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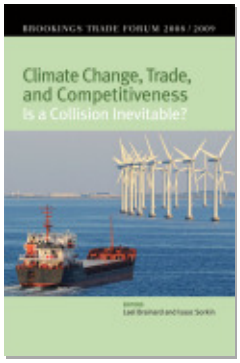

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Globalization's Impact on Compliance with Labor Standards

A number of critics have argued that the competitive pressure imposed by international competition is likely to create a race to the bottom in global labor standards. These antiglobalization forces frequently claim that competition induced by globalization leads firms to ignore (or fail to comply with) labor standards in efforts to cut costs. Exporters facing the challenges of international markets as well as multinationals facing cheap imitators from low-wage regions may each cut costs by paying lower wages, hiring child labor, and imposing unsanitary working conditions on their workers.

From this perspective, globalization is likely to undermine national efforts to impose labor standards. Even if countries are successful in passing legislation that introduces or raises labor standards, global pressures may prevent firms from adhering to them. This is likely to be the case when penalties for noncompliance are low. Under such circumstances, labor standard legislation (such as minimum wage laws) may be viewed simply as a useful but nonbinding guideline for wage-setting activities.

On the other hand, increasing political activity by human rights organizations has focused greater scrutiny on the behavior of exporting firms and large multinationals. These types of firms are increasingly being held to

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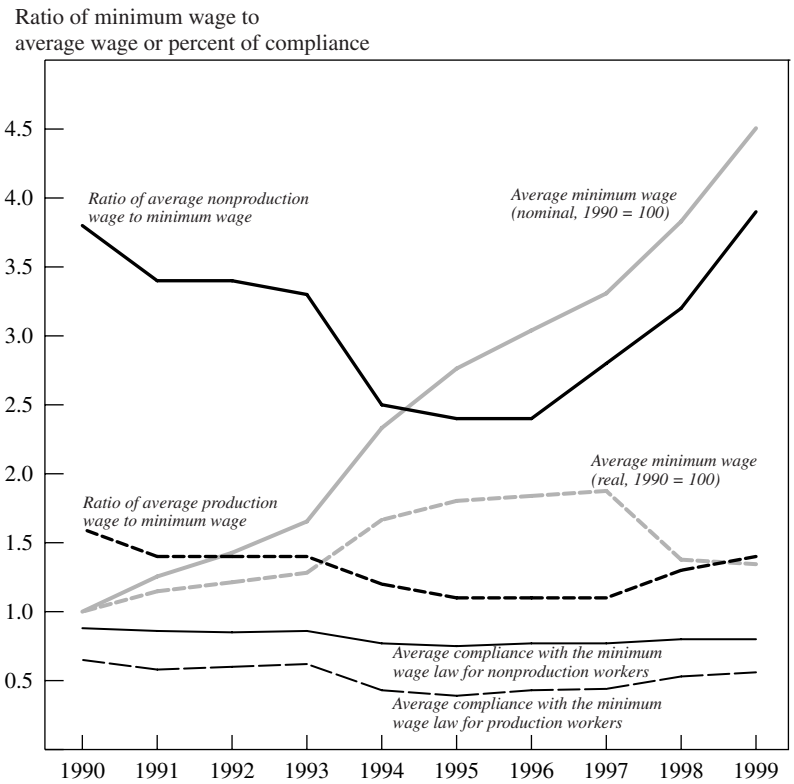
Figure 1. Average Wages, the Minimum Wage, and Compliance in Indonesia, 1990–99



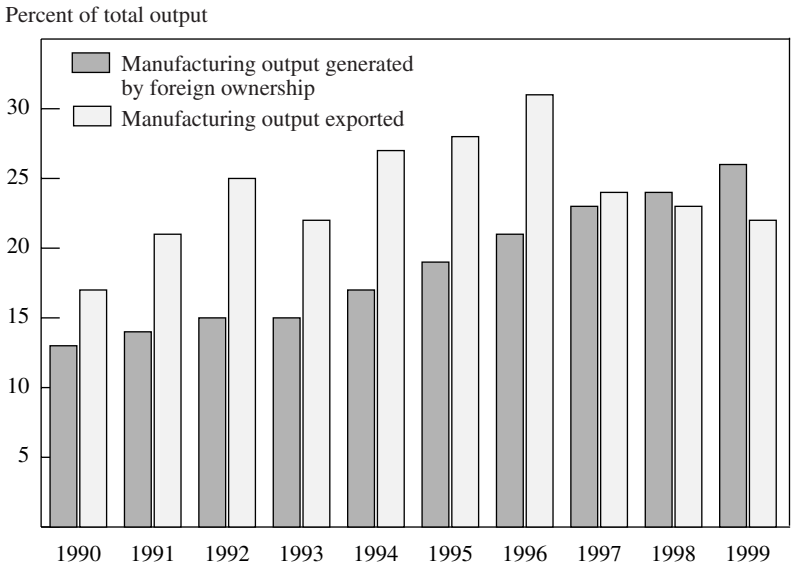
Source: Badan Pusat Statisdik.

high standards. While there are no clear international penalties for deviation from local labor legislation, the effect on a firm's reputation is potentially significant, as enterprises like Nike have learned.

In an effort to shed some light on the larger question of labor standards and globalization, we seek to examine compliance with minimum wage legislation in Indonesia. Indonesia is an ideal case study because the government made minimum wages a central component of its labor market policies in the 1990s.[1] During this time, minimum wages quadrupled in nominal terms and doubled in real terms (see figure 1). At the same time that the minimum wage's real value was soaring, Indonesia's entry into international

1. SMERU Research Institute (2001).

Figure 2. Share of Value of Indonesian Manufacturing Output Generated by Foreign Ownership or Exported, 1990–99



Source: Budan Pusat Statisdik.

markets also increased dramatically (see figure 2). The manufacturing census shows that the percentage of manufactured output that was exported doubled between 1990 and 1996, from just over 15 percent to 30 percent of final sales. In addition, foreign investment also increased. The percentage of manufacturing output accounted for by foreign firms almost doubled in the 1990s, rising from 13 percent of output to more than 25 percent of total manufacturing output in 1999.

During the 1990s, firms struggled to comply with the rising minimum wage. Rama shows that the increasing minimum wage led to a 10 percent increase in average wages, 2 percent fall in employment, and 5 percent average decline in investment.[2] Using the manufacturing census plant-level data for Indonesia, we calculated average production and nonproduction worker wages relative to the statutory minimum from 1990 through 1999. As indicated by the trends in figure 1, the ratio of production-worker wages to the minimum wage fell from a factor of more than 3-to-2 in the early

2. Rama (1996).

1990s to nearly 1-to-1 in the late 1990s. This indicates that average production-worker wages were hovering just above the minimum wage before the 1997 financial crisis. The proportion of plants paying at least the minimum declined significantly during this period. While three-quarters of all plants paid above minimum wages to production workers in the mid-1980s, by 1999 only about half of all plants paid average wages that exceeded the statutory regional minimum for production workers.

In this paper we estimate the relationship between international competition and compliance with the statutory minimum wage in Indonesia. We identify firms facing international competition with two plant-level indicators. First, we use the plant's export orientation as one measure of international competition. Second, we use the plant's foreign ownership as another measure of international competition. Critics claim that foreign firms are exploiting foreign workers, although our research on developing countries has shown that foreign enterprises are more likely to pay higher wages.[3]

This framework provides a direct test of the relationship between measures of globalization and labor standards, as defined by compliance with the regional minimum wage. As such, this proposed research follows pioneering work by Edmonds and Pavcnik, which explores how rice prices affected the use of child labor in Vietnam.[4] Edmonds and Pavcnik find that an increase in rice prices, which followed the elimination of an embargo on rice exports in Vietnam, is associated with a decline in the use of child labor. While one advantage of Edmonds and Pavcnik is that they are able to use exogenous changes in rice prices to identify the impact on child labor, our paper has the advantage that it can establish a direct link between trade orientation, ownership, and compliance with labor laws across manufacturing plants. To our knowledge, ours is the first attempt to identify the impact of global factors on compliance with labor standards using plant-level data.

We find that there is a positive relationship between compliance with labor standards, outward orientation as measured by export sales, and foreign ownership. Exporting plants are more likely to pay at least the minimum wage. However, we also find that there is a significant upward trend in compliance with minimum wage legislation for exporting enterprises during the 1990s. Since there is significant heterogeneity in worker and firm characteristics across industries, we then turn to an examination of the

3. Aitken, Harrison, and Lipsey (1996); Scorse (2003).
4. Edmonds and Pavcnik (2001).

garment and apparel industry. We find these same trends in garments and apparel.

Our results are consistent with the increasing internal and external pressures placed on Indonesia by human rights activists and other organizations in the 1990s. Internally, several independent labor unions were established in Indonesia in the early 1990s. Externally, North American and European Union (EU) groups expressed concern about Indonesian exporters and the labor market conditions of their workers, particularly in exporting sectors. Complaints by U.S. groups were filed first in the late 1980s and again in 1992, citing violation of worker rights under the Generalized System of Preferences (GSP). The GSP allows poor countries to benefit from low tariffs on their exports to the U.S. market. Although the GSP excludes textiles and apparel imports subject to the Multifibre Agreement (MFA), as well as footwear, the fact that a large share of Indonesian exports to the United States (20 percent) are covered by the GSP was enough to generate considerable pressure.[5] In addition, the Indonesian SMERU Research Institute notes that "the withdrawal of investment guarantees to U.S. companies that would ensue was a threat of potentially greater significance."[6]

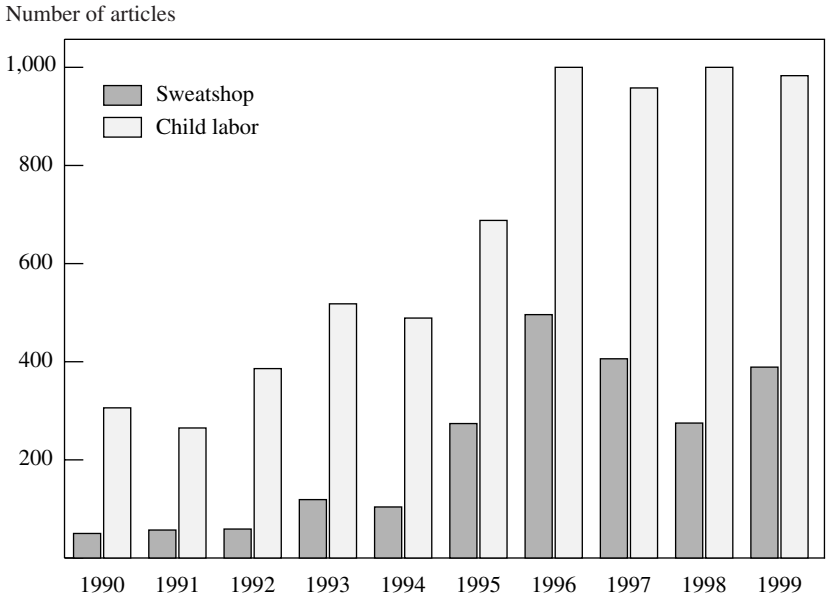
In response the Indonesian government made a number of policy changes in its minimum wage laws in the 1990s. Our analysis suggests that the government was successful in raising compliance with the minimum wage, at least in exporting sectors that were the focus of U.S. and European criticism.

The Labor Standards Debate

In the 1990s, international concern over globalization and labor standards increased dramatically. One way to gauge the extent of this newfound interest is to count the number of articles about labor standards that appeared in major newspapers in the 1990s. As figure 3 demonstrates, the number of articles about sweatshop and child labor activities increased dramatically. 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.

5. See Elliott (1998a) for a discussion of the U.S. GSP and its impact on labor standards.
6. SMERU Research Institute (2001).

Figure 3. Articles about Sweatshops and Child Labor in Major Newspapers, 1990–99[a]



Source: LexisNexis.
a. Lexis maximum is 1,000 articles.

For many globalization opponents, international labor standards have a strong intuitive appeal as a remedy for various forms of exploitation and poor working conditions common throughout the world, particularly in, but not to limited to, developing countries. If nations would only agree on some minimum set of standards, then with one grand sweep working conditions would be raised for all, or so the story goes. However, as with many well-intentioned policies, the reality is not quite so simple, and motives of many people who support labor standards may not be so benign. In order to assess more accurately their potential effectiveness, a number of questions arise.

Who sets the standards? How are they enforced and who pays for this enforcement? What is the punishment for noncompliance? What are the employment effects associated with increases in wages or costs for firms? What would likely be the distributional effects both across and within countries?

Given these complexities, it is no surprise that depending on how and to what extent labor standards are implemented, they may or may not be beneficial for the world's poorest (and most vulnerable) workers, whose interests

the standards are meant to address. The effects will largely depend on the general level of development of the country, for example, the level of education, technology, and infrastructure. In addition, the economy's share of exports may play an important role if other countries decide to erect import barriers based on noncompliance.

Although there are more than 180 international conventions (treaties) that address labor-related issues, the International Labor Organization (ILO) has established a core set of labor standards, which it articulated in its "Declaration of Fundamental Principles and Rights at Work." Typically, labor standards can be divided into two groups: core standards, which relate to fundamental human rights and can be universal in their application, and economic standards, which are more closely tied to a country's level of economic development and include elements such as minimum wage laws, levels of benefits, and working conditions. Core labor standards are further divided into four groups:

—freedom of association and the right to collectively bargain,

—elimination of forced and compulsory labor,

—elimination of employment discrimination, and

—abolition of child labor.

Two conventions pertain to each of these headings, for a total of eight core conventions. Ratification of these standards is left to individual member states. Only ninety-five nations (including most European nations) have signed all eight, though most countries have signed at least one convention. Interestingly, the United States has signed only two of the eight. Upon signing a convention, a nation is subject to: international supervision, technical and financial support (mostly for poorer countries), and potential punishment for noncompliance (although the ILO's enforcement powers are weak to nonexistent).

Chau and Kanbur postulate that if ratification of these conventions were costless, or if the benefits greatly outweighed the costs, one would expect complete compliance across countries.[7] 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. This indi-

7. Chau and Kanbur (2001).

cates that adoption may be a good proxy for labor standards and a country's legal system plays an important role, perhaps because domestic enforcement costs are highly correlated with different legal structures. Given the poor predictive power of standard economic variables, they conclude that the current understanding as to why countries choose to sign these conventions is severely limited and more research is needed.

An issue of paramount concern in any analysis of labor standards is who will shoulder the costs of increased labor standards. If an industry is perfectly competitive, additional costs will be passed directly to consumers and some firms will likely be forced out of business, whereas in imperfectly competitive industries added labor costs will be borne by producers as well, the proportion depending on the relative slopes of the demand and supply curves. Some of the more celebrated and recent successes with respect to labor standards in developing countries involve pledges by many of the world's largest shoe and garment manufacturers, such as Nike and Gap, to pay substantially higher wages in their South Asian factories. Even though the margins in these industries are reportedly very small, these companies obviously had some room to maneuver while still maintaining profitability. It is interesting to note that Nike is now planning on moving many of its Indonesian factories to Vietnam, where the average wage is much lower, although the company claims it is moving for reasons of political stability.

Issues surrounding child labor probably best highlight the tensions inherent in most discussions involving a move to stricter international standards. Since most child labor takes place in the poorest countries of the world, notably in Southeast Asia, one might reasonably suspect that these countries would be the most supportive of any initiatives to ban or limit the practice. However, the opposite is true. Fearing that such bans are simply disguised forms of trade protectionism, many high-ranking officials in India, China, and other developing countries, as well as union activists, have spoken out strongly against these efforts, which they think will unfairly reduce their country's exports. While agreeing that child labor needs to be taken seriously, these officials point out that without the option of sweatshop work many children would be in far worse situations, often involving prostitution or violent criminal behavior. This position is reminiscent of the quote by economist Joan Robinson who said "in some situations what is worse for a worker than being exploited is not being exploited."

These arguments need to be taken seriously. Discussions regarding wealthy countries' labor standards are often accompanied by claims that

home country industries are being forced to compete unfairly with developing country manufacturers who can draw on limitless pools of cheap labor. In addition, it is hard for many people in developed countries to imagine states in which sweatshop labor represents the best hope to get ahead in life. Yet this is certainly the case in large parts of the world. Neither of these points suggest, however, that simply because sweatshops may represent the best of a host of excruciatingly unpleasant alternatives, corporations should be allowed to ignore some minimal set of labor standards.

Economic theory may inform one that the equilibria one witnesses in international labor markets—which are based (almost exclusively) on voluntary exchange—are Pareto optimal. This does not mean that societies have to accept them from a normative standpoint. This brings one back to the initial questions concerning the practical implementation of any policies that attempt to impose stricter labor standards, as well as how one goes about measuring their effectiveness.

Those who argue for import restrictions on countries that employ child labor believe that this would provide an incentive for violating countries to limit the practice. However, others argue that if import barriers lead to lower incomes this will only exacerbate the problem, and in fact the rising incomes associated with freer trade will directly lead to decreases in child labor. Edmonds and Pavcnik address this question empirically using panel data from Vietnam to investigate whether increases in the domestic price of rice, associated with increased rice exports, has led to higher or lower incidences of child labor.[8] They 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. But given the trend toward massive urbanization in most developing countries, this study illustrates the potential for increased exports (particularly in agricultural commodities) to lead to higher net rates of child labor, absent any forms of government intervention.

Maskus finds no empirical evidence to suggest that a lack of international standards has led to significant erosion of low-skilled wages in devel-

8. Edmonds and Pavcnik (2001).

oped countries, or is a significant determinant of trade performance and foreign direct investment throughout the developing world.[9] Maskus also reports evidence regarding the impact of labor standards on wages in export processing zones. He claims that overall the zones pay higher wages and have better working conditions, but that in some countries the minimum wage is less likely to be enforced in export processing zones than in the rest of the country. Anecdotal evidence also suggests that efforts to organize workers in export processing zones have been routinely suppressed. Maskus points out that the altruistic reasons echoed in much of the developed world for promoting labor standards, even if sincere, are often used as a guise for trade protectionism and that natural variability in labor standards is an inevitable result of differing levels of economic, social, and cultural development.

Maskus analyzes the extent to which trade instruments such as tariffs, import quotas, and sanctions could potentially be used to enforce international compliance with a minimum set of core labor standards, specifically with respect to developing countries. He finds that trade instruments are never first best and that often they exacerbate the problems they are meant to solve (primarily because they often reduce the poorest workers' incomes). In addition, they can lead to other labor market distortions that decrease overall world welfare. He suggests a number of more targeted approaches to address contentious labor issues such as child labor, including labeling schemes as well as aid programs focused on education and poverty alleviation.

Finally, Elliott has implied in a series of persuasive articles that the confrontational approach of proglobalizers and antiglobalizing activists in the 1990s should be discarded.[10] She also argues that many efforts to protect worker rights are not thinly veiled protectionist actions, but in fact are sincerely motivated. As proof, she analyzes the pattern of countries sanctioned under the U.S. GSP for not protecting worker rights.[11] It is likely that globalization's current pace cannot be sustained unless it is made clear that globalization benefits all the workers, not just a chosen few. Approaches need to be developed that allow globalization to proceed, but at the same time protect the rights of workers.

9. Maskus (1996).
10. Elliott (1998b and 2000).
11. Elliott (1998a).

Estimation Framework

One of the earliest papers that explicitly modeled a firm's decision whether to comply with a minimum wage is Ashenfelter and Smith.[12] It shows that a profit-maximizing employer will choose not to comply with a minimum wage if the gains from disobeying the law outweigh the potential costs from noncompliance. If an employer faces a probability p of being caught and incurs a penalty F, then it can be shown that firms will comply with minimum wage legislation if

$$G/L - (M - w) + (1/2w)[M - w]^2 e > 0, \tag{1}$$

where G is a function of the probability of detection p and the penalty, F; L is the number of employees in the firm; M is the minimum wage; w is the average wage paid by the firm; and e is the elasticity of demand for labor and is less than zero.

If one simplifies the analysis and sets the elasticity of labor demand equal to zero, then firms would comply with minimum wage legislation if the expected penalty from violating the law, given by G/L, exceeds the additional compensation, given by the difference $M - w$, that needs to be paid to each employee when the firm complies with the minimum wage. As indicated by equation 1, firms are more likely to comply with minimum wage legislation if the probability of detection or penalty is high, if the minimum wage M is low, or if the firm pays high wages. Since a large number of employees reduces the per employee cost of compliance in terms of the penalty F per worker, large firms are also less likely to comply, after controlling for the probability of detection and other factors.

Equation 1 suggests that one can set up an indicator variable:

$$\begin{aligned} X_{it} &= 1 \text{ if } G/L - (M - w) + (1/2w)[M - w]^2 e > 0, \\ &= 0 \text{ if } G/L - (M - w) + (1/2w)[M - w]^2 e < \text{or equal to } 0. \end{aligned} \tag{2}$$

This will be estimated using a probit specification. Estimating equation 2 requires information on minimum wages; the wage, w, that would have been paid in the absence of minimum wage regulations; employment, L; and measures of the probability of compliance and penalties associated with noncompliance. One also needs to control for differences in types of work-

12. Ashenfelter and Smith (1979).

ers. Minimum wages in Indonesia vary across districts (indexed by r) and over time (indexed by t). These are available from the government and are reported in appendix table A-1. Since w is the wage that would have prevailed in the absence of minimum wage legislation, w is normally not observed. However, in the Indonesian case, around half of all firms do not comply with the minimum wage. Consequently, w is defined as the average wage in region r at time t across all firms that do not comply with the minimum wage. However, w is probably a (downward-biased) measure of the true w, since presumably firms that face a higher gap between w and M are those most likely to violate the law.

For Indonesia, there is no existing evidence on the probability of detection. It also appears that for domestic firms, the penalty, F, for noncompliance is probably close to zero.[13] However, for exporting or multinational firms, the costs of noncompliance could be quite large due to external pressure. It is also likely that the probability of detection has increased over time, as watchdog activists and antisweatshop organizations have increased vigilance over multinational activities in developing countries such as Indonesia. Consequently, we will focus primarily on F as a function of export status and multinational status. The setup also suggests that compliance should vary inversely with size. We will also control for size in the estimation.

According to equation 1, compliance should increase with the wage w paid by the firm in the absence of a minimum wage, and should fall as M rises. We can test this directly. The framework also suggests that compliance will rise as the probability of detection and penalties for noncompliance increase. We will test this by examining first whether firms with global contacts are more likely to comply, and second whether compliance has increased over time as the probability of detection has increased and the penalties associated with noncompliance have also increased. Consequently, we will estimate the following:

$$\begin{aligned} X_{irt} = {} & \alpha_1 + \alpha_2 M_{rt} + \alpha_3 w_{rt} + \alpha_4 DFI_i + \alpha_5 EXP_i \\ & + \alpha_6 SIZE_{irt-1} + \alpha_7 Z_{irt-1} + D_t + \omega_r + e_{it}. \end{aligned} \tag{3}$$

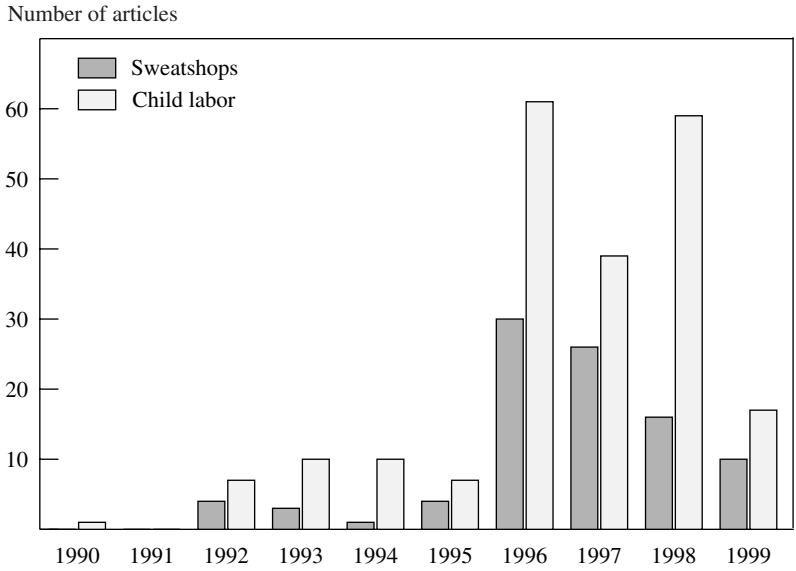
The dependent variable is a zero-one variable, which indicates whether firm i in region r at time t pays at or above the minimum wage. To address the

13. In Indonesia in the mid-1990s, the fine for noncompliance was equivalent to $50, not a large amount for most enterprises. See Rama (1996).

possibility of endogeneity bias, we will regress current compliance on lagged firm characteristics. The independent variables include export status, *EXP*, and foreign ownership, *FOR*. *EXP* and *FOR* will both be defined based on averages over the entire period. We set *FOR* equal to one if mean foreign ownership over the whole sample period is equal to or greater than 0.1 (10 percent). We set *EXP* equal to one if mean export share over the whole period is greater than 0.2 (20 percent). In an earlier version of this paper, we defined *EXP* and *FOR* as continuous variables varying between zero and 100 percent. The previous version of the paper identified the impact of ownership and export status based on annual changes in *EXP* and *FOR*, which is potentially problematic due to reverse causation. However, our current approach is less likely to lead to spurious results, since small changes in ownership or export orientation are more likely to be due to measurement error or changes in compliance itself. Nevertheless, both approaches yield very similar results. The vector Z includes a number of factors that could be correlated with *FOR* and *EXP* and are likely to affect X. This includes worker characteristics and other firm characteristics such as capital intensity. As indicated in figure 1, compliance is a much more serious problem for production workers. Consequently equation 3 will be estimated separately for production and nonproduction workers. Some years in the survey include additional information on employee education and experience. When available, these will also be included. Estimation will also include dummy variables to take into account the possibility of region-, time-, and industry-specific effects, captured in equation 3 by ω_r and D_t.

Why should greater international competition negatively affect compliance with labor standards? In an imperfectly competitive framework, it is easy to show that maximizing firm profits with respect to employment leads to a first order condition where wages are a positive function of final goods' prices. If domestic markets no longer are protected from foreign competition, international prices (which may be lower than domestic prices) could put downward pressure on wages (w in equations 1 and 2) and consequently lead to lower compliance with the minimum wage. If there is imperfect competition, footloose foreign firms may be more likely to appropriate rents relative to domestic enterprises. On the other hand, it is equally possible that exporters and multinational firms are more likely to comply with domestic labor standards. In the 1990s pressure from international human rights activists led a number of enterprises to be more careful about compliance with domestic labor standards. One major motivating factor was to avoid the

Figure 4. Articles about Indonesia and Sweatshops or Child Labor in Major Newspapers, 1990–99



Source: LexisNexis.

kind of negative publicity encountered by firms like Nike. In the framework above, this suggests that exporters and multinationals face both a higher p—the probability of detection—and higher penalty F. The higher p results from the additional scrutiny placed on these firms in the 1990s, while the higher penalty F is indicative of the greater costs to multinationals of acquiring a negative reputation with respect to compliance with labor standards.

To the extent that antisweatshop activism in the 1990s affected multinational and exporter behavior, we would expect exporters and multinationals to increase compliance over time. Figure 4 shows that the number of newspaper articles that have highlighted sweatshop or child labor activities in Indonesia has multiplied. This suggests that both F and p have probably increased.

If compliance has increased, this suggests a modified version of equation 3:

$$X_{irt} = \alpha_1 + \alpha_2 M_{rt} + \alpha_3 w_{rt} + \alpha_4 DFI_i + \alpha_5 EXP_i + \alpha_6 SIZE_{irt-1} + \alpha_7 Z_{irt-1} + \alpha_1 D_t{*}DFI_i + \alpha_2 D_t{*}EXP_i + D_t + \omega_r + e_{it}. \quad (4)$$

Activism was also concentrated in key sectors such as textiles and apparel. Consequently, we analyze whether compliance rates for multinationals vary across sectors. To the extent that activism may have led to higher compliance rates for some multinationals in certain sectors, we would also expect differential effects on production worker employment. An examination of how differential compliance may have affected employment follows.

Compliance in Indonesia

The data for this analysis comes from the annual manufacturing survey of Indonesia collected and compiled by the Indonesian government's statistical agency, Badan Pusat Statisdik (BPS). The completion of this survey is mandatory under Indonesian law. Therefore the data captures the entire population of Indonesian manufacturing firms, which ranged from approximately 13,000 in 1990 to more than 18,000 in 1999. The survey includes over 400 questions in any given year, the large majority of which remain constant, although in certain periods additional questions are included and others removed. Over the ten-year period, there is an average of 4.5 observations per firm, reflecting the fact that some firms go out of business, while others enter.

There are two obvious sources of measurement error in the data. The first is human error in either completing the questionnaire or reading the data from it. A fairly significant percentage of the observations include nonsensical entries such as a negative number of workers, negative age of the firm, or zero level of output. These observations were dropped. This could potentially bias the results if they were systematic, but an inspection of the data revealed no underlying patterns in the erroneous values.

Another potential source of measurement error is the inclusion of purposefully untruthful information. Given that Indonesia has minimum wage laws, there would appear to be an incentive for firms to exaggerate wages in order to feign compliance. However, whether due to ignorance of these laws or a lack of enforcement, a very large percentage of firms reported wages significantly below the minimum for a number of years. These compliance estimates are consistent with other studies that examine compliance with the minimum wage in Indonesia, including those by the Indonesian SMERU Research Institute and Alatas and Cameron.[14] These studies, based on both

14. SMERU Research Institute (2001) and Alatas and Cameron (2003).

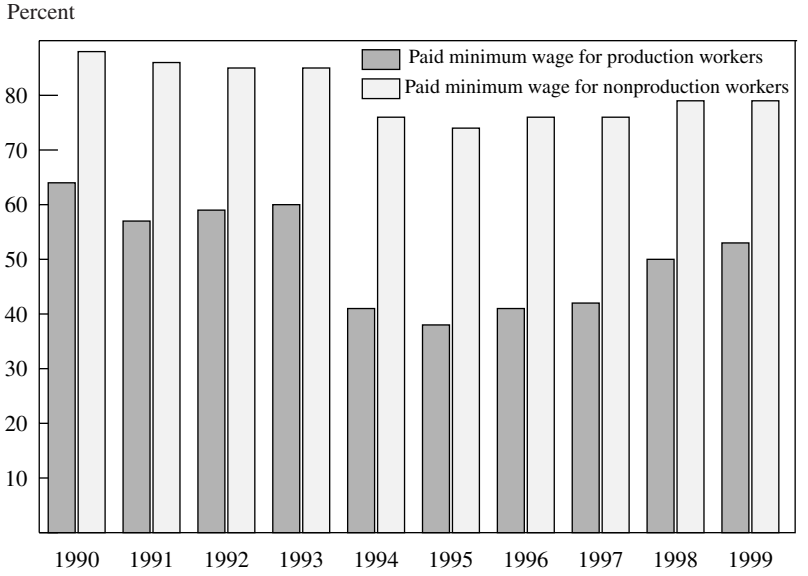
worker surveys and the Indonesian Labor Force Survey (Sakernas), indicate that "a sizable portion of the sample is receiving less than the minimum wage."[15] The SMERU Research Institute analyzed compliance rates with the minimum wage in Indonesia using a sample of forty firms that reported worker-specific wages within each firm, as well as the national labor force survey. They found compliance rates of about 70 percent, comparable to those reported in figure 1. Alatas and Cameron report the kernel density estimates of the monthly wage distribution for West Java and Jakarta.[16] These figures, based on the individual-level surveys, also imply rates of noncompliance as high as 40 percent. These high levels of noncompliance are likely to be accurate, since individual households have no incentive to misreport their earnings for the labor force surveys. Using plant-level data for Morocco, Harrison and Currie also find self-reported noncompliance rates of up to 50 percent in Morocco, presumably due to a lack of enforcement or fear of penalties as well.[17] These other studies, many of them also on Indonesia, suggest the high rates of noncompliance with the minimum wage reported in figure 1 are likely to be accurate.

We begin by identifying broad trends in minimum wage compliance in Indonesia, focusing on the period from 1990 through 1999. We focus on this period because information on export orientation was not collected before 1990, and information on worker characteristics is only available during the mid-1990s. Using the manufacturing census plant-level data for Indonesia, we calculated average production and nonproduction worker wages relative to the statutory minimum from 1990 through 1999. Since the minimum wage is supposed to apply only to base wages, we computed compliance as the plant's average wage for production and nonproduction workers separately, compared to the minimum wage as defined in appendix table A-1. The plant's average wage is defined as basic compensation (salary) divided by the number of workers in that skill category. As indicated by the trends in figure 2, the ratio of production worker wages to the minimum wage fell from a factor of two to one, indicating that average production worker wages are now hovering just above the minimum wage.

Figure 5 shows the percentage of domestic firms that complied with the minimum wage during the 1990s. As indicated in figure 5, the percentage of

15. Alatas and Cameron (2003, p. 16).
16. Alatas and Cameron (2003).
17. Currie and Harrison (1997).

Figure 5. Domestic Firm Compliance with Minimum Wage Laws, Indonesia, 1990–99



Source: Budan Pusat Statisdik.

domestic firms that paid the minimum wage to production workers ranged from 65 percent in 1990 to a low of less than 40 percent in 1995. In the mid-1990s, less than half of all domestic enterprises paid an average wage to production workers that exceeded the statutory minimum. Since nonproduction workers were paid a higher wage, the extent of compliance with the minimum wage for nonproduction workers is significantly greater. Compliance with the minimum wage for nonproduction ranged from a low of 75 percent in the mid-1990s to a high of nearly 90 percent in 1990. Nevertheless, a large fraction of domestically owned enterprises failed to pay average wages above the statutory minimum.

Figure 6 compares compliance with minimum wage laws for firms with and without foreign ownership. Panel a of figure 6 reports compliance rates for production workers, while the bottom portion reports compliance for nonproduction workers. A remarkable difference in compliance rates across both sets of enterprises is demonstrated, although the differences are much larger for (the lesser paid) production workers. Compliance rates for foreign firms during the mid-1990s were nearly double those for domestic enter-

Figure 6. Firm Compliance with Minimum Wage Laws, Based on Domestic or Foreign Ownership, Indonesia, 1990–99

Source: Budan Pusat Statisdik.

prises. While less than 40 percent of domestically owned enterprises paid production workers average wages that exceeded the minimum wage in 1995, 70 percent of foreign firms did so. At the beginning of the decade, almost 90 percent of all foreign enterprises paid average wages that equaled or exceeded the statutory minimum. While compliance rates fell in the mid-1990s, by 1999 more than 80 percent of foreign enterprises paid wages that exceeded or equaled the statutory minimum for production workers. The results for nonproduction workers (panel b) are similar, but the differences are less dramatic. Over all years, foreign enterprises were significantly more likely to comply with the statutory minimum wage, with 90 percent of all enterprises paying average wages to nonproduction workers that equaled or exceeded the minimum wage. For domestic enterprises, the rate of compliance is lower: compliance ranged from 70 percent in 1995 to slightly over 90 percent in 1990.

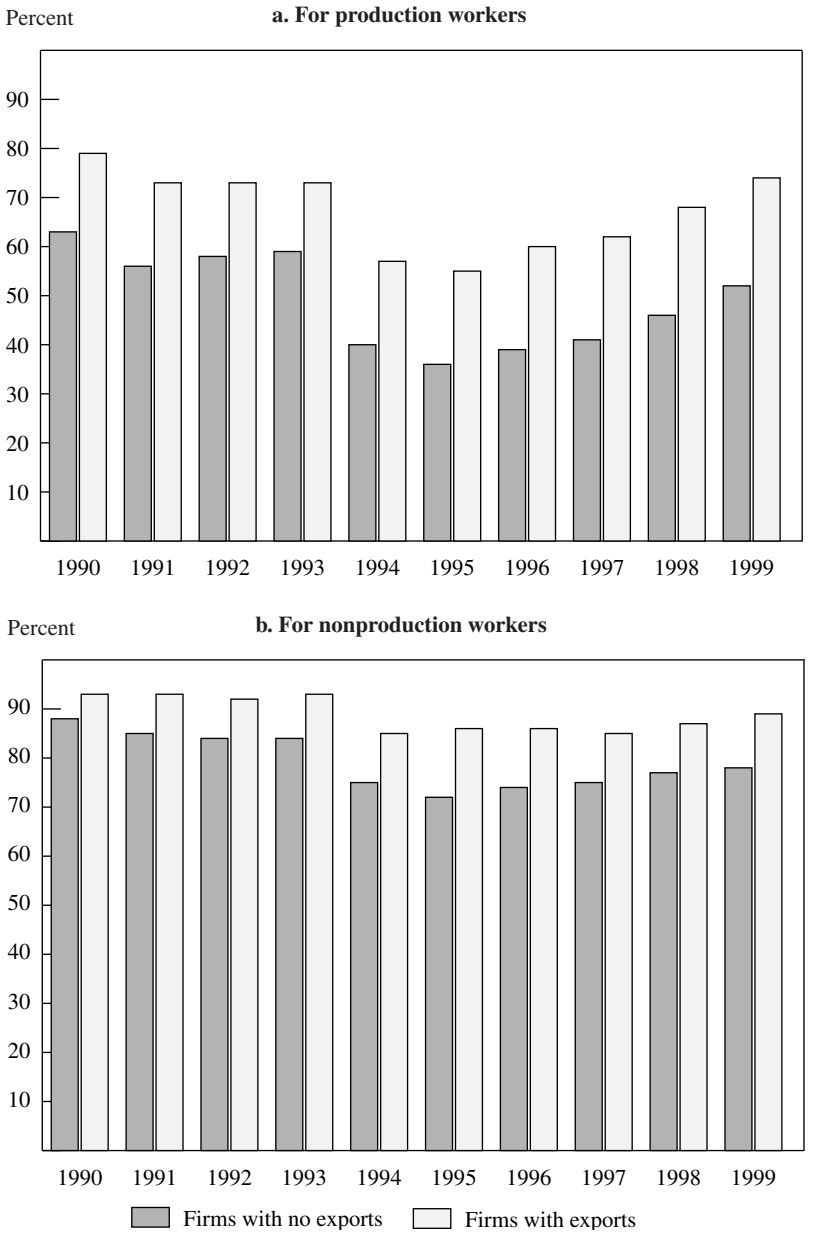
Figure 7 compares the extent of minimum wage compliance across domestic plants that exported a percentage of their sales abroad versus those oriented toward the domestic market. Over the entire time period the percentage of domestic exporters that complied with the minimum wage laws for production workers was consistently fifteen to twenty points higher than for domestic plants that only produced for the domestic market (panel a). The results for nonproduction workers are also similar, but less pronounced (panel b). Again, exporting firms were significantly more likely to comply with minimum wage legislation than firms oriented toward the domestic market.

These broad trends appear to suggest that multinationals and other firms exposed to international competition are more likely to comply with minimum wage legislation. These trends also suggest that compliance with minimum wage legislation has increased over time, particularly for firms faced with international competition. The more formal results, presented below, confirm the trends outlined in these figures.

Estimation Results

The first set of econometric results is presented in table 1. We begin with the results for production workers, who are considered (an imperfect proxy for) unskilled workers. Rather than report the coefficients derived from the maximum likelihood estimation, we report the implied change in the probability of compliance due to a marginal change in the independent variable.

Figure 7. Domestic Firm Compliance with Minimum Wage Laws, Based on Export Status, Indonesia, 1990–99



Source: Budan Pusat Statisdik.

Table 1. Probit Results for Dependent Variable Pay Minimum Wage[a]

	Production workers			*Nonproduction workers*		
Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Log Minwage	–.7377	.1549	.2482	–.2780	.0597	.1304
	(.022)**	(.050)*	(.070)**	(.018)**	(.052)	(.052)*
Log Nominwage	.2770	.2512	. . .	.1341	.2348	. . .
	(.008)**	(.015)**		(.005)**	(.012)**	
Foreign (*FOR* > 0.1)	.2040	.1925	.0871	.0722	.0771	–.0036
	(.006)**	(.011)**	(.021)*	(.005)**	(.0008)**	(.011)
Exports (*EXP* > 0.2)	.0575	.0556	–.0401	.0581	.0653	.0053
	(.005)**	(.008)**	(.009)**	(.003)**	(.006)**	(.007)
SIZE (–1)	.0001	.0001	–.00005	(.00006)	.00007	–.00005
	(.000004)**	(.000006)**	(.000006)**	(.000004)**	(.000007)**	(.000005)**
Worker controls[b]	No	Yes	Yes	No	Yes	Yes
Plant controls[c]	No	No	Yes	No	No	Yes
Dummies (all)[d]	Yes	Yes	Yes	Yes	Yes	Yes
Period	1990–99	1995–97	1995–97	1990–99	1995–97	1995–97
Number of observations	110,032	39,612	30,878	89,042	32,030	30,857
R^2	.1341	.1200	.1430	.0871	.0872	.1238

* Significant at the 5 percent level; ** significant at the 1 percent level.
a. Standard errors are in parentheses.
b. Log number of male and female employees by educational category (no school, some primary, junior high, senior high, and college).
c. Capital inputs, materials, prices, and technology expenditures.
d. Province dummies, ISIC dummies, and year dummies.

At the sample mean, the predicted probability of compliance with the minimum wage is 49 percent for production workers and 80 percent for nonproduction workers. As indicated by the earlier figures, compliance is much more of a problem for production workers.

As expected, a higher minimum wage results in lower compliance. The implied probability, –0.738, suggests that a 1 percent increase in the mandated minimum wage at the sample mean would lower compliance by 0.7 percent. Higher wages in the absence of minimum wage legislation, captured by the average wage for noncomplying firms, also lead to higher compliance. As expected, if the wage that would have been paid in the absence of minimum wages is higher, then the costs of complying with the legislation are lower and compliance is more likely. The point estimate suggests that a 10 percent increase in the wage that would have been paid in the absence of the minimum would lead to an increase in the probability of compliance of almost 3 percent. These results are consistent with the broad trends outlined earlier, where we saw an increase in the statutory minimum wage in the earlier part of the decade accompanied by a fall in compliance. Following the 1997 crisis (when the rate of inflation soared), the real value of the minimum wage declined and the real value of the alternative wage rose. Both trends were accompanied by an increase in compliance.

The coefficients on *DFI* and *EXP* indicate that exporting plants and plants with foreign equity participation are more likely to comply with minimum wage legislation. The point estimate on *DFI* suggests that if a foreign owner were to take over a domestic enterprise, compliance with minimum wage legislation would increase by 20 percent. The coefficient on export status suggests that an exporting plant is 6 percent more likely to comply with minimum wage legislation than a nonexporter. The only variable that is not consistent with expectations is *SIZE*. Larger plants are more likely to comply with minimum wage legislation. Size, however, is a proxy for many other factors, which are included later in the analysis.

The fourth column of table 1 examines the determinants of compliance with minimum wage legislation for nonproduction workers. The results are similar, but the importance of factors such as minimum wages, alternative wages, and plant-level characteristics are less significant. This is in part because nonproduction workers are generally higher skilled workers and wage determination is less likely to be affected by minimum wage legislation. The results suggest that foreign ownership would result in a 7 percent

higher probability of compliance with minimum wages for these types of workers. For exporters, the probability is 6 percent higher.

The second and fifth columns of table 1 add details on educational attainment for employees at the individual plant. However, the sample is restricted to the years 1996 through 1998, the only three years during which the survey included questions regarding the educational attainment of the plant's labor force.[18] Although not shown, the results suggest that as the share of more-educated workers in the plant rises, the probability of compliance with the minimum wage also rises. Even for women, who are significantly less likely to receive the minimum wage no matter their education level, the probability that they will receive at least the minimum wage rises as their educational attainment rises. The addition of controls for educational attainment does not affect the magnitude or the significance of the coefficients on *DFI* or *EXP*, which remain positive and statistically significant.

The third and sixth columns in table 1 restrict the analysis to 1996 through 1998, but include additional plant-level controls. Plant-level controls include the logs of real material inputs, real value of the reported capital stock, the average wages for production and nonproduction workers in the region, the output price for that four-digit sector, and investment in machinery at the plant level. If we include these additional controls, the coefficient on *FOR* in the production worker specification is cut in half, but remains statistically significant and positive. The coefficient on *EXP* for production workers becomes statistically significant and negative. In column 6, which reports the results for nonproduction workers, both *DFI* and *EXP* become small in magnitude and statistically insignificant. Why? Both *DFI* and *EXP* are highly correlated with capital stock. In previous regressions, ownership and trade orientation were significant partly because they are a proxy for capital intensity. The results in columns 3 and 6 provide an explanation for why multinationals and exporters are more likely to pay the minimum wage: they are more capital-intensive, highly productive enterprises whose workers are more highly paid.

The fact that the coefficient on *EXP* switches signs, from significantly positive to significantly negative, is worth discussion. Without plant controls, we find that exporting enterprises are more likely to comply with min-

18. The education variables are only available for 1995–97, but because we use lags, the years in the estimation are 1996–98.

imum wage legislation. These results confirm what we find in the graphs. Without controlling for plant characteristics, we find that these firms are more likely to comply with minimum wage legislation. However, once we control for plant characteristics, we find less compliance among exporters. In other words, among plants with the same characteristics in terms of capital intensity, technology, and so on, exporters are less likely to comply. This result is consistent with the idea that international competition forces firms to cut wages.

Table 2 reports the results of estimating equation 4, where we allow the coefficient on *DFI* and *EXP* to vary over time. The basic results, reported in columns 1 and 4 for production and nonproduction workers, are generally consistent with the earlier specification. However, the only coefficient that appears to vary as a function of time is the coefficient on export status for production workers. The coefficient on *EXP***t* indicates that the probability of compliance with minimum wage legislation increased by almost half a percent a year. This result is robust across specifications. The evidence for Indonesia suggests a strong increase in compliance with minimum wage legislation for exporting plants.

If we restrict the sample to the three years that report worker characteristics, the results are similar and even more pronounced. The implied probabilities are reported in columns 2 and 4 of table 2. Again, the results suggest that there is no clear trend in compliance over time for foreign enterprises, but that exporters became more likely to pay minimum wages to their production workers over the sample period. During those three years, during the peak of antisweatshop activism, the likelihood of compliance for exporters increased by about 4 percentage points a year.

The third and sixth columns of table 2 include additional plant-level controls. As in table 1, the addition of plant controls reduces the magnitude and statistical significance of the coefficients on *EXP* and *DFI*. Again, it appears that the factors driving the higher compliance of foreign and exporting plants with minimum wage laws are their higher productivity and capital intensity. In the early part of the 1990s, there is a marked difference between the degree of compliance across exporters and nonexporters: the coefficient on *EXP* suggests that exporting firms were 12 percentage points more likely to fail to comply with the minimum wage, compared to other firms with similar characteristics. However, over time the rate of compliance among exporters increased faster than among nonexporters, resulting in a higher probability of compliance by the end of the decade.

Table 2. Probit Results for Dependent Variable Pay Minimum Wage, with Interaction Terms[a]

	Production workers			*Nonproduction workers*		
Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Log Minwage	–.7376	.0870	.2153	–.2791	.0593	.1283
	(.022)**	(.062)	(.071)**	(.018)**	(.052)	(.052)*
Log Nominwage	.2770	.2556	. . .	.1343	.2349	. . .
	(.008)**	(.015)**		(.005)**	(.012)**	
Foreign (–1)	.1965	.1979	.0902	.0526	.0772	–.0007
	(.017)**	(.028)**	(.031)**	(.014)**	(.022)**	(.027)
Exports (–1)	.0318	–.0259	–.1168	.0638	.0645	–.0028
	(.011)**	(.017)	(.019)**	(.008)**	(.014)**	(.016)
*FOR**year (–1)	.0013	–.0020	–.0014	.0041	–.00007	–.0014
	(.003)	(.013)	(.014)	(.003)	(.012)	(.012)
*EXP**year (–1)	.0046	.0396	.0388	–.0011	.0004	.0040
	(.002)**	(.007)**	(.009)**	(.001)	(.007)	(.007)
SIZE (–1)	.0001	.0001	–.00005	.00006	.00007	–.00005
	(.000004)**	(.000006)**	(.000006)**	(.000004)**	(.000007)**	(.000005)**
Worker controls	No	Yes	Yes	No	Yes	Yes
Plant controls	No	No	Yes	No	No	Yes
Dummies (all)	Yes	Yes	Yes	Yes	Yes	Yes
Period	1990–99	1995–97	1995–97	1990–99	1995–97	1995–97
Number of observations	110,032	39,612	30,878	89,042	32,030	30,857
R^2	.1342	.1206	.1436	.0872	.0872	.1239

** Significant at the 1 percent level.
a. Standard errors are in parentheses. See also notes to table 1.

Much of the debate over labor standards has focused on certain key industries. In particular, much of the attention has focused on sweatshop activities such as textiles and apparel. In table 3 we restrict the sample to textiles, apparel, and footwear. An additional benefit of restricting the sample to these three sectors is that the employees in these industries are likely to be more homogeneous in quality, further limiting the scope for heterogeneity in the labor force.

The results reported in table 3 are similar to those presented in tables 1 and 2. The first and fifth columns of table 3 indicate that a 100 percent increase in foreign ownership or export orientation would increase the probability of compliance with minimum wages by 12–14 percent for production workers and 6–8 percent for nonproduction workers. If we add worker characteristics, the results are generally unaffected, as reported in columns 2 and 6 of table 3. Allowing the coefficient on *EXP* and *DFI* to vary over time (columns 4 and 8) also leads to results that are almost identical with the larger sample. The evidence suggests a significant increase in minimum wage compliance for exporters in the 1990s with respect to production workers, rising by almost 2 percent a year.

Although similar to tables 1 and 2, there is one result in table 3 that is quite striking: the size of the compliance effect for exporters. Exporters in these sectors are significantly more likely to comply with minimum wage legislation. This is true even if we add plant-level controls to the specification. In addition, exporters in this sector are increasing compliance over time twice as quickly as exporters in other sectors. The results in table 3 suggest that these sectors are indeed different. Whether these differences stem from human rights activism and international pressure remains a topic for future research.

Extensions, Robustness Tests, Employment Effects

This section discusses a number of additional results. If the analysis departs from the probit framework outlined above and estimates a linear probability model, the results are similar to those reported here. Alternative specifications, which introduce plant fixed effects and allow for the endogeneity of foreign ownership and export status, yield similar results. Instruments used for this analysis include the number of other foreign firms or exporters in the same location, as well as market size in the region and industry. Previous studies suggest that two of the major determinants of for-

Table 3. Probit Results for Dependent Variable Pay Minimum Wage, Textile, Apparel, and Footwear Sectors Only[a]

	Production workers				*Nonproduction workers*			
Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
Log Minwage	–.9943	.2361	.1627	–1.002	–.4070	.1756	.2006	–.4080
	(.054)**	(.165)	(.25)	(.054)**	(.045)**	(.151)	(.185)	(.047)**
Log Nominwage	.2846	.2918	. . .	.2826	.1016	.0932	. . .	.1033
	(.023)**	(.044)**		(.023)**	(.020)**	(.040)*		(.020)**
Foreign (–1)	.1153	.1081	.0312	.1036	.0600	.0674	.0168	.0684
	(.015)**	(.016)**	(.025)	(.041)*	(.010)**	(.019)**	(.022)	(.029)*
Exports (–1)	.1358	.1556	.042	.0518	.0755	.1022	.0383	.0419
	(.001)**	(.016)**	(.019)*	(.022)*	(.007)**	(.013)**	(.015)*	(.017)*
*FOR**year (–1)	. . .	. . .	. . .	.0014	. . .	. . .	. . .	–.0022
				(.006)				(.006)
*EXP**year (–1)	. . .	. . .	. . .	.0158	. . .	. . .	. . .	.0068
				(.004)**				(.003)*
SIZE (–1)	.00007	.00007	–.00003	.00006	.00004	.00003	–.00003	.00004
	(.000006)**	(.00001)**	(.000009)**	(.000006)**	(.000006)**	(.000009)**	(.000006)**	(.000006)**
Worker controls	No	Yes	Yes	No	No	Yes	Yes	No
Plant controls	No	No	Yes	No	No	No	Yes	No
Dummies (all)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years	1990–99	1995–97	1995–97	1990–99	1990–99	1995–97	1995–97	1990–99
Number of observations	21,326	7,602	5,693	21,326	16,446	5,883	5,721	16,446
R^2	.1012	.0647	.1053	.1020	.0893	.0800	.1170	.0897

* Significant at the 5 percent level; ** significant at the 1 percent level.
a. Standard errors are in parentheses. See also notes to table 1.

eign investment and export status are the size of the domestic market and agglomeration effects due to the presence of other enterprises.[19] The results are qualitatively similar to those reported here. Harrison and Scorse also explore the implications of labor standards for employment and the plant's exit decision.[20] They also analyze whether increasing foreign competition, as proxied by foreign market share, has driven domestic firms to reduce compliance with labor standards.

In this section, we focus on two important considerations: other possible explanations for the increase in minimum wage compliance for exporters in the 1990s, and the consequences for employment of higher minimum wage compliance among exporters and multinational plants. There are several alternative explanations for the increase in compliance among exporters. First, exporters may have experienced a rise in profitability relative to other firms, particularly in light of the currency crisis that led to a large devaluation of the currency and consequently improved the competitiveness of exporting enterprises. Second, exporters may have self-selected into exporting on the basis of higher profitability or higher productivity. Previous studies suggest that the more productive enterprises are most likely to export. Consequently, we redo the analysis, controlling for plant-level profitability and plant-level productivity growth, using total factor productivity growth (TFPG) as our measure of productivity. We also explore the consequences of redefining worker compensation to include in-kind payments. Minimum wage regulations provide that up to 25 percent of the wage may be provided in the form of permanent in-kind benefits such as food, lodging, or transportation. Although the majority of formal sector enterprises ignore this provision and interpret the minimum wage law as applying strictly to regular cash compensation, a number of the smaller enterprises may include in-kind payments in the wage bundle in an effort to comply with the minimum wage.

The results are reported in table 4. The coefficients on both plant-level profitability and TFPG, though not reported in table 4, are positive and significant. Plants with higher profitability or higher productivity growth exhibit higher compliance rates with minimum wage legislation. However, the addition of these controls does not alter the original results. The coeffi-

19. See Aitken, Hanson, and Harrison (1997) and Eskeland and Harrison (2003).
20. Harrison and Scorse (2003).

cient on foreign investment continues to be positive and significant, even with the addition of plant and worker controls. For foreign investment, the interaction with time continues to be insignificant, indicating no changes in compliance during the 1990s. As before, the coefficient on export status turns negative and significant with the addition of worker and plant characteristics. The coefficient on export status interacted with time is significant and positive, indicating an increase in compliance during the 1990s for exporters. These results control for increasing profitability and productivity of exporters, suggesting that the increase in compliance is not due to these kinds of previously unobserved, time-varying measures.

The bottom half of table 4 replaces the compliance measure with a measure that includes in-kind payments to workers. As indicated above, Indonesian law allows firms to include a fraction of in-kind payments as part of so-called minimum wages. If we add in-kind payments to wages, the results are unaffected. The only difference is that now the likelihood of compliance for foreign enterprises is even greater, suggesting that foreign firms pay an even larger fraction of worker salaries in the form of in-kind payments than other kinds of enterprises.

We next turn to an examination of the employment effects of higher minimum wages. 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. Before 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 the 1990s reopened the debate on the employment effects of minimum wages.[21] In their book *Myth and Measurement: The New Economics of the Minimum Wage*, 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: the existence of monopsony employers, search costs for employers, and efficiency wages. If any of these three 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 in employment. Card and Krueger document their claim with a series of

21. See Card and Krueger (1994 and 1995).

Table 4. Probit with Dependent Variable Pay Minimum Wage, Select Results[a]

	Production workers				*Nonproduction workers*			
Specification	*Foreign*	*Exports*	FOR**time*	EXP**time*	*Foreign*	*Exports*	FOR**time*	EXP**time*
1. Without worker and plant controls, 1990–99	.2040	.0575	…	…	.0722	.0581	…	…
	(.006)**	(.005)**			(.005)**	(.003)**		
2. With worker controls, 1995–97	.1925	.0556	…	…	.0771	.0653	…	…
	(.011)**	(.008)**			(.0008)**	(.006)**		
3. With worker and plant controls, 1995–97	.0871	–.0401	…	…	–.0036	.0053	…	…
	(.021)*	(.009)**			(.011)	(.007)		
4. With time interactions, 1990–99	.1965	.0318	.0013	.0046	.0526	.0638	.0041	–.0011
	(.017)**	(.011)**	(.003)	(.002)**	(.014)**	(.008)**	(.003)	(.001)
5. With worker controls and time interactions, 1995–97	.1979	–.0259	–.0020	.0396	.0772	.0645	–.00007	.0004
	(.028)**	(.017)	(.013)	(.007)**	(.022)**	(.014)**	(.012)	(.007)
6. With worker, plant, and time interactions, 1995–97	.0902	–.1168	–.0014	.0388	–.0007	–.0028	–.0014	.0040
	(.031)**	(.019)**	(.014)	(.009)**	(.027)	(.016)	(.012)	(.007)
7. With TFPG and profit margins, 1990–99	.1918	.0515	…	…	.0689	.0568	…	…
	(.006)**	(.005)**			(.004)**	(.003)**		
8. With TFPG, profit margins, and worker controls, 1995–97	.1901	.0537	…	…	.0748	.0649	…	…
	(.011)**	(.008)**			(.008)**	(.006)**		
9. With TFPG, profit margins, and worker and plant controls, 1995–97	.0830	–.0433	…	…	–.0053	.0050	…	…
	(.012)**	(.009)**			(.011)	(.007)		
10. As 7 with time interactions	.1940	.0326	–.0005	.0035	.0517	.0629	.0036	–.0012
	(.016)**	(.011)**	(.003)	(.002)	(.014)**	(.008)**	(.003)	(.001)
11. As 8 with time interactions	.1957	–.02893	–.0027	.0407	.0708	.0642	.0018	–.0002
	(.028)**	(.018)	(.013)	(.006)**	(.022)**	(.013)**	(.012)	(.007)

12. As 9 with time interactions	.0823	–.1176	–.0020	.0352	–.0118	–.0028	.0001	.0014
	(.031)**	(.019)**	(.014)	(.009)**	(.028)	(.016)	(.012)	(.007)
13. As 1 with wages, including in-kind	.1841	.0456	…	…	.1035	.1156	…	…
payments	(.006)**	(.005)**			(.008)**	(.005)**		
14. As 2 with wages, including in-kind	.1828	.0411	…	…	.1075	.1280	…	…
payments	(.011)**	(.008)**			(.011)**	(.007)**		
15. As 3 with wages, including in-kind	.0934	–.0434	…	…	–.0077	.0059	…	…
payments	(.012)**	(.009)**			(.011)	(.007)		
16. As 4 with wages, including in-kind	.1760	.0233	.0015	.0040	.0949	.0100	.0020	.0039
payments	(.016)**	(.010)*	(.003)	(.002)*	(.021)**	(.011)**	(.005)	(.003)
17. As 5 with wages, including in-kind	.1978	–.0354	–.0075	.0374	.1282	.1512	–.0120	–.0129
payments	(.027)**	(.017)*	(.013)	(.008)**	(.027)**	(.015)**	(.0145)	(.008)
18. As 6 with wages, including in-kind	.1078	–.1138	–.0073	.0351	–.0067	–.0005	–.0005	.0032
payments	(.030)**	(.019)**	(.014)	(.009)**	(.027)	(.016)	(.123)	(.007)
19. As 7 with wages, including in-kind	.1741	.0394	…	…	.0604	.0566	…	…
payments	(.006)**	(.005)**			(.006)**	(.004)**		
20. As 8 with wages, including in-kind	.1781	.0390	…	…	.0715	.0644	…	…
payments	(.011)**	(.008)**			(.008)**	(.006)**		
21. As 9 with wages, including in-kind	.0890	–.0456	…	…	–.0092	.0053	…	…
payments	(.012)**	(.009)**			(.011)	(.007)		
22. As 10 with wages, including in-kind	.1708	.0133	.0006	.0048	.0292	.0578	.0078	–.0003
payments	(.016)**	(.011)	(.003)	(.002)*	(.017)	(.009)**	(.004)*	(.002)
23. As 11 with wages, including in-kind	.1907	–.0406	–.0065	.0397	.0672	.0637	.0027	.0004
payments	(.027)**	(.018)*	(.014)	(.008)**	(.022)**	(.014)**	(.012)	(.007)
24. As 12 with wages, including in-kind	.1032	–.1114	–.0073	.0322	–.0100	.0024	.0003	.0015
payments	(.030)**	(.019)**	(.014)	(.009)**	(.027)	(.015)	(.012)	(.007)

* Significant at the 5 percent level; ** significant at the 1 percent level.
a. Standard errors are in parentheses.

papers that examine exogenous increases in minimum wages across U.S. states.

This unorthodox finding, which has caused an enormous debate among labor economists, has interesting implications for labor market policies in developing countries. If policymakers 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 a number of new studies on the impact of minimum wages on employment in developing countries. Strobl and Walsh examine the impact of a national minimum wage introduced in Trinidad and Tobago in 1998; Bell examines the impact of minimum wages in Colombia and Mexico; and Maloney and Nunez examine the impact of minimum wages in eight Latin American countries.[22] Three studies examine the impact of the rising minimum wage on employment in Indonesia.[23]

The results are mixed. For example, Bell finds that minimum wages in Colombia led to employment declines, while the minimum wage in Mexico had no impact on employment.[24] Strobl and Walsh find inconclusive effects for Trinidad and Tobago, in part because the minimum wage appears not to have been enforced across both sexes.[25] All these studies, using primarily labor force data and in some cases plant-level data, uncover widespread evidence of lack of compliance. In Honduras, for example, which has a very high minimum wage relative to average wages, the minimum wage appears to have had no impact on the wage distribution.

The most recent study, by Alatas and Cameron, uses the most sophisticated approach in its effort to identify the impact of the rising minimum wage on employment in Indonesia.[26] Using a difference-in-difference approach, the authors seek to examine whether employment in the textile and apparel sector fell as a result of the minimum wage. Following Card

22. Strobl and Walsh (2000), Bell (1997), Maloney and Nunez (2003).
23. Rama (1996), SMERU (2001), and Alatas and Cameron (2003).
24. Bell (1997).
25. Strobl and Walsh (2000).
26. Alatas and Cameron (2003).

and Krueger, they exploit the large geographic variation in the rate of increase and compare changes in employment on either side of the Jakarta-West Java border.[27] Comparing similar types of enterprises, they examine the employment impact of the minimum wage using the same census data as we use in this study, but they focus exclusively on firms in the clothing, textiles, leather, and footwear industries. They find no employment impact for large firms—foreign or domestic.

In table 5 we use the difference-in-differences (DID) approach adopted by Card and Krueger to examine the impact of minimum wages on employment in Indonesia.[28] We focus on the changes in employment between 1990 and 1996, which was the period of the large rise in both the magnitude and compliance with the minimum wage. The first column of table 5 reports the number of production workers in 1990 and 1996, and the difference between 1990 and 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. Across all enterprises, the mean number of employees increased, from an average of 131 employees per plant to an average of 149 employees per plant. Column 2 reports those same differences for plants outside textiles, apparel, and footwear (TFA), while column 3 reports those changes for plants only in the textiles, apparel, and footwear sector. Column 4 reports the difference-in-differences, which is the difference in the change in employment across TFA and non-TFA firms between 1990 and 1996. As indicated, the difference-in-differences is positive, suggesting that compared to the change in employment across other types of enterprises between 1990 and 1996, the change in employment for TFA plants was larger. The results suggest that increased vigilance vis-à-vis textiles and apparel enterprises did not appear to hurt their employment, at least relative to growth in employment of other types of enterprises.

The sections of table 5 redo this analysis in different ways. The second section of table 5 assesses the difference-in-differences in employment change for exporters only, followed by a section with analysis for foreign enterprises only. Comparing the results across the first three sections of table 5, there is no evidence that greater compliance with the minimum wage negatively affected employment in foreign enterprises, exporting

27. See Card and Krueger (1994).
28. Card and Krueger (1995).

Table 5. Changes in Mean Number of Production Workers

	All plants	*Non-TFA*	*TFA only*	*TFA only – non-TFA*
All firms				
1990	131	118	182	+64
1996	149	125	283	+158
Change 1990–96	+18	+7	+101	+94
Change 1990–96 for firms with data in both years	+46	+34	+132	+98
Firms that exported in 1996				
1990	131	118	182	+64
1996	421	328	718	+390
Change 1990–96	+290	+210	+536	+326
Change 1990–96 for firms with data in both years	+181	+125	+356	+231
Firms with foreign ownership, 1996				
1990	371	297	782	+485
1996	506	352	1110	+758
Change 1990–96	+135	+55	+328	+273
Change 1990–96 for firms with data in both years	+194	+113	+458	+345
Exporters only				
Low minimum wage				
1990	384	326	558	+232
1996	300	249	724	+475
Change 1990–96	–84	–77	+166	+243
High minimum wage				
1990	323	324	322	–2
1996	470	348	694	+346
Change 1990–96	+147	+24	+372	+348
Nonexporters only				
Low minimum wage				
1990	91	75	141	+66
1996	72	63	118	+55
Change 1990–96	–19	–8	–23	–11
High minimum wage				
1990	87	88	83	–5
1996	107	103	121	+18
Change 1990–96	+20	+15	+38	+18

enterprises, or textiles and apparel producers. In fact it is clear from table 5 that employment growth was significantly higher for exporters and foreign enterprises, as well as for textiles and apparel plants. The last two sections of table 5 provide a breakdown of high and low minimum wage regions. Within TFA enterprises, either for exporters or nonexporters, there is no evidence that higher minimum wages negatively affected employment. These results are consistent with Alatas and Cameron.[29] These somewhat unorthodox results are the subject of further research by the authors.

Conclusions

This paper addresses an ongoing concern that globalization is eroding labor standards. Despite the increasing attention to this issue, there have been no direct tests of whether firms are more or less likely to comply with labor standards when they are faced with international competition. We derive an explicit test: are multinationals or exporting enterprises more or less likely to comply with minimum wage legislation than other types of firms? The broad trends during the 1990s suggest that both multinationals and exporting firms are more likely to comply with labor standards. These trends are reinforced by the statistical tests, which show that foreign and exporting enterprises remain more likely to comply with minimum wage legislation.

However, if we add controls for capital intensity and technical change, the differences in compliance probabilities between foreign plants and other enterprises are cut in half, and the likelihood of compliance for exporters switches from positive to negative. At the beginning of the 1990s, exporters were significantly less likely to adhere to minimum wage laws compared to other similar plants. It appears that the aspect of exporters that is associated with greater minimum wage compliance is their greater capital intensity and higher investment in technical change. From a policy perspective, there are several ways to increase compliance with minimum wage laws. Encouraging export activity or multinational enterprises is one approach. Another approach would be to encourage policies that lead to capital investments and investments in new technology. Even with plant controls, however, there is no evidence that multinationals are less likely to adhere to labor standards.

29. See Alatas and Cameron (2003).

We also find that there is a significant upward trend in compliance with minimum wage legislation for exporting enterprises during the 1990s. The probability of compliance with minimum wage legislation for exporting firms increased by about 3 percent a year. We hypothesize that this upward trend is connected with pressure from the United States and European governments, human rights activists, and news coverage. Turning to an examination of the garment and apparel industry, which has been the focus of human rights groups, we find that these trends are even more striking in this sector. The significant upward trend in compliance with minimum wage laws for exporters, combined with the even stronger record for the traditional sweatshop industries, is intriguing. It suggests that human rights activism in fact has had an impact on firm behavior. The combination of activism, international pressure, and increasing outward orientation by Indonesian manufacturing enterprises suggests that, in fact, it is possible to combine more globalization with higher labor standards. The results also suggest, contrary to expectations, that forcing firms to adhere to higher labor standards need not have adverse consequences for employment.

Overall, the evidence in this paper refutes the claim that pressures to compete in the global market place are creating a race to the bottom. The evidence for Indonesia in the 1990s suggests that firms touched by the global market place were more, not less, likely to comply with labor standards. In part this increase in compliance is likely to have resulted from pressure imposed by the United States, which used the GSP as a mechanism to enforce labor standards in Indonesia, combined with increasing human rights activism. Quantifying the linkages between U.S. pressure, human rights activism, and labor market outcomes is the topic of further research. What is truly remarkable is that compliance increased despite a doubling of the real value of the minimum wage in Indonesia during this period, enormous increases in foreign investment and export sales, and a painful currency crisis that erupted in late 1997.

Table A-1. Nominal Regional Minimum Wage in Indonesia, 1985–2000

Rupiah/month

Province	*1985*	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*
Aceh	42,000	42,000	42,000	42,000	63,990	63,990	63,990	
North Sumatra	25,500	25,500	25,500	36,000	36,000	57,900	57,900	76,500
Riau	33,750	33,690	42,000	55,950	55,950	60,000	60,000	81,000
Riau Islands	33,750	33,690	42,000	55,950	55,950	60,000	60,000	81,000
Riau Batam				73,500	73,500	73,500	166,500	166,500
West Sumatra			30,000	30,000	60,000	48,000	48,000	52,500
Jambi	28,500	28,500	28,500	33,000	33,000	33,000	49,500	63,000
South Sumatra				33,000	33,000	48,000	48,000	48,000
South Sumatra Islands				33,000	33,000	48,000	48,000	48,000
Bengkulu				39,000	39,000	39,000	39,000	60,000
Lampung	18,000	18,000	31,500	31,500	31,500	52,500	52,500	52,500
Jakarta	39,000	39,000	48,000	48,000	48,000	63,000	75,000	75,000
West Java I	20,250	20,250	22,500	22,500	22,500	36,000	54,000	54,000
West Java II	20,250	20,250	22,500	22,500	22,500	36,000	54,000	54,000
West Java III	20,250	20,250	22,500	22,500	22,500	36,000	54,000	54,000
West Java IV	20,250	20,250	22,500	22,500	22,500	36,000	54,000	54,000
Central Java	19,050	19,050	19,050	23,400	23,400	23,400	48,000	48,000
Yogyakarta	13,500	13,500	21,000	21,000	21,000	27,000	27,000	37,500
East Java I	19,050	19,050	24,390	24,390	24,390	42,270	42,270	63,000
East Java II	19,050	19,050	24,390	24,390	24,390	42,270	42,270	63,000
East Java III	19,050	19,050	24,390	24,390	24,390	42,270	42,270	63,000
East Java IV	19,050	19,050	24,390	24,390	24,390	42,270	42,270	63,000
Bali I	30,000	30,000	36,000	36,000	36,000	54,000	54,000	60,000
Bali II	30,000	30,000	36,000	36,000	36,000	54,000	54,000	60,000
West Kalimantan	30,000	30,000	30,000	42,000	42,000	42,000	54,000	54,000
Central Kalimantan		25,500	25,500	30,000	30,000	30,000	48,000	48,000
South Kalimantan	19,500	28,500	28,500	28,500	34,500	34,500	39,000	68,250
East Kalimantan			30,000	30,000	30,000	48,000	48,000	48,000
South Sulawesi	27,000	27,000	27,000	30,000	30,000	30,000	40,500	52,500
Central Sulawesi			21,000	21,000	21,000	25,500	33,000	33,000
Southeast Sulawesi	15,000	22,500	22,500	22,500	22,500	47,970	47,970	63,750
North Sulawesi	15,750	15,750	25,500	25,500	25,500	25,500	60,000	60,000
West Nusa Tenggara	15,000	15,000	19,500	19,500	19,500	38,250	38,250	45,000
East Nusa Tenggara			30,000	30,000	30,000	48,000	48,000	48,000
Molucca				30,000	30,000	54,000	54,000	54,000
West Papua	48,000	48,000	48,000	48,000	54,000	54,000	72,000	72,000

continued on next page

Table A-1. Nominal Regional Minimum Wage in Indonesia, 1985–2000 (continued)

Rupiah/month

Province	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*
Aceh	78,000	94,500	105,000	115,500	128,000	147,000	171,000	265,000
North Sumatra	93,000	112,500	126,000	138,000	151,000	174,000	210,000	254,000
Riau	81,000	93,000	124,500	138,000	151,500	174,000	218,000	250,700
Riau Islands	81,000	93,000	124,500	138,000	151,500	174,000	218,000	300,000
Riau Batam	166,500	202,500	202,500	220,500	235,000	270,000	290,000	350,000
West Sumatra	57,000	75,000	97,500	108,000	119,000	137,000	160,000	200,000
Jambi	72,000	90,000	99,000	108,000	119,500	137,500	150,000	173,000
South Sumatra	69,000	90,000	105,000	115,500	127,500	146,500	170,000	196,000
South Sumatra Islands	69,000	90,000	105,000	115,500	135,000	155,500	181,000	209,000
Bengkulu	60,000	90,000	105,000	115,500	127,500	146,500	150,000	173,000
Lampung	73,500	90,000	105,000	114,000	126,000	145,000	160,000	192,000
Jakarta	90,000	114,000	138,000	156,000	172,500	198,500	231,000	286,000
West Java I	66,000	114,000	138,000	156,000	172,500	198,500	230,000	286,000
West Java II	66,000	114,000	138,000	142,500	157,500	181,000	210,000	245,000
West Java III	66,000	114,000	138,000	132,000	145,500	167,500	200,000	230,000
West Java IV	66,000	114,000	138,000	129,000	139,000	160,000	195,000	225,000
Central Java	60,000	81,000	90,000	102,000	113,000	130,000	153,000	185,000
Yogyakarta	48,000	66,000	85,500	96,000	106,500	122,500	130,000	194,500
East Java I	63,000	90,000	111,000	120,000	132,500	152,500	182,000	236,000
East Java II	63,000	90,000	111,000	117,000	127,500	146,500	174,000	212,000
East Java III	63,000	90,000	111,000	111,000	121,000	139,000	166,000	208,000
East Java IV	63,000	90,000	111,000	108,000	116,500	134,000	160,000	202,000
Bali I	75,000	99,000	117,000	127,500	141,500	162,500	187,000	214,300
Bali II	75,000	99,000	117,000	127,500	141,500	162,500	166,000	190,300
West Kalimantan	67,500	90,000	105,000	114,000	126,500	145,500	175,000	228,000
Central Kalimantan	70,500	82,500	111,000	124,500	138,000	158,500	195,000	285,000
South Kalimantan	68,250	90,000	105,000	114,000	125,000	144,000	166,000	200,000
East Kalimantan	72,000	97,500	126,000	138,000	153,000	176,000	194,000	233,000
South Sulawesi	52,500	69,000	93,000	102,000	112,500	129,500	148,000	200,000
Central Sulawesi	52,500	69,000	84,000	96,000	106,500	122,500	150,000	203,000
Southeast Sulawesi	63,750	84,000	100,500	109,500	121,000	139,000	160,000	210,000
North Sulawesi	60,000	81,000	97,500	108,000	118,000	135,500	155,000	186,000
West Nusa Tenggara	54,000	70,500	88,500	97,500	108,000	124,000	145,000	180,000
East Nusa Tenggara	63,000	75,000	87,000	96,000	106,500	122,500	143,000	184,000
Molucca	69,000	93,000	114,000	123,000	136,000	156,500	180,000	
West Papua	105,000	135,000	142,500	154,500	170,000	195,500	225,000	315,000

Comments and Discussion

Susan Collins: In this paper Ann Harrison and Jason Scorse revisit from a new perspective the controversial question of whether globalization erodes labor standards. Using panel data, the authors examine determinants of whether firms comply with minimum wage regulations in Indonesia. The empirical analysis makes use of the annual manufacturing survey for 1990–99, which provides considerable detail about firm characteristics and behavior.

The authors find that foreign-owned firms are more likely to comply than domestic firms. Interestingly, the compliance probability for domestic exporters appears to have increased over time, which, the authors hypothesize, reflects the impact of international pressures to improve labor standards. By the end of the sample period, Indonesian firms that export have become more likely to comply than nonexporting domestic firms. These results are statistically significant and quite robust. Thus the authors conclude that there is no evidence of a race to the bottom or that globalization is eroding labor standards.

This paper has many strengths. In particular the empirical analysis is done carefully and generates results that are plausible, though provocative. The authors have explored many suggestions and issues raised regarding an earlier draft of their paper, enabling them to dispel some initial criticisms. The richness of the data used and details of the Indonesian experience make this an unusual and interesting episode to examine. In particular there is considerable variation in Indonesia's minimum wages, both over time and across regions in any given year.

As already stated, I find the basic results in the paper both plausible and interesting. However, I would argue that the authors sometimes push their preferred interpretation (that this is evidence against globalization eroding labor standards) too far. My comment discusses this point from a variety of perspectives. I suggest some dimensions of minimum wage compliance that, in my view, warrant further analysis and would enrich our understanding of the Indonesian experience.

There is considerable evidence in the existing literature, based on studies for a range of different countries, that both foreign-owned firms and domestic exporters tend to pay higher wages.[1] From this perspective, the finding here (that such firms are less likely to pay below the minimum wage) is not at all surprising. Indeed, after controlling for a fuller set of plant-level characteristics, the authors note that their results "provide an explanation why multinationals and exporters are more likely to pay the minimum wage: they are more capital intensive, highly productive enterprises whose workers are more highly paid." Furthermore, when the authors control for capital intensity and other plant characteristics, they find exporters are less likely to comply than nonexporting domestic firms. Given these results, it is surprising to see the authors' suggestion in their paper's conclusion that encouraging export orientation or foreign ownership may be a way for policymakers in Indonesia to raise compliance with minimum wage laws.

The authors focus on export orientation and foreign ownership as indicators of the extent to which firms are subject to global pressures. Appropriately, they have explored alternative versions of these measures. Their earlier work defined continuous variables and linked annual changes in these measures to compliance. This raised concerns such as reverse causation. In the current version, *EXP* and *FOR* simply distinguish firms with high global exposure from those with low global exposure. The fact that the results are robust to these specification changes is reassuring.

However, the estimation results presented in the paper do not address the bigger underlying concern that *EXP* and *FOR* are endogenous. This concern is exacerbated by defining *EXP* and *FOR* as firm-specific indicators, which may act as proxies for other firm-level characteristics that are not included among the regression's explanatory variables. If these omitted firm characteristics are positively correlated with the wage the firm would choose to pay, then the coefficients on *EXP* and *FOR* will overstate the true effects of

1. See Brown, Deardorff, and Stern (2003) for a recent survey.

globalization on compliance. The analysis at the paper's end, which controls for plant-level productivity, does begin to address this concern. Interestingly, *FOR* remains positively and significantly related to compliance. And the authors do state that they have addressed the potential endogeneity problem using instrumental variables in other work. Additional detail here would be useful, as this is important to convince one of the interpretation the authors give to these coefficients.

The authors suggest that pressures from human rights activists, both internal and external to Indonesia, help to explain the estimated trend increase in compliance by domestic exporters. (However, if such pressure was effective in increasing compliance of domestic exporters, I would have expected it to have an even greater effect on foreign-owned firms. In this context, I find puzzling the fact that the authors find no econometric evidence of increasing compliance among foreign-owned firms over time.) The paper clearly documents that these pressures did rise during the decade, and that compliance did increase, particularly for exporters, from the middle to the end of the decade. But while I am willing to believe that these pressures played some role, it seems to me that a strong case for this linkage requires a more careful look at the timing of developments than the authors provide. In fact the compliance data provided in the paper suggest a stronger role for an alternative factor that received little attention in the authors' analysis: the evolution of the real value of minimum wages. To make these points, it is useful to summarize the trend behavior of average minimum wages. I focus here on production workers only.

The paper's figure 7 shows average compliance each year for domestic firms, distinguishing between exporters and nonexporters. Broadly speaking, the two groups exhibit a similar pattern, with compliance always higher for exporters than nonexporters. During 1990–93, compliance is relatively high (over 70 percent of exporting firms and roughly 55–65 percent of nonexporting firms). Compliance drops sharply in 1994, and slightly more in 1995, to about 55 percent for exporters and 35–40 percent for nonexporters. It begins to rise for both groups during 1996–97, followed by greater increases in the final years of the decade. By 1999 over 70 percent of exporters again comply with minimum wage laws, comparable to the 1991–93 period, but still below the 1990 level. Just over 50 percent of nonexporters complied in 1999, still somewhat below the levels from 1990–93.

Can the timing of increased labor rights activism help to explain these trends? In terms of internal pressures, the paper notes that several labor

unions were formed in Indonesia in the early 1990s. Externally, we are told, U.S. groups filed a complaint under GSP in 1992 (and previously, in 1987). The paper also provides information about articles in major newspapers. The paper's figure 3 shows that articles about sweatshops surged in 1995–96, while figure 4 shows that Indonesia-specific articles about labor issues (sweatshops and child labor) soared in 1996. Thus the 1995–96 increase in compliance may have been responding to pressures from the newspaper coverage. But recall that this increase was quite modest. Perhaps this altered external environment set the stage for the greater 1998–99 rise in compliance. But the compliance decline in 1994 (after the introduction of new local unions) is not easily reconciled with developments in human rights pressures identified in the paper. Clearly, there are additional factors at work.

Firm compliance would be expected to vary inversely with the real minimum wage, which suggests one possible factor. A casual look at trends in the annual average minimum wage deflated by the CPI suggests this may indeed have played a central role in firm compliance.[2] This series rises slowly during 1990–93, as increases in the nominal minimum exceed price inflation. The real value of the minimum wage then jumped by nearly 25 percent in 1994, remaining high through 1997. However, a surge in inflation in 1998 then pushed the real value of the average minimum wage back to its 1993 level. These developments closely match both the 1994 decline and 1998–99 rise in firm compliance described above. It would be interesting to undertake a more formal analysis that attempted to link compliance with labor rights pressures (perhaps using data on newspaper coverage), and controlling for additional factors such as the evolution of the real minimum wage.

The discussion above focuses on the behavior of the average minimum wage over time. The average masks surprisingly large differences across regions. As pointed out by Vivi Alatas and Lisa Cameron, "this gives rise to arbitrary differences in the legal minimum between firms that are geographically close but on different sides of provincial borders. A particularly striking difference in minimums occurs within the bounds of Greater Jakarta (which is the manufacturing hub of Indonesia), part of which is in the

2. The annual average minimum wage data were supplied by the paper's authors. This series was deflated by the CPI (obtained from International Monetary Fund, *International Financial Statistics*) to construct the real minimum wage for Indonesia. The resulting annual index from 1990 to 1999 (1995 = 100), is 60, 66, 69, 74, 92, 100, 100, 104, 75, 72.

Table 6. Minimum Wages by Province, 1988–99

Rupiah/month

Province	*1988*	*1992*	*1995*	*1996*	*1997*	*1998*	*1999*
Jakarta	48,000	75,000	13,8000	156,000	172,500	198,500	231,000
West Java I	22,500	54,000	13,8000	156,000	172,500	198,500	230,000
West Java II	22,500	54,000	13,8000	142,500	157,500	181,000	210,000
West Java III	22,500	54,000	13,8000	132,000	145,500	167,500	200,000
West Java IV	22,500	54,000	13,8000	129,000	139,000	160,000	195,000

Source: Data provided by Harrison and Scorse.

province of Jakarta and part in the neighboring province of West Java."[3] Table 6 shows the minimum wage for Jakarta and the four West Java provinces in selected years from 1988 to 1999. In 1988 the Jakarta minimum was more than twice that in West Java, but by 1995 these had been equalized. However, considerable variation reemerged in 1996, with the minimum actually declining in two of the more rural parts of Java and rising in the parts closer to Jakarta. By the end of the decade, there was an 18 percent gap between the highest and lowest of these minimums. These figures suggest that the political economy of how these provincial minimums are set would be complex and interesting. A closer look at these issues would provide a more nuanced story about firm compliance. This discussion also suggests that provincial minimum wages should be treated as endogenous variables in the econometrics.

The cross-section variation in minimum wages is clearly exploited by the panel nature of the paper's empirical analysis. But it would have been interesting to push this analysis further and explore hypotheses about the concentration of noncompliant firms. For example, what accounts for the increase in noncompliance during the mid-1990s? Is it primarily explained by firms that are temporarily out of compliance, such as those in provinces with sharp minimum wage increases that take a year or two to raise their own wages accordingly? Or is it mainly because a subset of firms persistently pay wages below the legal minimum?

In sum, Harrison and Scorse have provided a useful look at the determinants of compliance with minimum wage laws in Indonesia during the 1990s. Not surprisingly, multinationals are consistently more, not less, likely to comply. And their likelihood of compliance does not seem to have

3. Alatas and Cameron (2003, pp. 2–3).

increased despite dramatically increased attention to labor rights in Indonesia by international activists. Controlling for plant characteristics, domestic exporters were initially less likely to comply. But their compliance did seem to rise over time, perhaps responding to such pressure. This is interesting and provocative. To really pin down the role of such international pressures will require further work that reflects, among other things, the complex interaction between the political economy of minimum wage setting and additional details about the timing of various developments. This most likely will entail some case study analysis across provinces to complement the econometric work. I look forward to seeing additional pieces in the story uncovered.

Kimberly Ann Elliott: Ann Harrison and Jason Scorse have written a very interesting and provocative paper exploring the linkages among globalization, labor standards, and the potential impact of the antisweatshop movement on Indonesian workers. Contrary to concerns expressed by antisweatshop activists, Harrison and Scorse find little evidence of a race to the bottom arising from globalization—and none at all in the targeted textile, apparel, and footwear sectors. But contrary to the concerns expressed by supporters of globalization, neither did the authors find that increased wages, perhaps spurred by activist pressures, negatively affected employment. As someone who likes to use the metaphor of Siamese twins to describe the relationship between globalization and labor standards, I find this is a gratifying result.

Using plant-level data from Indonesia's annual manufacturing survey, the authors analyze whether foreign-owned and exporting plants were more or less likely than domestic plants to comply with Indonesia's legal minimum wage during the 1990s, a time when the minimum wage doubled in real terms. The general results are similar to those in numerous other papers (including some by Harrison), which find that foreign-owned firms in developing countries pay more, on average, than local firms supplying the local market. Like many other studies, this paper also finds that most of the difference can be explained by higher capital intensity, the need for relatively higher skills, and other plant- and sector-specific characteristics. Thus they conclude that multinational corporations are not encouraging a race to the bottom by squeezing wages in poor countries.

The story gets more interesting and less conventional when Harrison and Scorse look at exporting firms. After controlling for worker and plant-

specific characteristics, the authors find that in the early and mid-1990s, firms with substantial exports were less likely to comply with the minimum wage law than similar plants that did not export. But Harrison and Scorse also show that exporter compliance increased over the decade, even as the real minimum wage was rising, and that compliance was actually better and increased even faster in the textile, apparel, and footwear sectors.[1] They hypothesize that the increasing compliance in the latter half of the 1990s might be explained by pressures from the U.S. government and transnational activists.

To explore whether higher minimum wages and improved compliance contributed to increased unemployment, Harrison and Scorse do a difference-in-differences analysis of changes in employment across different Indonesian sectors. Contrary to the fears of many globalization enthusiasts about the negative effects of external pressure and activist demands for higher wages, the authors find that relative to other sectors, employment growth was higher in foreign-owned and exporting plants, especially in the textile, apparel, and footwear sectors.

These are intriguing results. But there are other extensions of the research that could go further in answering the questions raised in the paper. First and most obvious, the authors have demonstrated only a correlation between increasing compliance with minimum wages and increasing external pressure (as measured by news stories on sweatshops and child labor). It would be useful to directly test the hypothesis of a causal relationship by gathering information on foreign owners or exporters that sell to buyers that are members of one of the multistakeholder code of conduct initiatives, which require independent monitoring of compliance. This analysis might be possible, at least for a subsample of these firms, because some factory-specific information (including addresses) is available on the company's own website or that of one of the multistakeholder initiatives, such as Social Accountability International and Fair Labor Association. For example, as a result of pressure from the group United Students Against Sweatshops, many colleges and universities now require licensees that produce school-logo apparel and other items to disclose contact information for all of their suppliers.

Second, in an earlier version of the paper, the authors provided a breakdown by gender for some of the worker characteristics (educational attain-

1. They find no change in the probability of compliance by foreign-owned firms.

ment). It would be interesting to test whether this information could be used to explore whether there are any differences in gender discrimination among the various types of firms. Are foreign-owned firms or exporters any more likely than local firms to hire or promote women to nonproduction jobs? Does the gender composition of employment, after controlling for sector-specific differences, affect the likelihood of compliance with minimum wages by various types of firms?

This last extension could also address criticisms that the paper claims too much. The motivation of the paper is to explore the assertion that globalization is contributing to a race to the bottom in compliance with labor standards. But the paper addresses only one such standard—minimum wages—and that standard is not among the core labor standards accepted by international consensus as appropriate for universal application.

The core standards, as defined by the International Labor Organization (ILO) are: freedom of association and the right to collective bargaining; elimination of forced labor; abolition of child labor; and nondiscrimination in employment. It is not clear that Harrison and Scorse's results on minimum wages tell us anything about compliance with these other standards. Such evidence as exists from the ILO, multistakeholder monitoring, and other sources suggests that firms that are in compliance with minimum wage laws probably do not use child labor or forced labor.[2] But there is no reason to think that such firms necessarily comply with nondiscrimination norms or respect freedom of association, and there is at least anecdotal evidence to the contrary.

Finally, the authors mention but do not discuss the results of an extension of the research that looks at the implications of labor standards for firms' exit decisions. If there is a tendency for foreign firms to exit as labor standards rise, this would seem to be evidence of race to the bottom from pressures of globalization—and it may not be a race to the bottom from the top or a race to the bottom across the board. Rather it may be a race to the bottom from the bottom, among similarly situated developing countries and, in particular, in low-wage, highly price-competitive, and internationally mobile sectors like apparel and footwear. This conclusion might be undermined by the results on rising employment, including in

2. For an overview of the global status of compliance with each of the four core standards, see International Labor Office (2000, 2001, 2002, 2003). For a brief summary and other references, see Elliott and Freeman (2003, chap. 1).

the textile, apparel, and footwear sectors. But this could be a short-term effect, and so results on firm exit would also be enlightening on these issues.

In the case of Indonesia at the end of the sample period, one also has a new (admittedly weak) democracy, which is trying to raise labor standards and, importantly, relax restrictions on freedom of association and collective bargaining rights. In this context, Harrison and Scorse's comment that Nike is planning to move many of its factories from Indonesia to lower-wage Vietnam, purportedly because of the latter country's greater political stability, is disturbing. Shunning an emerging democracy in favor of an authoritarian regime that bans independent unions may make perfect business sense, but it also has the whiff of a race to the bottom.

Discussion: The discussion focused mostly on the interpretation of the empirical results reported in the paper. Tom Palley reiterated Susan Collins's point that it would be better if the paper's focus was stated as minimum wage compliance rather than globalization or the race to the bottom. Palley also raised what he thought were anomalies in some of the regressions. The log of the minimum wage enters with a positive and significant coefficient in some cases, while the compliance model says there should be lower compliance when the minimum wage goes up. The coefficient on multinational presence goes away when labor force characteristics are controlled for, which seems to weaken some of the conclusions at the end. Ransford Palmer expressed surprise that there was no labor union variable in the model. Where unions are strong, wage rates and compliance are likely to be higher.

Robert Blecker wondered how well the paper is able to address the race to the bottom issue with the kind of data and methods that are being used here. There are some fairly obvious reasons why one would expect exporting firms and firms with foreign investment to pay higher wages. The race to the bottom argument relates to the idea that if you comply with minimum wage legislation, the investment may move to Vietnam, China, or some other place. The paper does not look directly at this. While there may be problems in getting data on this, one might want to look at global market shares and the extent to which firms in Indonesia are competing with firms in other locations, where standards are lower. Blecker also wondered if the results might be capturing an exchange rate effect, as the rupiah is sharply devalued in the sample period. This may have increased the compliance of

exporting firms over time, since Indonesian exports have become much more competitive as a result of the devaluation.

Penny Goldberg commented that the paper missed out on one angle of the race to the bottom argument, namely the claim that firms that are exposed to import competition may outsource activities to small firms or hire temporary workers who are paid much less than the minimum wage. Suppose big multinational or export firms continue to pay high wages, but outsource the low-skill activities to small firms as a response to increased import competition. The analysis in this paper would miss this completely, and the firms that engage in this practice would appear to have higher wages. One way to pick up this potential effect is to look at what happens to the really small firms in the sample, as presumably these are the ones that pay lower wages. Goldberg also questioned whether the average wage might be picking up increased dispersion. For example, if managers' salaries rise significantly while some people get paid way below the minimum wage, the average may go up while those at the bottom of the wage distribution are worse off. Looking at compliance levels for those with the lowest educational qualifications may help pick this up.

Thea Lee said that as a practitioner of anticorporate global activism she found the paper puzzling. She did not think the argument was that foreign companies or exporters are more likely to violate labor standards than domestic or nonexporting companies. She felt that the issue is a different one, namely that in a dynamic and competitive global economy without any minimum standards for labor rights, the competition between governments and, to some extent, between companies will sometimes take the form of labor sweating—and that is bad for workers in both poor and rich countries. By contrast, we have minimum standards for a lot of corporate issues, such as intellectual property rights, investment regulation, or financial services. Moreover, focusing on compliance with the minimum wage is really an odd choice for the international labor standards debate, because there is really very little emphasis on enforcing minimum wages or raising minimum wages through trade agreements in the WTO. It is really all about freedom of association. One sees countries repress labor unions in order to keep wages down and attract direct foreign investment. The competition between Honduras and El Salvador, or between China and Mexico, is dragged down by one bad player. China's total repression of independent labor unions, as well as the country's huge size and low wages, cannot be ignored by other developing countries, since they inevitably compete with China. If workers

had the right to form a union in any country, then multinational corporations would not be able to look for places where workers have the fewest labor rights.

Aart Kraay expressed concern that the result about foreign firms being more likely to comply may be driven by unobserved characteristics of foreign firms that make them pay higher wages. While there are controls for observable determinants of productivity in the regressions, at some level productivity is fundamentally unobservable. Related to that, there is the well-known result that foreign firms tend to cherry pick domestic firms with better skills. Or another mundane reason is that foreign firms may be more likely to hire expatriate workers who drive up the average wage of the firm. In this connection, it is surprising that the initial coefficient for exporters in the first year is negative, since there is quite a bit of evidence that exporting firms tend to be more productive. Kraay also wondered about alternative explanations for the finding. It could be that exporting firms enjoyed more rapid productivity growth during the 1990s than nonexporting firms. Or it could be that the minimum wage simply rose less slowly than the desired distribution of wages that firms are willing to pay. The latter could also explain the puzzling positive coefficient on the minimum wage.

Dani Rodrik suggested that the problems with the constructed compliance rate could be overcome by looking at changes in employment. If there are two different types of firms, one of which feels the minimum wage more binding than others, one ought to be able to see it in the employment responses to changes in the actual minimum wage. The timing of changes in the minimum wage may allow a simple difference-in-differences analysis to check whether exporter or MNE firms have differentially more negative employment responses to rises in the minimum wage. Sylvia Ostry summarized findings from her research on recent developments in the anticorporate globalization movement and pointed out that concern on the race to the bottom in clothing and textiles seemed to be largely an American, not European, phenomenon.

In her response, Ann Harrison replied briefly to some of the concerns that had been raised. She disagreed with Thea Lee and argued that the wage behavior of exporters and MNCs remained a point of contention. She also thought that focussing on compliance with the minimum wage was appropriate, since otherwise labor standards remain a nebulous concept. With respect to the questions about the minimum wage switching signs in various tables, she pointed out that the reason is that the sample goes from ten years

of data to three years of data. The difference in the signs between columns is not statistically significant.

Ann Harrison agreed that looking at outsourcing was important. She also agreed that the higher compliance of foreign firms in fact is due to characteristics not picked up in the first set of regressions. When controls for firm characteristics are introduced, foreign firms are no more likely to comply than other firms with the same characteristics.

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