,

standard textbook treatments of minimum wages reported that imposing a wage floor would lead to adverse consequences for employment. However, a series of influential studies published by David Card and Alan Krueger in 1994 and 1995 changed the debate on the employment effects of minimum wages. In their subsequent book, Myth and Measurement: The New Economics of the Minimum Wage (1997), Card and Krueger argue that the imposition of a minimum wage need not have negative employment consequences if there are imperfections in the labor market. These imperfections include the following possibilities: (1) the existence of monopsony employers (2) search costs for employers and (3) efficiency wages. If any of these three imperfections characterize the local labor market, an increase in the minimum wage (or an increase in compliance with the existing minimum wage) could lead to an increase or no change in employment.

This unorthodox finding, which has caused an enormous debate among labor economists, has interesting implications for labor market policies in developing countries. If policy makers can raise wages by increasing the statutory minimum or encouraging compliance with the existing minimum without increasing unemployment, then minimum wage policies could become a powerful tool for combating poverty. This was precisely the thinking behind a 1995 World Bank Report which strongly recommended the introduction of a national minimum wage to reduce poverty in Trinidad and Tobago.

One consequence of this debate in the United States has been to encourage a number of new studies on the impact of minimum wages on employment in developing countries. Strobl and Walsh (2000) examine the impact of a national minimum wage introduced in Trinidad and Tobago in 1998. Bell (1997) examines the impact of minimum wages in Colombia and Mexico, and Maloney and Nunez (2000) examine the impact of minimum wages in eight Latin American countries. Rama (1999) and SMERU (2001) also examine the impact of the rising minimum wage on employment in Indonesia. The results are mixed. Bell (1997) finds that minimum wages in Colombia led to employment declines, while the minimum wage in Mexico had no impact on employment. Strobl and Walsh (2000) find inconclusive effects for Trinidad and Tobago, in part because the minimum wage was not enforced. All these studies present evidence that suggests a widespread lack of compliance with the legislated minimum wage.

In Table 6, we repeat the type of analysis presented in Table 1 and use the same type of difference-in-difference approach adopted by Card and Krueger (1994) to examine the impact of minimum wages and anti-sweatshop activism on employment in Indonesia. The first row reports the number of production workers in 1990, and the second row reports the number of production workers in 1996. The third row reports the difference for all plants, while the fourth row reports the difference in employment between 1990 and 1996 only for plants with data on employment in both years. Columns (1) through (3) report employment for TFA establishments, columns (3) through (6) for other establishments, and the last three columns compare the two groups.

Across domestic TFA enterprises, the mean number of employees fell slightly, from an average of 95 employees per plant to an average of 90 employees per plant. Columns (2) and (3) show that TFA employment growth was concentrated in foreign-owned and exporting enterprises. Between 1990 and 1996, foreign-owned and exporting plants added nearly 400 production workers on average. In contrast, establishments in other sectors grew very little. Columns (7) through (9) report the difference-in-difference, which is the difference in the change in employment across TFA and non-TFA firms between 1990 and 1996. Focusing on rows (3) and (4) and columns (8) and (9), we see that exporting and foreign-owned TFA plants increased employment by 300 to 400 workers more than other plants. The results in Table 6 suggest that anti-sweatshop activism vis-à-vis TFA enterprises did not appear to hurt their employment, at least relative to growth in employment of other types of enterprises. Trends in aggregate employment for TFA and non-TFA firms confirm this. In Figure 7, we show trends in total production worker employment in Indonesia during the sample period. Employment growth for the TFA sector clearly mirrors the rest of the manufacturing sector; in fact, employment growth was more robust from 1990 to 1996.

Table 7 repeats the analysis in a regression context. We replace the log of production worker wages with the log of production worker employment as the dependent variable. The coefficients on FOR*TREATMENT and EXP*TREATMENT are positive and sometimes significant. With or without controls, the results are consistent across specifications. There is no evidence that either treatment is

associated with employment declines. In fact, employment growth was generally higher for TFA exporters and foreign-owned enterprise, including those operating in districts where anti-sweatshop activists targeted Nike, Reebok, and Adidas.

However, the results in Table 7 show a robust and negative impact of the minimum wage increase on employment growth. In column (3), the coefficient on the minimum wage increase is $-.123$, which suggests that a 100 percentage point increase in the minimum wage would be accompanied by a 12.3 percentage point decline in employment. In our sample, the mean increase in the minimum wage measure was 50 percent, indicating an employment loss of 6 percent. The different specifications presented in columns (3) through (9) suggest that a 100 percentage point increase in the real minimum wage would be accompanied by employment declines of 12 to 36 percent. The significant negative impact on employment needs to be seriously considered in any campaign to increase the mandated minimum wage or to increase compliance with the minimum wage.¹⁸

Other Outcomes: Output Growth, Investment, Productivity, Profits, and Exit

The evidence in Tables 1 through 7 points to strong positive effects of anti-sweatshop campaigns on wage growth for production workers and insignificant effects on employment. We would, however, expect other outcomes to be adversely affected. Table 8 reports the impact of treatment on output growth, investment, productivity, and profits. Consistent with the insignificant effects on employment, the first two columns of Table 8 show that output growth for the two treatment groups was not significantly different than for other enterprises. However, profits were significantly and negatively affected. Growth in profitability for foreign-owned TFA firms in the treatment districts was 14 to 16 percentage points (of value-added) lower than for other similar plants. Lower growth in profits appeared to be linked to lower growth in capital stock and lower productivity growth, at least for foreign-owned TFA plants in treatment districts.

¹⁸ Indonesia, however, is an unusual case: most countries do not experience 100 percent real increases in the value of the minimum wage over a five year period.

In Table 9 we explore whether the pressures imposed by anti-sweatshop activists induced more firms to shut down operations. We estimate the probability of exit in period $t+1$ as a function of plant and worker characteristics in period t , using annual data. If the pressures imposed by anti-sweatshop activities led to higher exit or relocation abroad, then the benefits of higher wages could be offset by a higher probability of job loss. We begin with the whole sample, with results from a probit estimation of the likelihood of exit reported in column (1) of Table 9. If the treatment is defined as belonging to the TFA sector, there is no evidence that exporters or foreign-owned firms are more likely to shut down. In fact, foreign-owned plants in general are less likely to exit, as indicated by the significant and negative coefficient of $-.01$ in the first row and column of Table 9.

Bernard and Sjöholm (2004) point out that not taking into account the size of a plant is misleading, because small plants are much more likely to exit than large plants. In particular, they point out that in the Indonesian data, plants with less than 20 workers were eliminated from the sample after 1989, changing the composition of the sample in favor of larger plants, which are less likely to exit. One possibility is that exporters and foreign-owned plants in the TFA sector are less likely to exit because they are significantly larger than other plants. To address this possibility, in column (2) we only include plants with at least 100 workers. The coefficients are unaffected; foreign-owned enterprises in the treatment group were significantly less likely to exit during the sample period. Minimum wages have about the same impact as before, raising exit probabilities significantly.

In columns (3), (4), and (5) we restrict the analysis to TFA plants and define TREATMENT as operating in districts with Nike, Reebok, and Adidas contractors. Columns (3) and (4) show that foreign-owned plants located in the treatment districts are also less likely to exit: 2 percent less likely than other plants. These lower probabilities of exit for foreign-owned enterprises are consistent with the unconditional exit probabilities depicted in Figure 8. However, higher minimum wages did increase the probability of exit, with a 10 percent increase in the real minimum wage leading to a higher probability of plant exit by .6 to 1.1 percent.

Interestingly, our results are somewhat different from Bernard and Sjöholm (2004), who find that foreign-owned plants in Indonesia are more footloose than other plants. Our results suggest that foreign-owned plants are *less* footloose. This could be because the number of foreign-owned enterprises in Indonesia in the 1980s—Bernard and Sjöholm examine data which ends in 1989—was small and consequently a few plants could lead to large rates of entry and exit. Our data focuses on the 1990s, when there were many more foreign-owned plants in Indonesia.

In column (5) we turn to an analysis of plants with less than 100 employees. Small TFA exporters in treatment districts are 4.5 percentage points more likely to exit than other small TFA exporters. These results are statistically significant and suggest that TREATMENT is associated with a higher probability of plant shutdown for small exporters. The next 6 columns (columns 6-11) exclude controls for worker characteristics and minimum wages. Since worker characteristics are only recorded for three years in the 1990s, including worker characteristics restricts the sample to surviving plants or plants exiting after 1995, when worker characteristics were first recorded. In this larger sample, the evidence is consistent with lower probability of exit for foreign-owned enterprises, including both TFA and non-TFA foreign plants.

However, the evidence is consistent with higher exit probabilities for small TFA exporters in the treatment group, as indicated in columns (5) and (11). While exporters in general were less likely to exit, small TFA exporters operating in the treatment districts were significantly more likely to exit than other small TFA exporters, with a 15.5 percent higher probability of exiting compared to other enterprises. This significantly higher probability of exit is consistent with the unconditional exit probabilities depicted in Figure 8.

One possibility is that TFA exporters are simply more volatile, exhibiting higher rates of entry as well. Figure 9 shows that this is not the case. During the 1990s, not only were TFA plants more likely to exit, but entry rates also dropped as well. As indicated in Figure 9, higher rates of entry by TFA plants relative to other sectors were followed by a fall in entry rates, which by the end of the 1990s were

comparable to non-TFA plants. Other probit regressions (not shown) confirm that there was less entry into the TFA sector, particularly among exporters.

If entry fell and exit rates rose for exporting TFA plants, how can we account for the fact that total employment in TFA plants did not fall? In other words, how can we explain that TFA production worker employment as a percentage of total manufacturing employment increased at the same time that exit became proportionately higher? The reason, as shown in Table 6, is that remaining TFA plants—particularly exporters and foreign-owned plants—increased production worker employment by as much as 50 percent. Employment increases within surviving plants compensated for higher exit by some TFA enterprises.

Does Better Compliance with Minimum Wage Laws Explain the Observed Wage Gains?

An important question remains: were the wage increases in treatment firms simply a result of better compliance with the rising minimum wage? We address this question in Table 10. The first three columns report the change in compliance with the statutory minimum wage as a function of treatment, controlling for plant and worker characteristics. The dependent variable is the change in compliance between 1990 and 1996, where compliance is a dummy variable equal to 1 if the firm's average production worker wage exceeded the statutory minimum wage in that district. The results in column (1) show that if treatment is defined as the TFA sector, then foreign or exporting treatment firms increased compliance with the minimum wage by 15.1 percentage points relative to the control (firms in other sectors). If treatment is defined as operating in districts targeted by anti-sweatshop activism, then the results in columns (2) and (3) indicate that TREATMENT led to increased compliance by 12.4 to 37.1 percent relative to other TFA firms. The first three columns of Table 10 suggest that the anti-sweatshop movement was associated with a large and significant increase in compliance with the minimum wage.

The next four columns of Table 10 measure the contribution of higher minimum wage compliance to the wage increases associated with treatment. To do this, we add a triple interaction term between foreign-ownership or export status FOREXP, TREATMENT, and the minimum wage gap. If activism led to higher wages by increasing compliance with the minimum wage, then this interaction term

should capture that effect and the coefficient on $\text{FOREXP} \times \text{TREATMENT}$ should become small in magnitude and insignificant. The results presented in columns (4) through (7) show that this is indeed the case.

The coefficient on $\text{FOREXP} \times \text{TREATMENT}$ becomes insignificant and close to zero, while the coefficient on the triple interaction is large in magnitude and significant. These results suggest that anti-sweatshop activism led to higher wages primarily by increasing compliance with the minimum wage. In columns (8) and (9) we add the triple interaction to the employment regressions from Table 7. The inclusion of the additional term does not affect the results, suggesting that while anti-sweatshop activism was associated with additional wage growth it was not associated with greater employment declines, or with falling employment stemming from more vigilant compliance with the minimum wage. While on average the large minimum wage increases were associated with falling employment, the increasing compliance of establishments targeted by anti-sweatshop activism was not. Combining the results presented in Tables 7 through 10 suggests that plants targeted by the campaigns either raised wages, cut profits, and maintained employment, or simply exited the industry.

V. Conclusion

During the 1990s, anti-sweatshop activists increased their efforts to improve working conditions and raise wages for workers in developing countries. Indonesia, which had more Nike contractors than any other country apart from China during this period, was a primary target for these activists. The Indonesian government also greatly increased the minimum wage throughout Indonesia during the 1990s. This paper analyzes the impact of these twin interventions on labor market outcomes in Indonesian manufacturing. The results suggest that on top of the large wage increases induced by minimum wage changes, real production worker wages rose an additional 10 to 20 percent for TFA relative to non-TFA establishments. Within the TFA sector, treatment plants experienced even larger real wage increases. Large TFA establishments in treatment districts increased production worker wages by as much as 30 percent relative to other plants. As we show in the paper, much of the wage increases within targeted

plants reflected higher compliance with the minimum wage relative to non-TFA or non-treatment plants after the onset of the anti-sweatshop campaigns.

One question which naturally arises is how such large real wage increases could be sustained without adverse consequences for employment.¹⁹ We examine whether these higher wages led firms to cut employment or shut down operations. Our results suggest that the minimum wage increases led to employment losses for production workers across all sectors in manufacturing. While anti-sweatshop activism did not have additional adverse effects on employment within the TFA sector, it did lead to falling profits, reduced productivity growth, and plant closures for smaller exporters.

It is important to note that the wage gains documented in this paper could be temporary. In the late 1980s and early 1990s, the TFA sector in Indonesia was booming as suppliers from higher cost East Asian locations shifted operations to lower cost locations nearby. Yet in the last ten years, footwear and apparel companies such as Nike have shifted to vendors in other low-wage countries, including China, Vietnam, and Cambodia. Vietnam has now replaced Indonesia as the second largest vendor location (after China), as measured by the number of workers employed in Nike supplier factories. While Nike continues to use Indonesian contract factories to source 20 percent of its footwear operations, this share will continue to fall if factories in Vietnam produce lower cost and higher quality goods.

Many research and policy questions remain unanswered. Designing anti-sweatshop campaigns in such a way as to make wage gains and better factory conditions sustainable, without endangering employment or leading plants to relocate elsewhere, is challenging. The new anti-sweatshop activism emphasizes the introduction of “living wages”, which are significantly harder to define and consequently to implement compared to codes of conduct focused on compliance with minimum wages. Extending the type of analysis presented in this paper to other countries would also be informative.

¹⁹ It is important to keep in mind that for a well-known brand name such as Nike, labor costs from developing country factories in 1998 only accounted for about 4 percent of the total cost of a ninety dollar shoe. The internet link is <http://cbae.nmsu.edu/~dboje/NIKfaqcompensation.html>. This interview with Nike is from 1998, but is no longer part of Nike’s “official” website.

Wages in Indonesian TFA factories were very low prior to the onset of the anti-sweatshop campaigns; vendors for Nike were able to implement significant wage increases before even approaching the average wages across the Indonesian manufacturing sector. Another key consideration is that many of the goods produced in Indonesia's TFA sectors ultimately end up in expensive retail markets in the U.S. and the EU, where profit margins are relatively large, brand identity is paramount, and the firms clearly have the financial resources to improve labor conditions in their factories.²⁰ In industries where more firms compete for market share, profit margins are smaller, and there is no brand recognition, anti-sweatshop campaigns may not be as effective.

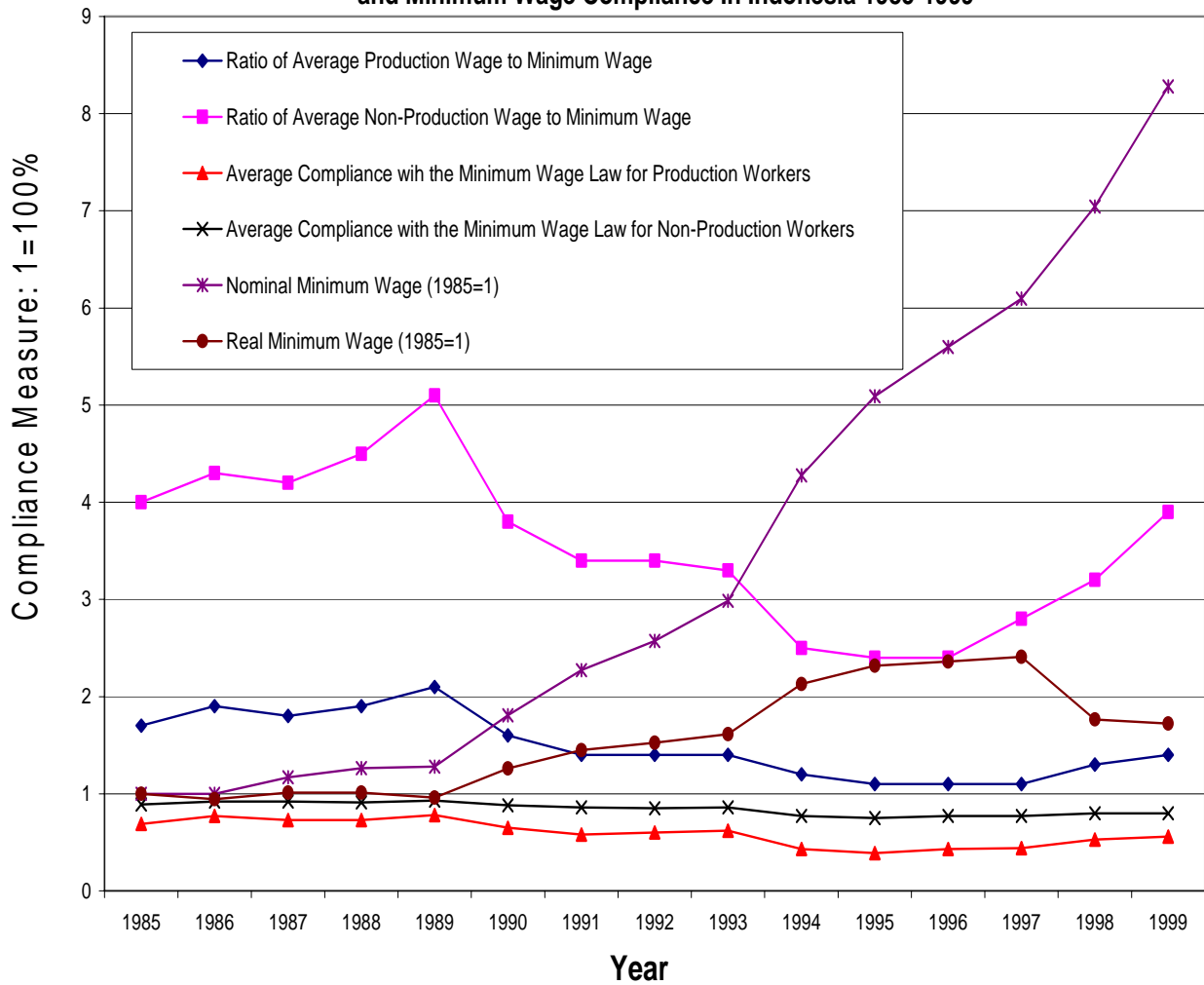
²⁰ One only needs to witness the many millions of dollars Nike has spent on trying to improve worker conditions as well as the money it has spent on public relations campaigns to improve its image. Nike employs 85 people full-time to maintain Nike's compliance with environmental and labor standards in the countries where Nike operates and Nike workers inspect apparel and footwear factories on a daily or weekly basis (Locke 2003).

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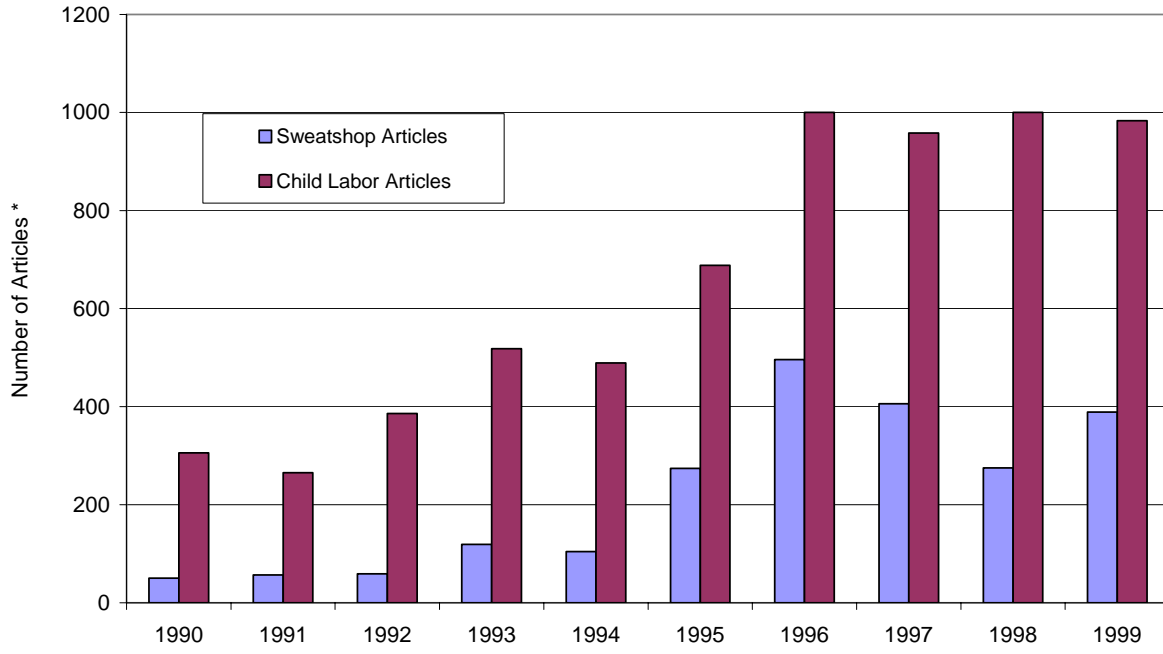
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Figure 1: Average Wages with Respect to the Minimum Wage and Minimum Wage Compliance In Indonesia 1985-1999



Notes: For Figure 1 we used the manufacturing census data to calculate average production and non-production worker wages relative to the statutory minimum. Compliance is based on comparing the average wage in the plant, defined as production worker compensation divided by number of production workers, to the statutory minimum wage in that district and year. The definition is the same for non-production workers. Compliance is set to unity if the average establishment wage exceeds the minimum wage, and zero otherwise. For each year, we then report the percentage of firms complying with the minimum wage. A value of 1 indicates 100 percent.

**Figure 2: Articles about "Sweatshops" and "Child Labor"
Major U.S. and World Publications 1990-1999**



Source: LexisNexis
*Maximum Articles Displayed=1000

**Figure 3: Share of Articles on Sweatshops or Child Labor in Indonesia Relative to all Other
Articles on the Indonesian Economy in the NYT
3 Period Moving Average (Source: LexisNexis)**

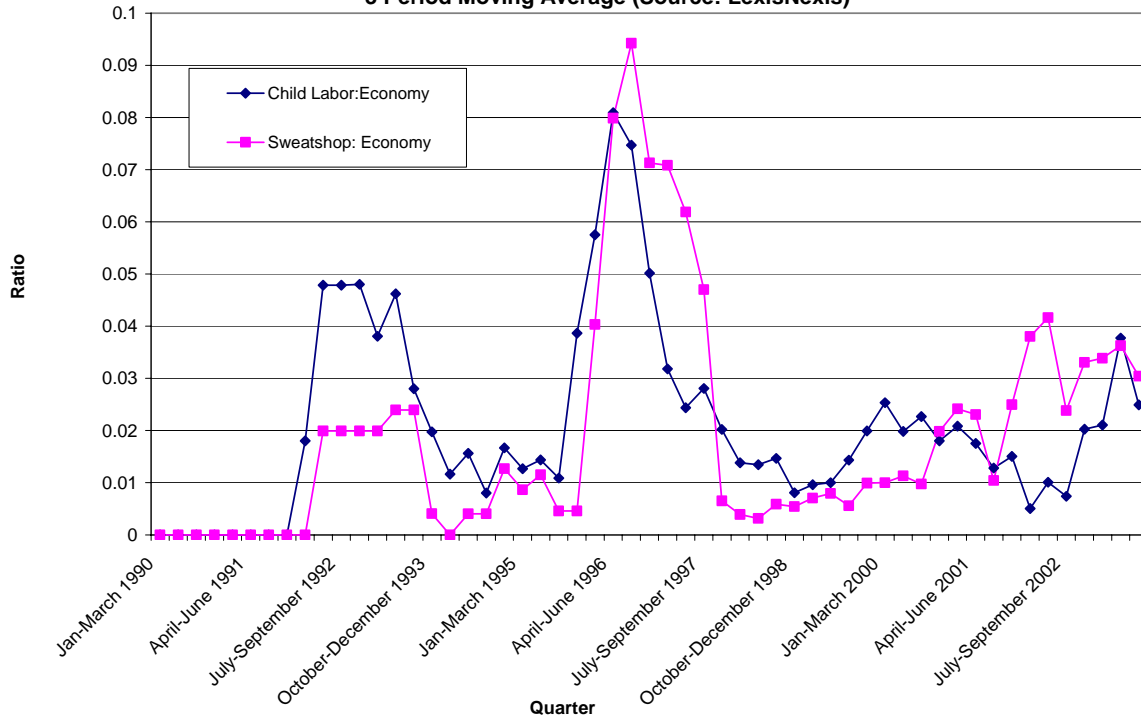


Figure 4

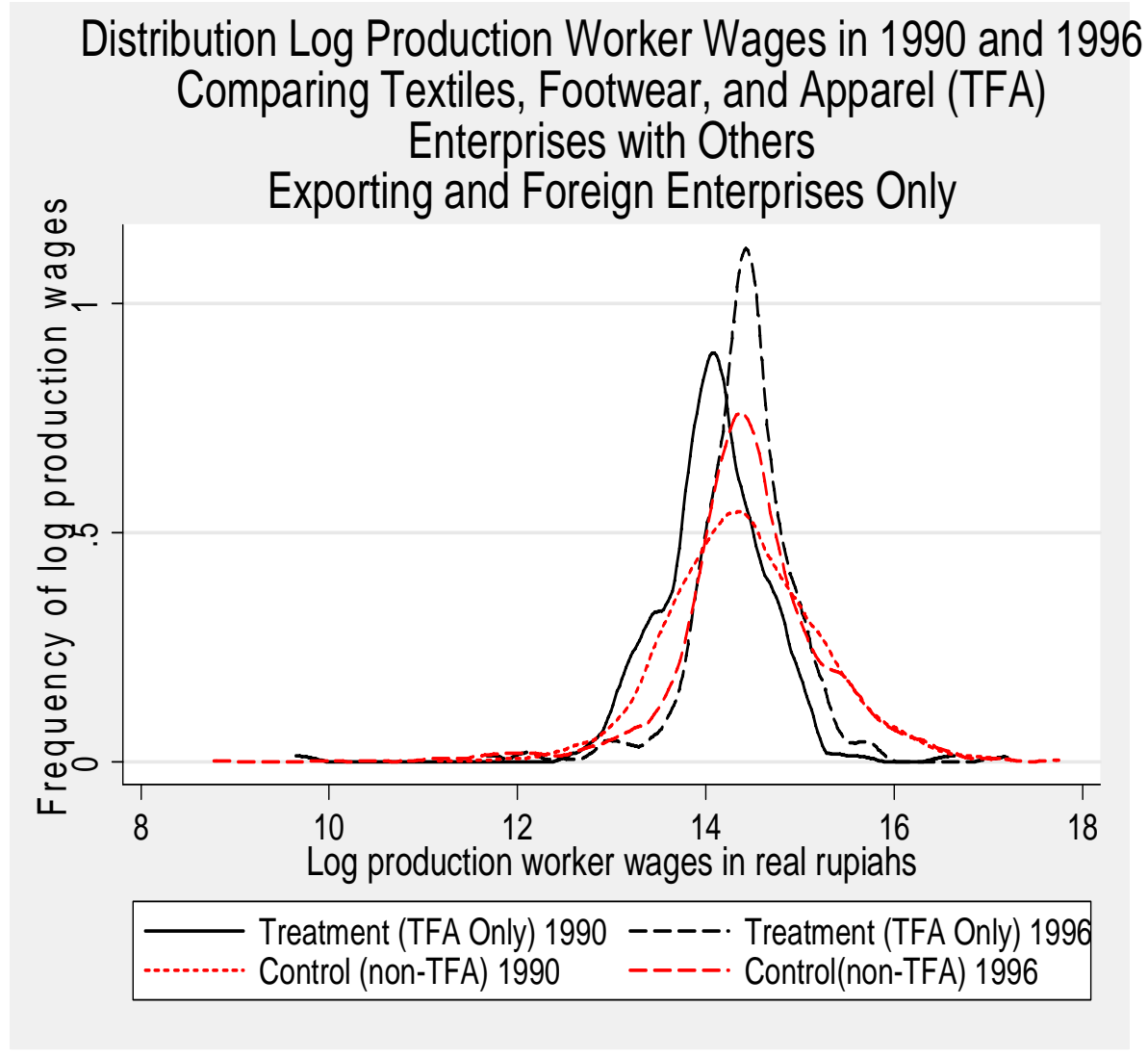


Figure 5

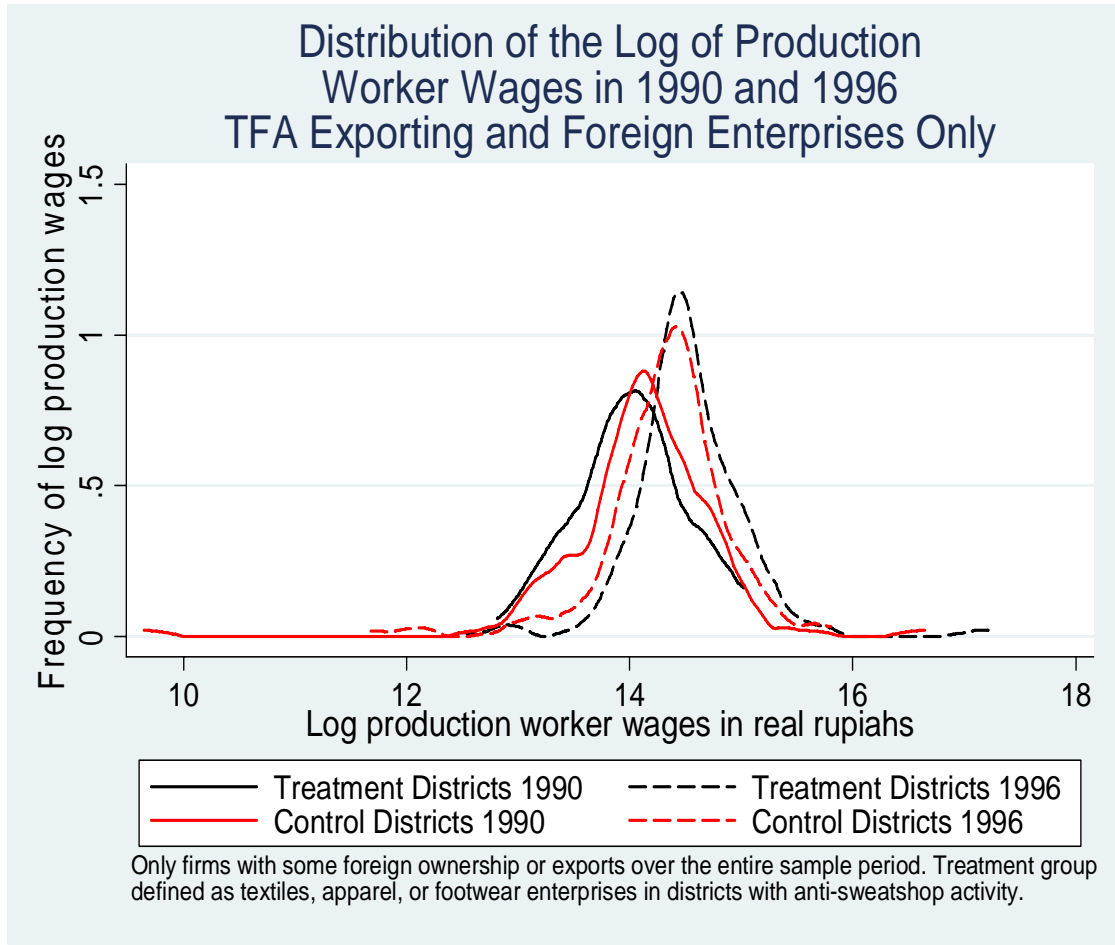
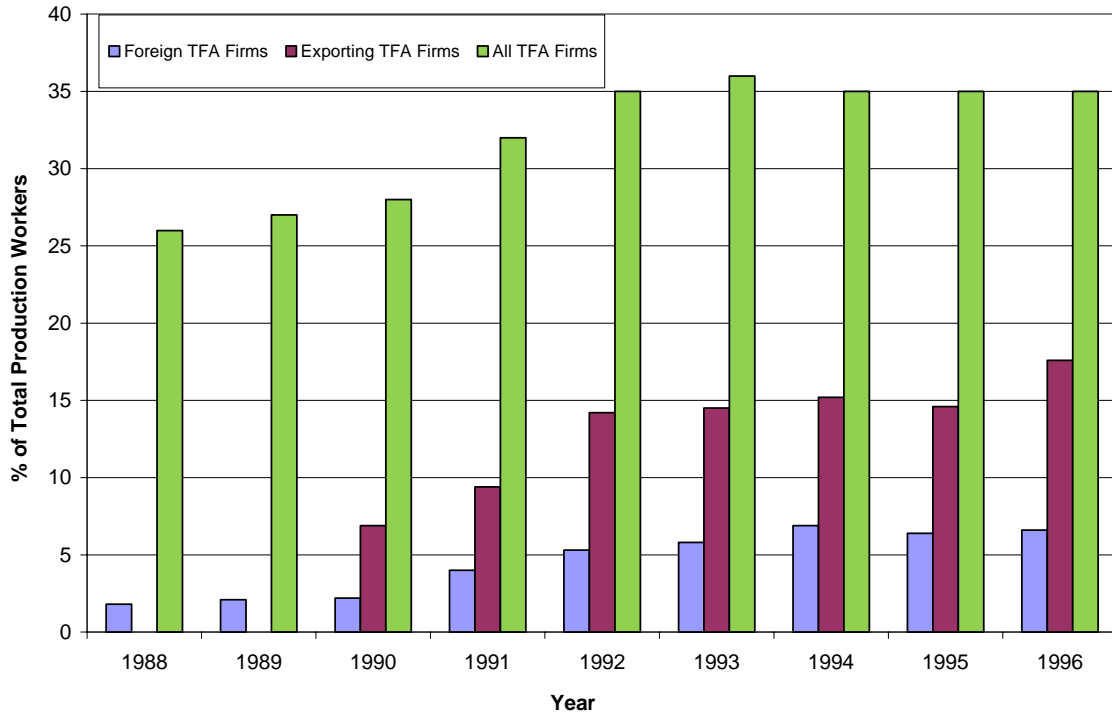


Figure 6: Share of Total Production Workers Employed in Foreign and Exporting TFA in Indonesia 1988-1996



**Figure 7: Total Production Worker Employment 1988-1999
(Foreign and Exporting Firms)**

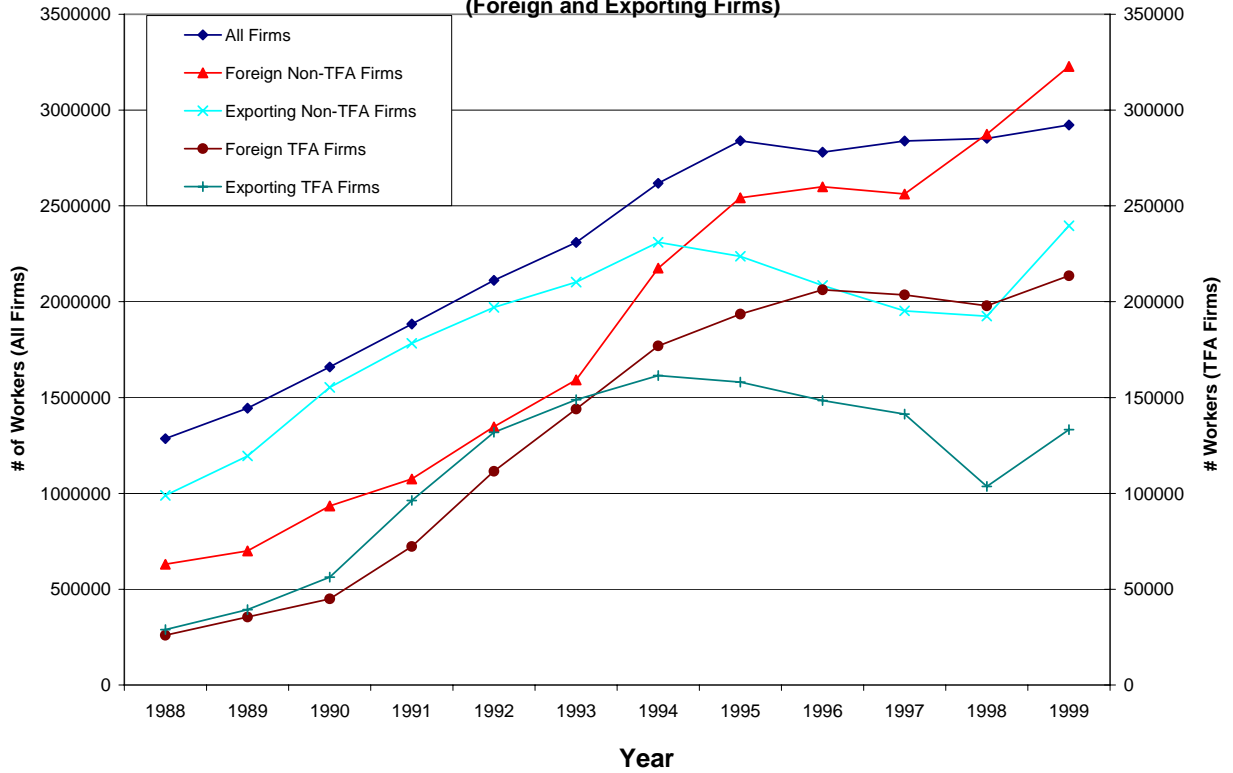


Figure 8: Percentage of Firms Exiting in Years 1988-1999

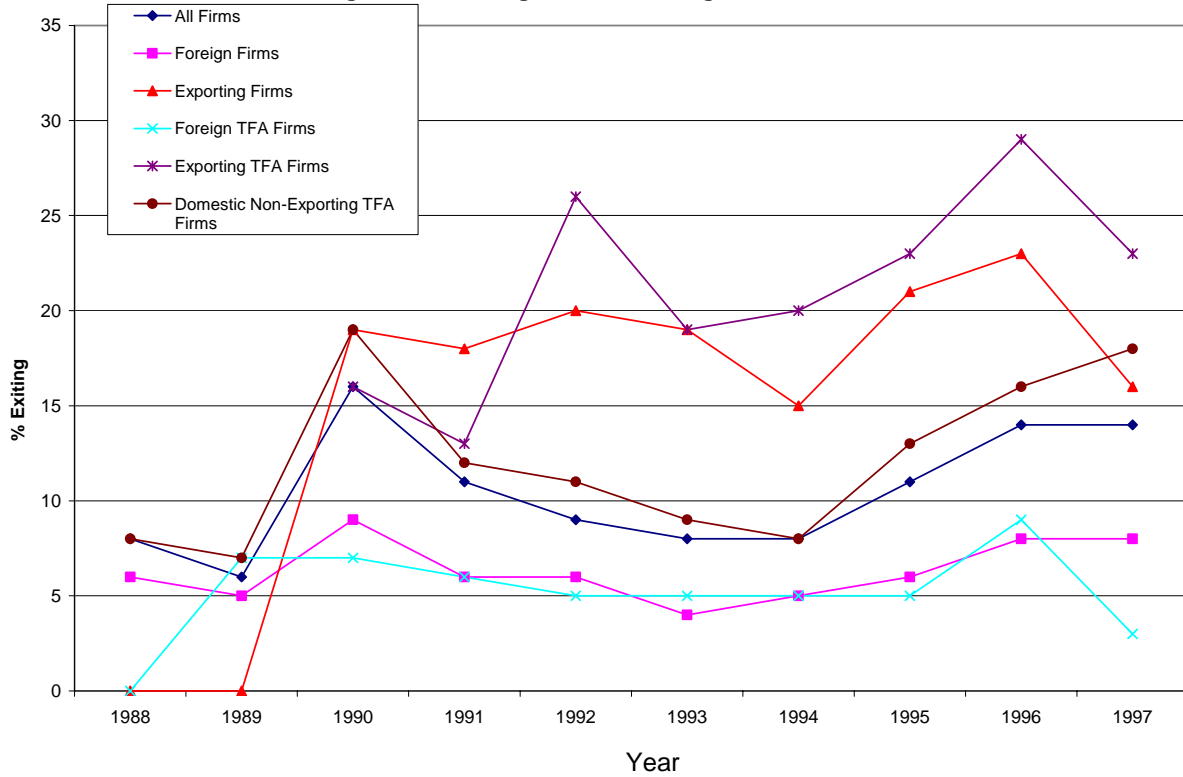
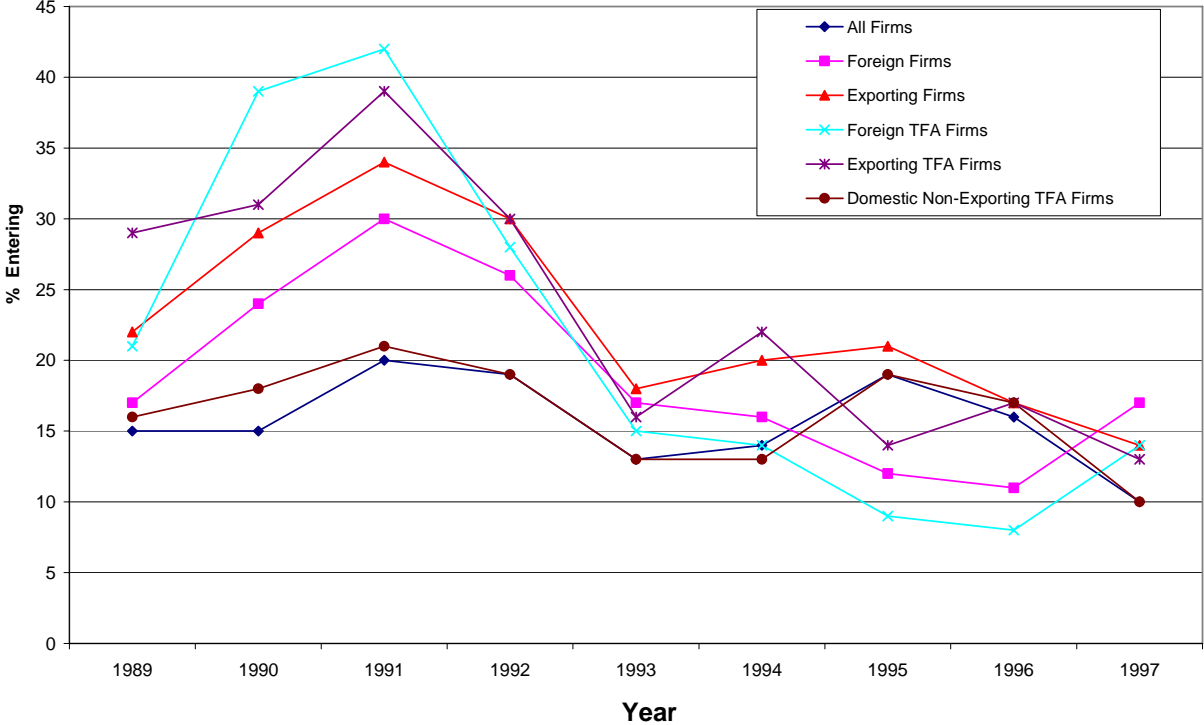


Figure 9: Percentage of Firms Entering In Years 1989-1997



**Table 1A: Mean Production Worker Wages in 1990 and 1996
Contrasting Textiles, Footwear, and Apparel (TFA) versus Other Sectors**

	Textiles, Footwear, and Apparel			Other Establishments			Difference		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Domestic ^a	Always Foreign ^b	Always Exporting ^c	Domestic ^a	Always Foreign ^b	Always Exporting ^c	(1)-(4)	(2)-(5)	(3)-(6)
1. Mean Wage in 1990, All Observations	1078.2 (15.5)	1775.1 (112.1)	1462.4 (122.8)	1134.2 (13.2)	3560.8 (182.1)	1934.6 (102.7)	56.0 (27.9)	-1805.6 (419.1)	-472.2 (205.2)
2. Mean Wage in 1996, All Observations	1441.2 (19.6)	2268.8 (79.2)	2079.2 (100.0)	1552.4 (14.4)	3798.6 (137.8)	2125.2 (54.6)	-111.1 (32.1)	-1529.7 (280.0)	-46.0 (115.6)
3. Change in Mean Wage, 1990-1996	363.0 (25.7)	513.7 (151.2)	616.8 (187.1)	418.1 (20.2)	237.8 (241.1)	190.6 (111.2)	-54.9 (36.7)	275.9 (497.6)	426.2 (188.5)
4. Change in Mean Wage, Balanced Sample ^d	349.4 (33.4)	740.1 (196.3)	474.2 (170.0)	374.7 (26.6)	814.9 (318.8)	259.4 (135.2)	-25.3 (47.4)	-74.8 (497.6)	214.8 (188.5)
5. Mean Change in Log Wage, 1990-1996	.30 (.03)	.29 (.09)	.40 (.05)	.37 (.01)	.08 (.05)	.13 (.04)	-.07 (.02)	.21 (.11)	.27 (.07)
6. Mean Change in Log Wage, Balanced Sample	.30 (.03)	.36 (.10)	.35 (.06)	.28 (.02)	.22 (.07)	.16 (.05)	.02 (.02)	.14 (.10)	.19 (.10)

Notes:

Standard Errors in parentheses

Definitions:

(a) A plant that is neither foreign-owned nor exports the entire period.

(b) Includes at least 10% foreign equity over the entire period.

(c) Exports at least 10% of output over the entire period.

(d) Defined as establishments present in both 1990 and 1996.

Table 1B
Comparison of Treatment Groups relative to Controls Prior to Treatment (1988-1990)

Results of T-test difference in Means for the Control relative to Treatment for the Following Variables:	Treatment is Textiles, Footwear and Apparel (TFA) Exporting or Foreign Enterprises Relative to Other Sectors						Treatment is TFA Enterprises in Treatment Regions versus other TFA Enterprises					
	Foreign-Owned Enterprises			Exporters			Foreign-Owned Enterprises			Exporters		
	Treatment	Control	T-test of Difference	Treatment	Control	T-test of Difference	Treatment	Control	T-test of Difference	Treatment	Control	T-test of Difference
Average Production Worker Wages ('000s of Real Rupiahs per worker)	2029 (124.9)	3847 (127.8)	5.76**	1656 (92.49)	2618 (66.64)	6.51**	1577 (106.6)	2381 (194.9)	3.35**	1371 (62.9)	1813 (137.9)	2.30*
Size (Total number of employees)	975.7 (80.33)	374.1 (20.39)	-10.1**	616.5 (38.11)	442.3 (15.67)	-4.61**	810.9 (128.4)	1104.2 (99.9)	-1.83	683.9 (67.6)	579.6 (45.8)	-1.31
Profits (Value-added less payments to workers as a share of Value-added)	0.343 (.019)	0.349 (.009)	0.26	0.364 (.011)	0.348 (.005)	-1.22	0.345 (.035)	0.342 (.020)	-0.07	0.338 (.014)	0.378 (.014)	-0.07
Log change in Production Worker Wages	0.061 (.076)	-0.004 (.026)	-0.88	0.079 (.035)	0.033 (.016)	-1.16	-0.024 (.073)	0.108 (.112)	0.83	0.080 (.051)	0.078 (.046)	-0.02
Log change in number of production workers	0.065 (.023)	0.072 (.018)	0.15	0.136 (.023)	0.117 (.013)	-0.63	0.105 (.056)	0.042 (.018)	-1.32	0.109 (.040)	0.148 (.029)	0.77
Log change in material inputs	0.080 (.069)	0.141 (.035)	0.65	0.212 (.061)	0.144 (.025)	-1.09	0.145 (.115)	0.043 (.086)	-0.709	0.231 (.088)	0.203 (.079)	-0.211
Log change in capital stock	0.255 (.205)	0.245 (.071)	-0.05	0.142 (.097)	0.272 (.044)	1.24	-0.015 (.579)	0.373 (.164)	0.867	-0.065 (.203)	0.223 (.108)	1.344
Total Factor Productivity Growth	0.038 (.056)	0.063 (.025)	0.36	0.005 (.040)	0.052 (.015)	1.25	0.084 (.072)	0.018 (.076)	-0.52	0.012 (.032)	0.003 (.055)	-0.10
Output Growth	0.097 (.061)	0.123 (.026)	0.36	0.229 (.049)	0.146 (.021)	-1.65	0.215 (.106)	0.032 (.072)	-1.46	0.279 (.073)	0.207 (.063)	-0.68

Standard errors in parentheses. A * indicates the difference in means is statistically significant at the 5 percent level; a ** indicates the difference in means is statistically significant at the 1 percent level. Values calculated for the 1988 through 1990 period, except for total factor productivity growth (TFPG) and capital stock where we use 1988 and 1989 only. All values in real Rupiahs are deflated by the CPI, based in 1996. Productivity growth is defined as the log change in output less the weighted changes in inputs, where inputs include production and non production workers, materials, and capital stock. The weights are equal to an average of the shares of each of the inputs in total costs in the current and last period, except capital which is equal to 1 less other input shares.

Table 2
OLS Long Difference-in-Differences Estimation: Regressing Production Worker Wage Differences for 1990-1996 on the Minimum Wage Gap, Plant Characteristics, and Other Controls

(Treatment is Establishments in Textiles, Footwear, and Apparel Sectors)

Dependent Variable: Log Plant Unskilled Wage in 1996 – Log Plant Unskilled Wage in 1990

	(1) Ownership Dummies Only	(2) Adding plant, worker, and region controls	(3) Combining Foreign and Exporting Enterprises	(4) Same as (3) but excluding Textiles as Treatment	(5) Excluding Minimum Wage as a Control and excluding Textiles	(6) Dependent variable is non-wage benefits for production workers	(7) Dependent Variable is wages plus non-wage Benefits, All Controls	(8) Dependent Variable is log wages for non- production workers
Foreign (a)	0.094 (1.87)	0.061 (0.97)	--	--	--	--	--	--
Exporter (b)	-0.057 (1.35)	-0.052 (0.98)	--	--	--	--	--	--
Foreign or Exporter (FOREXP)	--	--	0.010 (0.32)	-0.001 (0.03)	-0.097 (3.85)**	-0.006 (0.43)	0.010 (0.33)	-0.036 (0.97)
TREATMENT (c)	-0.059 (1.57)	-0.039 (1.99)	-0.049 (2.12)*	-0.037 (1.76)	-0.031 (0.98)	0.002 (0.29)	-0.049 (2.19)*	0.045 (1.72)
Foreign* TREATMENT	0.106 (2.25)*	0.124 (3.18)**	--	--	--	--	--	--
Exporting* TREATMENT	0.119 (2.30)*	0.110 (2.21)*	--	--	--	--	--	--
FOREXP* TREATMENT	--	--	0.097 (2.43)*	0.102 (2.92)**	0.202 (5.67)**	-0.034 (0.77)	0.096 (2.41)*	-0.057 (1.13)
Minimum Wage (d)	0.554 (9.79)**	0.675 (7.53)**	0.667 (7.41)**	0.669 (7.30)**	--	-0.023 (1.11)	0.667 (7.42)**	0.150 (3.42)**
Observations	6165	5920	5920	5920	5920	5335	5920	5099
R-squared	0.12	0.23	0.23	0.23	0.13	0.03	0.23	0.07

Robust t statistics in parentheses, with * indicating significance at 5 % and ** indicating significance at 1 %. Constant term included in all specifications but not reported here.
Notes:

(a) Includes some foreign equity over the entire period.

(b) Exports some share of output over the entire period.

(c) TREATMENT is defined as an establishment in the textiles, footwear, or apparel (TFA) sector

(d) Defined as the log of the minimum wage in 1996 less the log of the minimum wage in 1990, unless the plant pays above the 1996 minimum wage in 1990, in which case the minimum wage change is set equal to zero.

Table 3

**OLS Long Difference-in-Differences Estimation: Regressing Production Worker Wage Differences for 1990-1996 on the Minimum Wage Gap, Plant Characteristics, and Other Controls
Textiles, Footwear and Apparel Only**

Treatment is Establishments in Districts with Nike, Reebok, and Adidas Contractors

Dependent Variable: Log Plant Unskilled Wage in 1996 – Log Plant Unskilled Wage in 1990	(1) All Firms	(2) Large Firms (At Least 100 Employees)	(3) Small Firms (Less than 100 Employees)	(4) Large Firms Apparel and Footwear Only	(5) Small Firms Apparel and Footwear Only	(6) Large Firms Apparel and Footwear Including Minimum Wages	(7) Small Firms Apparel and Footwear Including Minimum Wages
Foreign or Exporter (FOREXP) (a)	-0.071 (1.04)	-0.152 (2.30)*	0.098 (1.25)	-0.346 (2.10)	0.091 (0.99)	-0.282 (-2.04)	0.071 (0.65)
TREATMENT (b)	0.024 (0.36)	-0.014 (0.16)	0.051 (1.64)	-0.218 (3.37)*	0.088 (1.24)	-0.182 (2.86)*	0.061 (1.00)
FOREXP*TREATMENT	0.216 (1.78)	0.295 (2.36)*	-0.209 (2.65)*	0.518 (2.49)*	-0.070 (0.64)	0.434 (2.68)*	-0.165 (1.33)
Minimum Wage (c)	-	--	--	--	--	1.001 (7.31)**	0.686 (3.01)*
Observations	1123	535	588	214	286	214	286
R-squared	0.20	0.17	0.32	0.20	0.31	0.36	0.39

Robust t statistics in parentheses, with * indicating significance at 5 % and ** indicating significance at 1 %. Constant term included in all specifications but not reported here.

Notes:

(a) Includes some foreign equity over the entire period or exports some share of output over the entire period.

(b) An establishment in the textiles, footwear, and apparel (TFA) sector in a district where Nike/Reebok/Adidas contractors operate

(c) The minimum wage is defined as the log of the minimum wage in 1996 less the log of the minimum wage in 1990, unless the plant pays above the 1996 minimum wage in 1990, in which case the minimum wage change is set equal to zero.

Table 4
Robustness Tests

Dependent Variable: Log Plant Unskilled Wage in 1996 – Log Plant Unskilled Wage in 1990

	(1) All Firms: Adding log skilled workers	(2) Large FA Firms: Adding log skilled workers	(3) All Firms: Adding dummy variable for low initial wages	(4) Large FA Firms: Adding dummy variable for low initial wages	(5) All Firms: Adding profit margins	(6) Large FA Firms: Adding profit margins
Foreign or Exporter (a) FOREXP	0.010 (0.34)	-0.281 (2.08)	0.027 (0.89)	-0.282 (2.03)	0.006 (0.19)	0.324 (2.14)
TREATMENT (b)	-0.047 (2.05)*	-0.183 (2.88)*	-0.048 (1.81)	-0.184 (2.99)*	-0.055 (2.21)*	-0.207 (2.96)*
FOREXP*TREATMENT	0.093 (2.24)*	0.432 (2.69)*	0.089 (2.38)*	0.439 (2.71)*	0.101 (2.75)*	0.478 (2.75)*
Minimum Wage (c)	0.663 (7.44)**	0.994 (7.68)**	0.130 (1.05)	0.599 (1.90)	0.676 (7.52)**	0.979 (6.45)**
Log of skilled employees	0.055 (4.10)**	0.021 (0.60)	-	-	-	-
Profit Margins (d)	-	-	-	-	0.121 (1.03)	-0.281 (1.02)
Dummy variable equal to 1 the firm paid below the 1996 minimum wage in 1990	-	-	0.426 (4.53)**	0.312 (0.91)	-	-
Observations	5920	214	5920	214	5673	199
R-squared	0.23	0.36	0.24	0.36	0.23	0.37

Robust t statistics in parentheses, with * indicating significance at 5 % and ** indicating significance at 1 %. Large firms defined as those with at least 100 employees. Small firms are those with less than 100 employees.

Notes:

(a) Includes some foreign equity over the entire period or exports some share of output over the entire period.

(b) In columns (1), (3), and (5) TREATMENT is defined as an establishment in the textiles, footwear, and apparel (TFA) sector. In the other columns, treatment is defined as locating in a district where Nike, Adidas or Reebok contractors operate.

(c) Defined as the log of the minimum wage in 1996 less the log of the minimum wage in 1990, unless the plant pays above the 1996 minimum wage in 1990, in which case the minimum wage change is set equal to zero.

(d) Defined as in Table 1B: profits are equal to (value-added less payments to workers)/value-added

Table 5
Additional Tests of Robustness: Substituting Different Treatment Groups and Matching Estimators

Dependent Variable: Log Plant Unskilled Wage in 1996 – Log Plant Unskilled Wage in 1990

Industry (ISIC Classification)	Tests of Robustness: Switching from Textiles, Footwear, and Apparel to Other Industrial Sectors Treatment is defined as Locating in a particular sector Large Enterprises Only			Estimating Treatment Effect Using Matching Estimators for Treatment Treatment defined as locating in districts with Nike, Reebok, or Adidas contractors Large enterprises only
	Foreign or Exporter (FOREXP)	TREATMENT	TREATMENT* FOREXP	Coefficient on TREATMENT*FOREXP
TFA Only	-0.152 (2.30)*	-0.014 (0.16)	0.295 (2.36)*	0.198 (2.19)*
Food, Beverages, And Tobacco	-0.256 (1.19)	0.350 (3.45)**	0.274 (1.18)	0.160 (0.52)
Wood and furniture	-0.111 (1.40)	0.287 (2.80)**	-0.344 (2.81)**	-0.175 (0.78)
Paper Products	0.097 (0.51)	-0.209 (1.03)	0.108 (0.83)	-0.059 (0.19)
Chemicals and Petroleum Products	-0.093 (1.30)	0.140 (2.11)*	-0.087 (1.11)	0.002 (0.02)
Non-metallic mineral Products	0.135 (0.36)	0.239 (0.75)	-0.341 (0.52)	0.060 (0.20)
Basic Metal Industries	-0.066 (0.50)	0.441 (1.61)	0.375 (1.17)	-0.127 (0.34)
Fabricated metal Products and machinery	0.109 (2.26)*	-0.039 (2.23)*	-0.180 (5.06)**	-0.106 (0.83)
Other Manufacturing	0.542 (0.92)	0.472 (0.47)	-1.407 (3.06)*	-0.618 (2.96)**

Notes: First 3 columns have same specification as column (3) of Table 2, substituting different ISIC codes for TFA. For last column, see text.

Table 6: Average Production Worker Employment per Establishment in 1990 and 1996

	Textiles, Footwear, and Apparel Establishments			Other Establishments			Difference		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Domestic (a)	Always Foreign (b)	Always Exporting (c)	Domestic (a)	Always Foreign (b)	Always Exporting (c)	(1)-(4)	(2)-(5)	(3)-(6)
1. Mean Employment in 1990 All Available Observations	94.82 (5.53)	737.75 (97.87)	403.64 (45.99)	62.39 (1.60)	288.67 (24.43)	399.60 (24.71)	43.42 (4.24)	449.08 (70.26)	4.04 (52.75)
2. Mean Employment in 1996 All Available Observations	90.00 (4.74)	1126.97 (109.79)	765.97 (66.37)	61.60 (1.60)	353.50 (19.73)	297.14 (12.73)	28.40 (4.08)	773.47 (67.44)	468.82 (42.65)
3. Change in Mean Employment, 1990-1996	-4.82 (7.3)	389.22 (197.70)	362.33 (118.17)	-0.79 (2.31)	64.83 (33.99)	-102.46 (26.18)	-4.03 (4.23)	324.39 (70.5)	464.79 (52.9)
4. Change in Mean Employment Balanced Sample (d)	14.69 (15.51)	561.99 (237.76)	432.67 (143.82)	12.17 (4.09)	119.68 (54.88)	117.98 (49.59)	2.48 (5.3)	442.3 (91.5)	314.69 (60.0)
5. Change in Mean Log Employment, All Observations	.03 (.03)	.23 (.20)	.22 (.10)	-.02 (.01)	.19 (.08)	-.37 (.06)	.05 (.02)	.04 (.11)	.59 (.07)
6. Change in Mean Log Employment, Balanced Sample	.08 (.05)	.54 (.17)	.45 (.19)	.09 (.02)	.30 (.11)	.18 (.09)	-.01 (.02)	.24 (.16)	.12 (.12)

Notes: Standard errors in parentheses

(a) A plant that is neither foreign-owned nor exports the entire period

(b) Includes some foreign equity over the entire period.

(c) Exports some share of output over the entire period.

(d) Defined as establishments present in both 1990 and 1996.

(e) Average of annual changes in establishments present in both 1990 and 1996

Table 7
OLS Long Difference-in-Differences Estimation: Regressing Production Worker Employment Differences for 1990-1996 on the Minimum Wage Gap, Plant Characteristics, and Other Controls

Dependent Variable: Log Production Worker Employment in 1996 – Log Production Worker Employment in 1990

	Treatment Defined as Belonging to TFA Sector				Treatment defined as Operating in Treatment Districts, TFA Enterprises Only					
	(1) Ownership Dummies Only	(2) Ownership Dummies Only	(3) All Controls	(4) Treatment Excludes Textiles	(5) All TFA Firms	(6) No Minimum Wage as a control	(7) Large Firms Only	(8) Footwear and Apparel Firms Only	(9) FA Enterprises; Large Firms Only	(10) FA Enterprises, Large Firms Only
Foreign (a)	0.106 (3.50)**	--	--	--	--	--	--	--	--	--
Exporter (b)	0.067 (2.19)*	--	--	--	--	--	--	--	--	--
Foreign or Exporter	--	0.121 (4.37)**	0.019 (0.79)	0.024 (1.08)	0.044 (1.69)	0.074 (2.39)*	-0.012 (0.60)	0.077 (1.52)	0.086 (1.22)	0.113 (1.76)
TREATMENT (c)	-0.016 (0.51)	-0.015 (0.46)	0.002 (0.13)	0.032 (1.14)	0.006 (0.16)	0.011 (0.35)	-0.031 (0.94)	0.083 (3.07)*	0.044 (0.91)	0.059 (1.21)
Foreign*TREATMENT	0.104 (1.07)	--	--	--	--	--	--	--	--	--
Exporting*TREATMENT	0.106 (0.70)	--	--	--	--	--	--	--	--	--
FOREXP*TREATMENT	--	0.104 (0.92)	0.098 (1.88)	0.104 (1.35)	0.156 (2.87)**	0.125 (2.55)*	0.162 (3.21)**	0.091 (1.13)	0.056 (0.56)	0.028 (0.34)
Minimum wage (d)	0.009 (0.19)	0.004 (0.10)	-0.123 (8.77)**	-0.125 (8.86)**	-0.179 (3.99)**	--	-0.116 (6.09)**	-0.345 (5.32)**	-0.357 (3.58)**	--
Observations	6165	6165	5920	5920	1123	1123	535	500	214	214
R-squared	0.01	0.01	0.32	0.32	0.47	0.46	0.54	0.60	0.66	0.65

Robust t statistics in parentheses, with * indicating significance at 5 % and ** indicating significance at 1 %. Constant term included but not reported here.

(a) Includes some foreign equity over the entire period.

(b) Exports some share of output over the entire period.

(c) In the first four columns, treatment is defined as an establishment in the textiles, footwear, and apparel (TFA) sector. In the last six columns, treatment is defined as locating in a district where Nike, Adidas or Reebok contractors operate.

(d) Defined as the log of the minimum wage in 1996 less the log of the minimum wage in 1990, unless the plant pays above the 1996 minimum wage in 1990, in which case the minimum wage change is set equal to zero.

Table 8**The Impact of Treatment on Other Outcomes (Output Growth, Change in Capital Stock, TFPG, and Profits)***Dependent Variable is indicated in columns below*

	(1) Output Growth	(2) Output Growth (Textiles, Footwear and Apparel Only)	(3) Growth in Capital Stock	(4) Growth in Capital Stock (Textiles, Footwear, and Apparel Only)	(5) TFPG	(6) TFPG (Textiles, Footwear, and Apparel Only)	(7) Change in Profits	(8) Change in Profits (Textiles, Footwear, and Apparel Only)
Foreign (a)	0.038 (0.92)	0.156 (2.75)**	0.266 (4.09)**	0.022 (0.18)	-0.044 (1.32)	0.140 (3.31)**	0.034 (2.77)**	-0.008 (0.54)
Exporter (b)	-0.010 (0.39)	0.066 (0.62)	-0.111 (2.36)*	0.174 (1.56)	-0.020 (1.38)	-0.018 (0.26)	-0.014 (1.58)	0.033 (1.21)
TREATMENT (c)	-0.011 (0.67)	0.075 (1.90)	0.005 (0.15)	0.174 (4.98)**	-0.015 (1.99)	0.044 (2.03)	0.006 (0.83)	0.035 (9.67)**
Foreign* TREATMENT	0.100 (2.62)**	-0.082 (1.02)	-0.244 (2.67)**	-0.077 (0.63)	0.095 (3.77)**	-0.172 (3.84)**	-0.062 (3.80)**	-0.05 (2.13)*
Exporting* TREATMENT	0.023 (0.57)	-0.092 (0.88)	0.133 (1.90)	-0.248 (1.67)	-0.007 (0.19)	-0.019 (0.25)	0.018 (0.85)	-0.039 (1.88)
Observations	6165	1173	6165	1173	5920	1123	5915	1135
R-squared	0.71	0.79	0.24	0.31	0.05	0.10	0.20	0.28

Robust t statistics in parentheses, with * indicating significance at 5 % and ** indicating significance at 1 %. Constant term included but not reported here. Definitions for TFPG and profits given in Table 1B.

Notes:

(a) Includes some foreign equity over the entire period.

(b) Exports some share of output over the entire period.

(c) In columns (1), (3), (5), and (7) treatment is defined as an establishment in the textiles, footwear, and apparel (TFA) sector. In the other columns (2), (4), (6) and (8) treatment is defined as locating in a district where Nike, Adidas or Reebok contractors operate.

Table 9
Determinants of Exit: Probit Estimates
1988-1996 (Coefficients are Derivatives)

	Includes Controls for Educational Attainment of Employees					Excludes Controls for Average Wages, Minimum wage changes, and Educational Attainment of Employees					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	All Firms	Large Firms with at least 100 employees	TFA Firms Only	Large TFA Firms	Small TFA Firms	All Firms	Large Firms with at least 100 employees	Small Firms: less than 100 employees	TFA Firms Only	Large TFA Firms	Small TFA Firms
Foreign (a)	-0.010 (2.18)*	-0.002 (0.68)	-0.006 (1.47)	0.001 (0.16)	-0.019 (0.52)	-0.043 (6.78)**	-0.019 (3.47)**	-0.049 (4.86)**	-0.060 (8.50)**	-0.034 (4.62)	-0.079 (0.98)
Exporter (b)	0.006 (0.81)	-0.000 (0.11)	0.001 (0.13)	0.000 (0.07)	0.020 (1.34)	-0.032 (2.47)**	-0.024 (2.15)*	0.017 (1.14)	-0.027 (1.31)	-0.009 (1.05)	-0.020 (0.42)
TREATMENT (c)	0.009 (4.48)**	0.010 (3.01)**	-0.005 (0.77)	-0.000 (0.00)	-0.015 (1.47)	0.018 (3.92)**	0.017 (2.75)**	0.025 (5.16)**	-0.018 (0.92)	0.002 (0.18)	-0.032 (1.56)
Foreign* TREATMENT	-0.007 (0.84)	-0.007 (1.30)	-0.021 (2.00)*	-0.015 (2.68)**	--	-0.024 (2.85)**	-0.023 (2.69)**	-0.019 (0.36)	-0.013 (0.64)	-0.028 (1.96)*	0.020 (0.16)
Exporting* TREATMENT	-0.005 (0.98)	-0.002 (0.59)	0.005 (0.33)	0.001 (0.08)	0.045 (3.48)**	0.016 (0.99)	0.021 (1.71)	-0.019 (0.50)	0.032 (1.29)	0.002 (0.19)	0.155 (2.20)*
Change in Minimum Wage	0.075 (2.61)*	0.059 (3.37)**	0.087 (2.36)*	0.056 (2.98)**	0.108 (1.96)*	--	--	--	--	--	--
Observations	81840	28438	15847	7004	8748	93757	30988	62719	18367	7657	10666

Dependent variable is a dummy variable equal to 1 if the plant exits and equal to zero if the plant survives in period t+1. All independent variables are from period t. Observations are annual data taken from the full unbalanced panel for 1990 through 1996. Robust z statistics in parentheses. A “*” indicates significance at 5%; ** significance at the 1% level. Reported coefficients are the change in the probability of exit, evaluated at the sample mean. All specifications include the full set of controls from the previous tables.

Notes:

(a) Includes some foreign equity over the entire period.

(b) Exports some share of output over the entire period.

(c) In columns (1), (2), (6), (7), and (8) treatment is defined as an establishment in the textiles, footwear, and apparel (TFA) sector. In the other columns treatment is defined as locating in a district where Nike, Adidas or Reebok contractors operate.

Table 10
Impact of Compliance with Minimum Wages on Wage and Employment Outcomes

	Dependent Variable is Change in Compliance with Minimum Wage			Dependent Variable is Change in the Log of Production Wages				Dependent Variable is Change in the Log of Production Workers	
	All Enterprises and All Controls	Textiles, Footwear and Apparel Only	Footwear and Apparel Only	All Enterprises and All Controls	All Enterprises with at least 100 Employees	Textiles, Footwear, and Apparel Only	Footwear and Apparel Only	All Enterprises	Textiles, Footwear, and Apparel Only
Foreign or Exporter FOREXP (a)	0.027 (1.43)	0.082 (0.97)	-0.113 (1.07)	-0.002 (0.08)	-0.068 (1.65)	0.044 (1.13)	-0.130 (1.18)	0.019 (0.80)	0.041 (1.55)
TREATMENT (b)	-0.105 (7.14)**	0.106 (7.43)	0.009 (0.48)	-0.049 (1.60)	0.020 (0.37)	0.194 (2.62)*	0.239 (4.06)**	0.030 (0.97)	-0.026 (0.27)
FOREXP*TREATMENT	0.151 (2.90)*	0.124 (1.47)	0.371 (3.44)**	0.007 (0.08)	-0.047 (0.43)	-0.021 (0.31)	0.111 (1.14)	0.003 (0.04)	0.159 (1.10)
Minimum Wage (c)	-0.082 (1.10)	-0.142 (1.23)	0.027 (0.12)	0.659 (6.95)**	0.678 (5.75)**	0.696 (9.46)**	0.999 (5.45)**	-0.121 (8.00)**	-0.197 (3.54)**
TREATMENT*Minimum Wage	--	--	--	0.020 (0.47)	-0.077 (0.72)	-0.223 (3.57)**	-0.375 (3.38)**	-0.044 (1.58)	0.046 (0.55)
TREATMENT*FOREXP*Min Wage	--	--	--	0.177 (1.61)	0.287 (2.07)*	0.165 (6.49)**	0.271 (2.67)*	0.164 (2.61)*	-0.002 (0.01)
Observations	5875	1114	494	5920	2431	1123	500	5920	1123
R-squared	0.10	0.13	0.16	0.23	0.23	0.29	0.34	0.32	0.47

Robust t statistics in parentheses, with * indicating significance at 5 % and ** indicating significance at 1 %. Constant term included but not reported here. Compliance is a zero-one dummy variable equal to one if the establishment's average production worker wage is above the district statutory minimum wage.

Notes:

- (a) Includes some foreign equity or exports over the entire period
- (b) In columns (1), (4), (5), and (8) treatment is defined as an establishment in the textiles, footwear, and apparel (TFA) sector. In the remaining columns, treatment is defined as locating in a district where Nike, Adidas or Reebok contractors operate.
- (c) Defined as the log of the minimum wage in 1996 less the log of the minimum wage in 1990, unless the plant pays above the 1996 minimum wage in 1990, in which case the minimum wage change is set equal to zero.

Appendix Table 1: Mean Minimum Wage and Selected Wages for Indonesia 1988-1999

Year	Consumer Price Index with 1996= 100	Minimum Wage in Nominal Values	Minimum Wage in 1996 Values	Minimum Wage in US dollars	Exchange Rate in Rupiahs per dollar	Non-TFA Wages		TFA Wages (Production Workers)		
						Production Workers	Non-Production Workers	Domestic Enterprises	Exporters	Foreign-ownership
1988	0.527	351	667	388	1717	1242	2935	1025	1325	2072
1989	0.561	355	634	355	1787	1272	3137	1053	1461	2125
1990	0.604	503	833	443	1882	1288	3154	1078	1462	1755
1991	0.661	633	957	484	1982	1352	3351	1120	1417	1685
1992	0.711	717	1008	492	2051	1479	3567	1239	1604	1931
1993	0.780	832	1066	509	2095	1537	3769	1278	1732	1846
1994	0.846	1193	1409	652	2160	1610	3775	1310	1888	2015
1995	0.926	1418	1531	684	2239	1665	3921	1346	1971	2063
1996	1.000	1560	1560	644	2348	1752	4017	1441	2079	2269
1997	1.067	1699	1592	539	2953	1858	4870	1515	2723	2499
1998	1.680	1963	1167	118	9875	1589	4010	1287	1808	2347
1999	2.027	2308	1138	146	7809	1645	4926	1220	2037	2528

All real values are base 1996. TFA indicates the textile, apparel, or footwear sector
All Indonesian currency is in 1,000s of rupiahs. All wages are annual means

Appendix Table 2: Firm-specific and District-specific Determinants of the Minimum Wage for 1990-1996

Dependent Variable: Log of the Minimum Wage

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dummy for Location in Treatment District	0.073 (1.69)	0.138 (4.25)**	0.073 (1.69)	--	0.103 (2.10)*	0.074 (1.70)	0.138 (4.25)**	0.073 (1.70)	--	0.103 (2.20)*
TFA Sector Dummy	-0.006 (0.28)	-0.0004 (0.02)	--	-0.005 (0.26)	-0.033 (1.13)	-0.006 (0.29)	-0.0004 (0.02)	--	-0.006 (0.27)	-0.034 (1.15)
Output Growth	0.002 (1.28)	0.002 (0.90)	0.002 (1.28)	0.002 (1.28)	0.004 (1.29)	0.003 (1.58)	0.002 (1.38)	0.003 (1.58)	0.003 (1.58)	0.005 (1.45)
Total Factor Productivity Growth	-0.009 (1.84)	-0.005 (1.09)	-0.009 (1.84)	-0.009 (1.85)*	-0.018 (2.19)*	-0.009 (1.81)	-0.005 (1.05)	-0.009 (1.81)	-0.009 (1.82)	-0.018 (2.15)*
Lag log production wages	--	--	--	--	--	0.007 (2.37)*	0.010 (3.40)**	0.007 (2.37)*	0.007 (2.37)*	0.009 (1.45)
Wholesale Price Index	-0.071 (1.70)	-0.074 (1.72)	-0.070 (1.70)	-0.089 (2.46)**	-0.151 (2.61)**	-0.070 (1.69)	-0.073 (1.72)	-0.070 (1.69)	-0.071 (1.68)	-0.150 (2.59)*
Consumer Price Index	0.669 (14.13)**	0.802 (16.03)**	0.660 (14.15)**	0.661 (13.74)**	0.690 (11.76)**	0.659 (14.15)**	0.800 (16.08)**	0.658 (14.17)**	0.659 (14.05)**	0.687 (11.80)**
Foreign-ownership	-0.0001 (0.49)	-0.0001 (0.79)	-0.0001 (0.49)	0.000 (0.31)	0.000 (0.10)	0.000 (0.51)	0.000 (0.81)	0.000 (0.51)	0.000 (0.51)	0.000 (0.11)
Export share of sales (0 to 100)	-0.0001 (2.82)**	--	-0.0001 (2.82)**	-0.0001 (2.54)**	-0.0002 (2.46)*	-0.0001 (2.80)**	--	-0.0001 (2.80)**	-0.0001 (2.78)**	-0.0002 (2.44)*
Tariffs	--	--	--	--	0.001 (0.49)	--	--	--	--	0.0001 (0.48)
Number of Observations	84,204	89,247	84,204	84,204	42,047	84,204	89,247	84,204	84,204	42,047
R-square	0.61	0.66	0.61	0.60	0.62	0.62	0.67	0.62	0.81	0.63

Notes: T-statistics in parentheses. All regressions estimated taking into account fixed effects at the level of the individual establishment, with errors clustered at the district level and robust standard errors. Year dummies included in all specifications. Establishment-specific determinants of the log minimum wage include output growth, total factor productivity growth as defined in Table 1B, TFA Sector Dummy, production wages, foreign-ownership, and the export share of sales. Number of observations vary depending on availability of controls; in columns (5) and (10) the number of observations is cut in half due to the fact that tariff information is available for only half the observations.