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Does Compliance Pay? Social Standards and Firm-Level Trade

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Abstract: *What is the relationship between trade and social institutions in the developing world? The research literature is conflicted: Importing firms may demand that trading partners observe higher labor and environmental standards, or they may penalize higher standards that raise costs. This study uses new data on retailers and manufacturers to analyze how firm-level trade responds to information about social standards. Contrary to the "race to the bottom" hypothesis, it finds that retail importers reward exporters for complying with social standards. In difference-in-differences estimates from over 2,000 manufacturing establishments in 36 countries, achieving compliance is associated with a 4% [1%, 7%] average increase in annual purchasing. The effect is driven largely by the apparel industry—a long-term target of anti-sweatshop social movements—suggesting that activist campaigns can shape patterns of global trade.*

Replication Materials: The data, code, and any additional materials required to replicate all analyses in this article are available on the *American Journal of Political Science* Dataverse within the Harvard Dataverse Network, at: https://doi.org/10.7910/DVN/2E2M9Z.

International trade shapes not only economic growth but also the social institutions of trading countries. A research literature in political economy, going back at least to Marx's argument that free trade accelerates exploitation of labor and the collapse of capitalism (Engels 1888), debates both the mechanisms and direction of its impact. Contemporary scholarship has explored how international trade shapes taxation (Garrett 1998), social spending (Ansell 2008; Rickard 2012; Rodrik 1998; Rudra 2008), health and environmental regulations (Drezner 2001; Vogel 1995), and labor rights (Greenhill, Mosley, and Prakash 2009; Mosley 2010; Mosley and Uno 2007; Neumayer and De Soysa 2006; Rudra 2005).

This study contributes new evidence on one mechanism linking trade and social institutions: the market behavior of trading firms. If traders reward exporters that exhibit lower labor and environmental standards, their behavior creates downward pressure on these standards, contributing to a trade-led "race to the bottom." On the other hand, if trading firms prefer doing business with exporters that observe higher standards, they may create incentives for exporters to improve standards. These firm-level mechanisms are distinct from state-level mechanisms linking trade to social institutions. Yet previous empirical research focuses largely on aggregate national-level policies and labor market outcomes. The contribution of firm-level mechanisms is therefore unknown.

We investigate how the social standards of exporters correlate with firm-level trade. Examining retailers in advanced economies and several thousand manufacturers in emerging markets, we detect surprising evidence of a preference for exporters that observe higher standards. Importers purchase more from export factories that comply with basic labor and environmental standards,

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contrary to what we would expect from a firm-level race to the bottom. Difference-in-differences estimates show that within-exporter improvements in compliance are associated with increased average order volume of 4% [1%, 7%], even after adjusting for variation in manufacturing performance. These findings suggest that in the markets we study, either (a) compliance with basic labor and environmental standards can be achieved without sacrificing performance on price, delivery, or product quality, or (b) some importers are willing to pay more to trade with socially compliant exporters.

The study cannot conclusively adjudicate between these interpretations. However, noting that the importers we study are primarily retailers and apparel brands headquartered in advanced economies, we propose that anti-sweatshop social movements may have prompted them to prefer purchasing from factories that comply with basic social standards. Consistent with this hypothesis, we find that the relationship between compliance and sourcing appears primarily in apparel, an industry targeted by anti-sweatshop activism over the last three decades. Yet enforcing basic standards through this mechanism has clear limitations. A majority of the studied exporters remain noncompliant with basic standards. Despite evidence of a firm-level preference for compliance, this incentive falls far short of guaranteeing basic labor and environmental standards in global supply chains.

In addition to the research literature on trade and social standards, this study contributes to long-standing debates surrounding the efficacy of "private regulation" or "civic regulation" of multinational business (Bartley 2007; Elliott and Freeman 2003; Locke 2013; Mattli and Büthe 2005; Mayer and Gereffi 2010; O'Rourke 2003; Vogel 2008). Private regulation refers to nonstate systems of monitoring and enforcement of standards. As these institutions have become increasingly prevalent, scholars have debated the extent and conditions under which private regulation can supplement or even replace regulation by the state. Early scholarship suggested that private regulation—supported by consumer and activist pressure—could drive higher standards in trading jurisdictions that fell outside the reach of trade unions and effective regulatory agencies (Elliott and Freeman 2003; Fung, O'Rourke, and Sabel 2001). Yet subsequent empirical research cast doubt on the efficacy of private regimes, finding that major labor and environmental violations persisted in exporters subject to private regulation (Distelhorst et al. 2015; Locke, Amengual, and Mangla 2009; Locke, Qin, and Brause 2007; Seidman 2007; Vogel 2005).

Although previous research shows that many exporters fail to achieve compliance with international codes of conduct, it is less informative about the economic incentives created by transnational private regulation. Do these incentives reward improving or declining standards? Our study affirms that many noncompliant factories participate in global supply chains, yet our findings also suggest that economic incentives within these supply chains generate upward pressure on standards. Within an industry subject to pressure from anti-sweatshop activism, exporting firms are on average rewarded rather than punished for improving compliance with labor and environmental standards. The concluding section discusses the magnitude of this effect and the investments in socially responsible practices it might offset.

Trade-Based Diffusion of Social Institutions

The political economy literature is conflicted about the effects of trade on worker rights and environmental protection. Some theories hold that pressures from international competition undermine costly protections for both workers and the environment in a race to the bottom. Others suggest that international trade leads to upward harmonization on standards, resulting in "California effects." Yet uncertainty surrounds not only the direction of trade's impact, but also the mechanisms that produce these effects.

To date, a significant body of research focuses on country-level mechanisms and outcomes. Falling tariffs may foster competition between national economies that extends to regulatory regimes. If domestic regulations impose cost disadvantages on industry, governments may reduce regulation to protect domestic tax revenue and employment (Drezner 2001). Several country-level empirical studies find that trade openness undermines worker rights and bargaining power, especially in developing countries (Mosley and Uno 2007; Rodrik 1997; Rudra 2005, 45–46). Yet alternative measurement and identification strategies find either no relationship or the opposite effect (Neumayer and De Soysa 2006; Vadlamannati 2015).

Another body of research notes that trade liberalization is often accompanied by a negotiated harmonization of regulatory standards. When powerful states also have higher standards, they may impose those standards on their trading partners, leading to upward harmonization through trade liberalization (Vogel 1995). Indeed, since 1950, roughly two-thirds of all preferential trade agreements include provisions on social institutions, including labor rights, environmental protection, and human rights

(Hafner-Burton 2005; Milewicz et al. 2016). Country-level research on trade also offers evidence of these California effects in both labor rights (Greenhill, Mosley, and Prakash 2009) and human rights (Cao, Greenhill, and Prakash 2013).

Firm-Level Mechanisms

The mechanisms discussed above function at the country level through changes in policy. Yet the market behavior of trading firms—rather than governments—may generate similar pressures on labor and environmental practices. Managers decide which firms they do business with, how to compensate workers, and how to dispose of the waste they generate. The effects of trade therefore depend not only on how governments behave, but also on whether firms that observe higher regulatory standards are rewarded or penalized by global markets.

One possibility is that firms that observe higher standards—like offering higher wages or paying to mitigate their environmental impacts—are at a competitive disadvantage in export markets. This view rests on two assumptions. The first assumption is that, other things equal, observing higher labor and environmental standards results in increased unit prices. For example, if an exporting firm increases employee compensation to satisfy minimum wage regulations, it may pass increased labor costs to its customers in the form of higher prices. The second assumption is that customers (importers) are indifferent to the labor and environmental standards of their suppliers. They are unwilling to pay higher prices to do business with compliant exporters. Under these two conditions, we may observe a firm-level race to the bottom as exporters seek price advantages by reducing compliance with labor and environmental regulations (Chan 2003; Mosley and Uno 2007; Rodrik 1997; Weil 2014).

Alternatively, there is the possibility of firm-level California effects. Like states, trading firms may also have preferences about the processes through which the goods they import are produced. Activist campaigns are one possible driver of these preferences. Social movements promoting environmental sustainability and combatting worker exploitation attract consumer attention and threaten the value of targeted firms (Bartley 2007; Elliott and Freeman 2003; Fung, O'Rourke, and Sabel 2001; King and Soule 2007; Seidman 2007; Vogel 2005). Reputation-conscious importers may therefore prefer to do business with exporters that comply with minimum standards in labor and environmental practices. This firm-level preference would allow trade to drive higher standards in the absence of any government action.

The emergence of transnational private regulation of global supply chains offers suggestive evidence for this possibility. Activist campaigns around labor and environmental abuses have prompted many consumer-facing multinational enterprises to establish "supply chain responsibility" programs (Bartley 2007; Levi et al. 2013; Locke 2013; Mayer and Gereffi 2010; Toffel, Short, and Ouellet 2015; Vogel 2005, 2008). This typically entails establishing codes of conduct that govern working conditions, environmental practices, and other international standards. Exporters seeking to do business with these multinationals must agree to these standards and submit to periodic audits. Private regulation of supply chains has spread from apparel and footwear to varied industries including consumer electronics (Distelhorst et al. 2015; Nadvi and Raj-Reichert 2015), food and beverages (Coslovsky and Locke 2013), and forestry (Bartley 2007).[1] Unlike Fair Trade certification (De Janvry, McIntosh, and Sadoulet 2015), these compliance programs seek primarily to alter the production processes of exporters, not necessarily increase their profits.

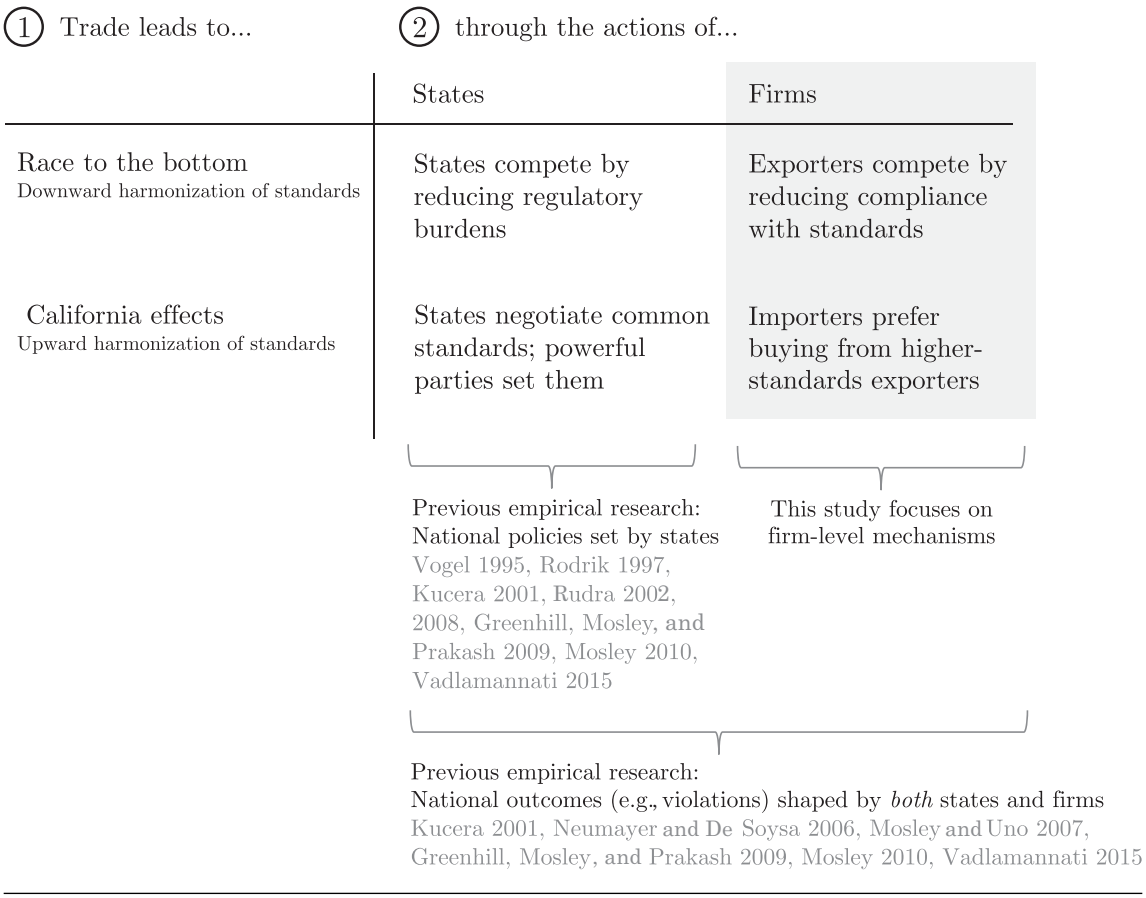
In comparison to the research literature on trade and social institutions at the country level, there is markedly less evidence on firm-level mechanisms (Figure 1). The studies discussed in the previous section primarily use cross-national data sets developed by Mosley (2010) and Kucera (2001) to measure the prevalence of labor rights violations aggregated at the national level. These outcomes may be influenced by state-level mechanisms, firm-level mechanisms, or a combination of the two.

Although previous research does not offer quantitative evidence on firm-level mechanisms, scholarship on transnational private regulation casts doubt on its efficacy. Studies have repeatedly found that noncompliant export factories remain in supply chains even after multiple audits and corrective exercises (Distelhorst et al. 2015; Locke 2013; Locke, Qin, and Brause 2007).[2] Consistent with one assumption of the firm-level race to the bottom, these studies affirm that complying with higher process standards—paying statutory minimum wages and benefits, mitigating pollution impacts, and offering safe factory infrastructure—increases costs (Barrientos 2013; Lund-Thomsen and Lindgreen 2014;

[1] Although we have separated state-level and firm-level mechanisms in this discussion, private regulation does not operate in a regulatory vacuum. There are complementarities between transnational private regulation and domestic state-based regulation (Amengual 2010; Amengual and Chirot 2016; Coslovsky and Locke 2013).

[2] In contrast to most of the literature, Harrison and Scorse (2010) found that the Indonesian export industries most exposed to anti-sweatshop campaigns in the 1990s raised worker wages with no discernible impact on employment.

FIGURE 1 Hypothesized Mechanisms Linking Trade and Social Institutions



Mosley 2010; Ruwanpura and Wrigley 2011). Despite evidence that some consumers pay premiums for ethically produced goods (Hainmueller, Hiscox, and Sequeira 2015), this scholarship also affirms the second assumption, that importers are unwilling to pay more to do business with compliant factories: "It seems inevitable that higher labor standards will increase production costs, and many suppliers believe that addressing [social responsibility] issues makes them less competitive" (Vogel 2005, p. 95). Consistent with this view, reports by scholars, activists, and nongovernmental organizations continue to expose poor working conditions in export factories manufacturing for top retail brands, even when these factories are subject to codes of conduct and compliance auditing by their customers (Chan, Pun, and Selden 2013; Workers Rights Consortium 2014).

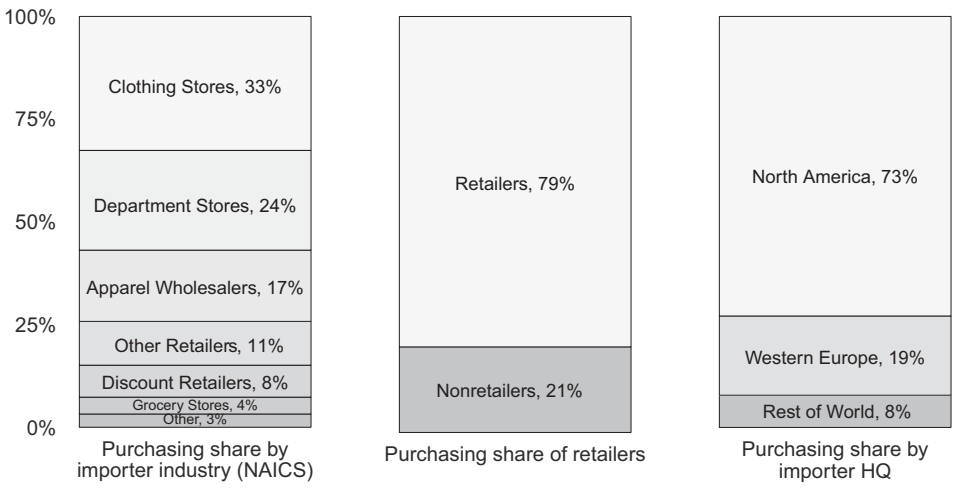
Despite the sensibility of these critiques, empirical evidence on firm-level trade and social institutions has been elusive. One noteworthy exception, Oka (2012), found that reputation-conscious importers rewarded compliance by Cambodian exporters with long-term sourcing relationships. However, this finding came from a unique institutional setting—the Better Factories Cambodia program[3]—raising questions about its generalizability to exporters that cannot or do not participate in such programs.

Research Design

If global supply chains exhibit a firm-level race to the bottom in labor and environmental standards, importers should place more orders with low-standards exporters. Yet there is also the possibility of firm-level California effects; if trading firms prefer doing business with exporters that comply with higher labor and environmental standards—and the effect of compliance on prices is either negligible or tolerable—we expect the opposite pattern.

[3]Better Factories Cambodia (http://betterfactories.org/) is a factory-monitoring and capability-building program managed by the International Labour Organization and the International Finance Corporation.

FIGURE 2 Importers Are Primarily Retailers in Advanced Economies



Note: Estimated distribution of importer industries and headquarter locations in sourcing agent data is shown. The figure is based on the top 200 importers in the sample, who account for an estimated 93% of import volume over 2009–12.

We test these hypotheses using a novel data set on export transactions involving several thousand establishments provided by a global sourcing agent.[4] Sourcing agents play an important role in global supply chains by connecting importers with exporters capable of producing goods at an acceptable price, quality level, and delivery schedule. The sourcing agent we study primarily serves retailers and wholesalers headquartered in advanced economies (Figure 2).

Contemporary sourcing agents not only facilitate transactions; they also monitor the compliance of exporters in the developing world with labor, environmental, and legal standards. In response to importer demand, the sourcing company established its own code of conduct, audited export factories for compliance with this code, and reported the results to prospective importers. We use these factory audits to measure exporter compliance with labor and environmental standards. Social compliance auditing has many well-understood problems. Audits only capture a snapshot of factory conditions, are only as good as the training of their auditors, and are poorly suited to evaluate and enforce process rights like the freedom of association (Anner 2012; Locke, Amengual, and Mangla 2009; O'Rourke 2003). Rather than assume that audits offer a flawless picture of factory conditions, this study adopts the more modest assumption that factories that exhibit higher compliance scores are also, on average, more compliant than those that exhibit lower scores. In the supporting information (SI), we examine detailed audit results to help readers understand what issues auditors actually detect and ensure our results are not driven by noncredible items like freedom of association or nondiscrimination. However, even if readers remain skeptical of this approach, these audits serve as the primary source of information available to potential importers about exporter labor and environmental practices. Audit results are therefore an appropriate measure of exporter compliance as perceived by importers.

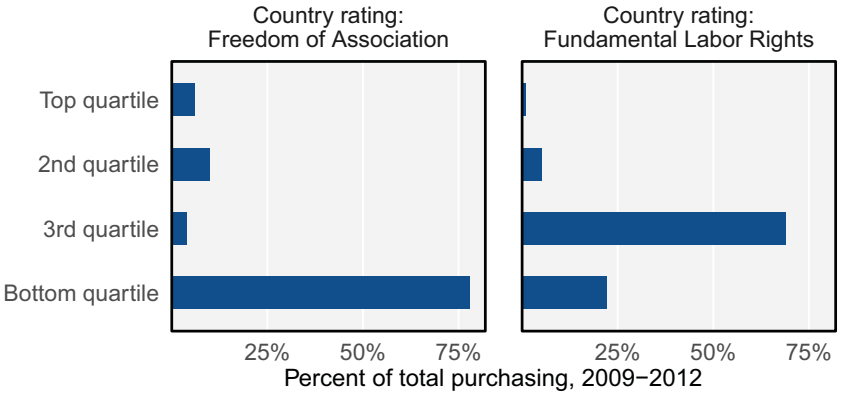
Auditors inspect factories over one to two days to evaluate their practices against the standards established in the code of conduct. They then assign the factory a letter grade on the scale A through D. The factories are also summarized in 13 separate compliance areas, such as "wages and benefits" and "work hours" (SI Table A1). Factories rated A and B (28% of the factory-year observations in the main panel) are considered compliant, whereas those rated C and D are noncompliant. Our analysis uses both the original 4-point grading system and this binary distinction between compliance and noncompliance, which eliminates the assumption of equidistance between the four letter grades.

The sourcing agency also provided data on the value of customer orders placed at each export manufacturer. These records were provided in annual sums and binned into 13 ranges, from under USD 50,000 to over USD 50 million.[5] The midpoint of each bin provides an

[4]The sourcing agent's data were obtained and analyzed under the terms of a research agreement. The agreement allowed the sourcing agent to mask its name and the names of its customers and supplier factories in any published research.

[5]The boundaries of the 13 annual order value bins were \$0, \$50k, \$100k, \$250k, \$500k, \$750k, \$1m, \$5m, \$10m, \$20m, \$30m, \$40m,

FIGURE 3 Importers Purchase from Countries with Poor Labor Rights



Note: Distribution of purchasing value by exporting country in sourcing agent data is shown. Freedom of association and labor rights country ratings are from the World Justice Project, 2012–13. Detailed purchasing by country is reported in SI Table A2.

estimate of the annual nominal value of buyer orders. These estimates are then deflated to obtain order value in constant 2012 dollars.[6] Within this sample, most exports come from countries with poor freedom of association and protection of labor rights (Figure 3).

In addition to annual order values and factory compliance data, the sourcing agent provided information on factories' locations, product types, delivery performance, and product quality. Descriptive statistics on all variables appear in SI Table A1. The export factory panel is composed of factories with valid compliance, order value, and manufacturing performance data in at least 2 years over 2009–12. The sourcing agent only records factory on-time delivery and quality performance in years that it places orders at that factory. Therefore, the main panel represents only a subsample of the entire population of exporting factories. To ensure that findings are not idiosyncratic to factories with manufacturing performance data, a second analysis examines all factories that appear in at least 2 years of the panel.

Studying trade and social institutions in this sample has both advantages and disadvantages. These exporter–importer transactions offer an appealing behavioral measure of the economic incentives surrounding labor and environmental standards: the decision by importers to place orders at factories. In contrast to previous studies examining worker rights outcomes at the national level, this analysis isolates mechanisms operating at the firm level. Factory compliance with standards is measured by inspections conducted by external auditors, rather then self-reporting by factory management through surveys. In addition, the panel structure of these data offers an opportunity to control for unobserved time-invariant features of factories and geographies. Finally, because the sourcing agent works with hundreds of importers, these empirical results also have improved external validity over the single-importer studies that dominate the existing literature on transnational private regulation.[7]

At the same time, this study is not a census of global supply chains. The importers studied are primarily retailers, and apparel manufacturers account for 58% of the exporter panel. This industry has been a target of anti-sweatshop campaigns, a fact we exploit when exploring mechanisms. However, this suggests that results are generalizable only to particular industries, not all global supply chains. In addition, confidentiality considerations led the sourcing agency to provide only annual order value at each factory. We therefore cannot decompose firm-level trade into quantities and prices. This constrains analysis of the economic implications of our findings, as discussed in the concluding section.

$50m, and over $50m. In addition to estimated annual order values, SI Table A5 reports fitted linear probability models of exceeding the thresholds defined by bin edges.

[6]Deflators for USD-denominated orders were obtained from the Bureau of Labor Statistics' Import Price Index series for "Consumer Goods, Excluding Automotives" (http://www.bls.gov/web/ximpim/beaimp.htm). Analyzing nondeflated nominal currency data does not significantly alter the results.

[7]One notable exception is Toffel, Short, and Ouellet (2015), who analyze factory compliance in a multi-importer context and find that pro-social attitudes and economic development in the home countries of importers are associated with improved factory compliance with social standards.

Table 1 Cross-Sectional Comparison of Compliant and Noncompliant Factories (2012)

	Compliant	Noncompliant	Difference	SE	p-value
Annual orders					
Order value (thousand USD)	$4,116	$2,504	−1,612	213	.000
Log order value	7.11	6.26	−.85	.07	.000
Factory location (binary indicators)					
China	.55	.63	.08	.02	.000
India	.11	.08	−.03	.01	.021
Bangladesh	.01	.08	.07	.01	.000
Indonesia	.04	.05	.01	.01	.076
Vietnam	.07	.04	−.03	.01	.001
Thailand	.02	.03	0	.01	.432
Turkey	.02	.02	0	0	.647
Philippines	.02	.01	−.01	0	.185
Taiwan	.04	.01	−.02	.01	.000
Cambodia	.01	.01	0	0	.506
Pakistan	.01	.01	0	0	.613
Other countries	.11	.03	−.08	.01	.000
Products (binary indicators)					
Clothing	.59	.47	−.12	.02	.000
Furniture and home decor	.20	.20	.00	.01	.862
Toys	.18	.17	−.01	.01	.598
Cookware	.10	.10	−.01	.01	.393
Others	.15	.24	.08	.01	.000
Factory size and performance					
Employees	677	581	−96	36	.008
On-time delivery (%)	.75	.71	−.04	.01	.000
Quality inspection (%)	.94	.91	−.03	0	.000
Total factories	981	3,328			
Share of sample	21%	79%			

Note: Standard errors and p-values are from two-sided t-tests assuming unequal variances. Note that there are more factories in this cross-sectional 2012 sample than the subsequent panel analysis, as the panel analysis excludes factories that appear only once in the 4-year panel. For regression analysis of order value using these variables as predictors, see SI Table A3.

Firm-Level Trade and Exporter Compliance

Do importers prefer exporters with higher or lower workplace standards? We find that compliant factories receive markedly more business than noncompliant factories (Table 1). In 2012, 21% were rated compliant in at least half of their audits (some factories are audited multiple times in a single year). On average, these factories received 64% greater order value than those rated noncompliant. Average buyer spending was USD 4.1 million in compliant factories, compared to USD 2.5 million in noncompliant factories. Adjusted for factory size, compliant factories received $6,080 in orders per employee, whereas noncompliant factories received $4,310.

The rewards for compliance appear large in this cross-sectional analysis. However, this comparison may not represent a credible estimate of the relationship between compliance and importer purchasing decisions. Table 1 also compares other qualities of compliant and noncompliant factories in 2012. They differ in many ways. Chinese, Bangladeshi, and Indonesian factories are more likely to be found in the noncompliant group. Compliant factories are more likely to manufacture clothing, employ roughly 100 (17%) more people on average, and exhibit superior quality and on-time delivery performance.

Fitting an ordinary least squares (OLS) model of order value using all variables in Table 1 as predictors

estimates smaller effects of factory compliance on orders: an increase of USD 926,000 (SI Table A3). This estimate is more credible than the previous comparison, but it cannot exclude the possibility that unobserved factory-level differences correlated with compliance levels are biasing effect estimates. For example, it seems likely that—even after controlling for factory size and performance in on-time delivery and product quality—compliant factories may also enjoy advantages in management practices, human capital, or technology that support superior productivity (Bloom et al. 2013).

To account for time-invariant differences (country, product type, ownership, etc.) across factories, we use the panel structure of the data to generate within-factories estimates of the effect of changes in exporter compliance status on importer purchasing behavior. The effect of compliance on orders is estimated by fitting a standard two-way fixed effects regression model, both with and without time-varying factory performance metrics.

$$Y_{it} = \eta_i + \delta_t + \beta_1 \,\text{Compliance}_{it} + \varepsilon_{it}. \tag{1}$$

$$Y_{it} = \eta_i + \delta_t + \beta_1 \,\text{Compliance}_{it} + \beta_2 \,\text{OnTime}_{it} + \beta_2 \,\text{Quality}_{it} + \varepsilon_{it}. \tag{2}$$

Each model is fit using both the binary measure of compliance and the annual average of the 4-point compliance score (A = 3, B = 2, C = 1, D = 0) as explanatory variables. The left-hand panel of Table 2 (columns 1–4) fits these models using the main factory panel summarized in SI Table A1. The center panel (columns 5–8) fits the same models on the subsample of factories that undergo changes in compliance status during the period studied.

Under the twin assumptions that compliance raises unit prices and that importers will not pay more to do business with compliant exporters, we expect that when factories raise standards, they should lose business. Instead, we observe the opposite pattern. Across both samples, achieving compliance is associated with an increase in purchasing. This effect holds whether compliance is measured using the raw 4-point audit score or the binary compliance simplification. Adding controls for manufacturing performance has almost no impact on effect magnitudes.

As noted above, not all factories have performance, sourcing, and compliance data in at least two years of the panel. The rightmost section of Table 2 therefore expands to include the larger panel of factories that have at least 2 years of compliance and purchasing data. The main effects strengthen when we expand the sample to include these factories (columns 9–10). In the final two columns, we further relax identification assumptions by adding factory-specific linear time trends to the model (i.e., introducing $j = 5,722$ linear time trend predictors corresponding to each factory in the panel).

$$Y_{it} = \eta_i + \delta_t + \beta_1 \,\text{Compliance}_{it} + \sum_{i=1}^{j} \gamma_i \,\text{Trend}_i + \varepsilon_{it}. \tag{3}$$

This model relaxes the parallel trends assumption in standard fixed effects models, as biases introduced by divergent linear trends across groups are captured by the factory-specific trends. To the extent that factory trends are correlated with any exogenous changes in factory compliance, they will erroneously bias estimates of the compliance toward zero. Columns 11 and 12 of Table 2 report point estimates that are positive and similar in magnitude to estimations from the main panel. However, these estimates are less precise, with 95% confidence intervals that include zero.

What is the economic significance of these effects? Table 3 reports effect magnitudes from the main panel estimates in both dollars and percent of annual order value. The models yield point estimates of increased order value ranging from USD 110,000 to 167,000 when an exporter transitions from noncompliant to compliant. This represents a 4% average increase in annual order value. These figures estimate annual purchasing using the midpoints of the annual purchasing bins provided by the sourcing agent. We also report linear probability models of exceeding various order thresholds in SI Table A5. These estimates find effects across several thresholds. For example, compliance is associated with a 4.8% increase in the probability of receiving more than $250,000 in annual orders. These analyses show that effects are not driven by the high-uncertainty purchasing bins at the top of the distribution, nor are they driven by one idiosyncratic transition between order bins.

The magnitude of the within-factories effect is modest, and our data also confirm that many noncompliant factories continue to operate in global supply chains. Nonetheless, we find evidence that importing firms in our sample prefer purchasing from export factories that comply with minimum labor and environmental standards.

Rewards and Penalties

Two incentive mechanisms may explain the effects detected above. First, importers may increase purchasing when factories achieve compliance, rewarding factories

TABLE 2 Panel Estimates of Effect of Compliance on Order Value (Logged USD, Thousands)

	Main Panel: Factories with Performance Data				Main Panel Subsample: Within-Factory Compliance Transitions				All Factories			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Compliance (binary)	.143	.143			.142	.139			.256		.126	
	(.048)	(.048)			(.048)	(.048)			(.055)		(.081)	
Compliance (A–D)			.093	.093			.095	.093		.161		.106
			(.035)	(.034)			(.036)	(.036)		(.039)		(.059)
On-time delivery		−.072		−.074		−.208		−.21				
		(.113)		(.113)		(.191)		(.19)				
Quality inspection		−.087		−.089		−.375		−.376				
		−0.19		−0.19		(.344)		(.343)				
2010 fixed effect	.016	.015	.018	.017	.197	.194	.201	.198	.093	.098	1.69	1.69
	(.051)	(.051)	(.051)	(.051)	(.069)	(.069)	(.069)	(.069)	(.036)	(.035)	(.059)	(.059)
2011 fixed effect	−.105	−.105	−.106	−.105	.087	.091	.086	.091	.284	.286	3.15	3.15
	(.059)	(.058)	(.059)	(.058)	(.081)	(.081)	(.081)	(.081)	(.040)	(.040)	(.071)	(.071)
2012 fixed effect	−.129	−.129	−.129	−.129	.140	.145	.143	.147	3.45	3.46	7.52	7.52
	(.062)	(.062)	(.062)	(.062)	(.084)	(.083)	(.084)	(.083)	(.070)	(.070)	(.015)	(.015)
Factory fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Factory time trends											✓	✓
Constant	6.6	6.8	6.5	6.7	6.9	7.4	6.8	7.3	2.8	2.6	3.8	3.7
	(.043)	(.193)	(.062)	(.196)	(.057)	(.359)	(.077)	(.360)	(.033)	(.06)	(.068)	(.097)
Observations	6,915	6,915	6,915	6,915	3,235	3,235	3,235	3,235	15,956	15,956	15,956	15,956
R-squared	.005	.005	.004	.005	.008	.010	.007	.009	.366	.365	.799	.799
Factories	2,447	2,447	2,447	2,447	1,028	1,028	1,028	1,028	5,722	5,722	5,722	5,722

Note: OLS panel fixed effects regression from 2009 to 2012 are reported. Models 1–4 fit using main panel of factories with performance data (Table A1). Models 5–8 fit on the subsample of the main panel that undergoes a transition in compliance status over the period studied. Models 9–12 fit on all factories that appear at least twice in the panel, with 5,722 linear time trends corresponding to each factory in Models 11 and 12. Standard errors clustered by factory appear in parentheses.

Table 3 Effects Magnitudes from Panel Estimates

	Model 1	Model 2	Model 5	Model 6
Point estimate (thousand USD)	$111	$110	$167	$164
95% CI lower	$31	$32	$55	$52
95% CI upper	$191	$190	$282	$278
Point estimate (% of mean order value)	4.21%	4.19%	4.42%	4.36%
95% CI lower	1.14%	1.15%	1.40%	1.35%
95% CI upper	7.39%	7.36%	7.53%	7.48%

Note: The table reports average effects of moving from noncompliant to compliant on annual order value, calculated from panel models estimated in Table 2. Percentages are based on mean order value among noncompliant factories in the sample. Distributions of effect magnitudes obtained through bootstrapping ($B = 1{,}000$) are reported.

for improvement. Second, they may reduce orders from factories that fall out of compliance, penalizing exporters whose standards decline.

We next divide factories into four groups within each 2-year period: compliant in both years, falling out of compliance, moving into compliance, and noncompliant in both years. Comparing the first two groups reveals penalties for falling out of compliance. Comparing the latter two tells us whether there are rewards for achieving compliance. The initial results of this analysis are visualized in Figure 4. The top panel shows the raw results, and the bottom normalizes each year by the within-year mean order value, which helps to visualize results from 2011–12 when overall orders increase for all groups. The figures suggest both negative incentives (penalties) and positive incentives (rewards) for complying with standards.

To reduce pretreatment differences between factory groupings, we then use entropy balancing (Hainmueller 2012) to reweight the samples to achieve balanced moments on a variety of covariates (SI Table A6). In the reweighted samples, factories that transition and maintain their compliance status exhibit identical distributions of factory locations, product types, and initial-period order values. In 2010–11 and 2011–12, we also include the prior-year purchase value trend to control for divergent trends predating the compliance transition. The graphical analysis in Figure 5 again shows relative declines for factories that fall out of compliance (compared to those that stay compliant) and relative gains for factories that achieve compliance (compared to those that stay noncompliant). Regression analyses of the unbalanced and balanced samples for each 2-year panel are reported in SI Table A7. The effect of rebalancing on effect magnitude is mixed, but the evidence across all estimations and years is consistent with positive incentives for factories that achieve compliance and (weaker) penalties for those that fall out of compliance.

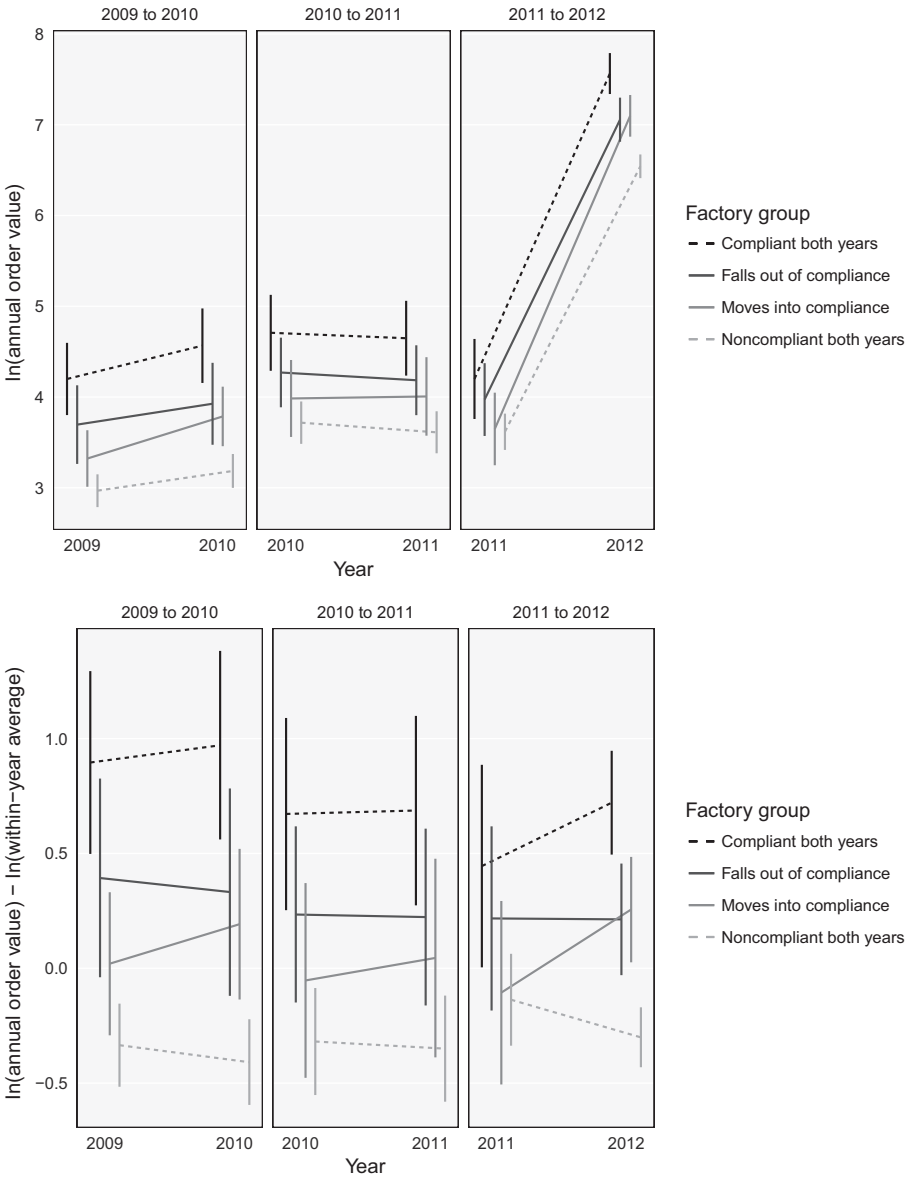
Which Industries Exhibit Compliance Effects?

The firms in this study include exporters in a variety of product categories. We use this variation to further test the plausibility of the results and explore possible mechanisms. One possible explanation of the patterns above is that importers use the compliance results to avoid the reputational risk of dealing with exporters engaged in socially harmful practices. Financial markets penalize firms for revelations of environmentally harmful activities, industrial accidents, and activist campaigns (Flammer 2013; King and Soule 2007). For consumer-facing firms like the retailers in our study, the perception that their suppliers exploit workers or cause environmental harm could have negative financial consequences.

Among the industries in this study, the global apparel industry has been more exposed to anti-sweatshop activism (Bartley and Child 2014). Other common product types like home furnishings (26% of exporters) and cookware (14%) have not been subject to similarly intense campaigns. If the mechanism generating our effects is the preference of certain importers to avoid noncompliant factories we expect effects to be strongest in industries targeted by activist campaigns. If our effects were driven instead by industries that are not subject to these campaigns, a different mechanism may be at work.

To explore this possibility, we estimate heterogeneous treatment effects by exporter industry. Table 4 shows that the only exporter industry in which effects are statistically different from zero is clothing. The effect magnitude of the binary compliance measure is roughly triple the next largest estimates, from toys and other products. This effect persists using both binary and continuous compliance indicators, and examining either the entire panel (columns 1 and 2) or the subset of factories that undergo compliance transitions (columns 3 and 4). This pattern is consistent with a mechanism in which importers

FIGURE 4 Order Values by Compliance Trajectory, Two-Year Panels



Note: Two-year panels of factory mean order value (logged thousand USD), sorted by factory compliance trajectories, are shown. From top to bottom, factories are either (a) compliant in both years; (b) compliant, then noncompliant; (c) noncompliant, then compliant; and (d) noncompliant in both years. Bottom panel subtracts within-year order value means to aid interpretation. Note that annual means vary by facet because each analysis includes only factories with observations in both years. Error bars show 95% confidence intervals.

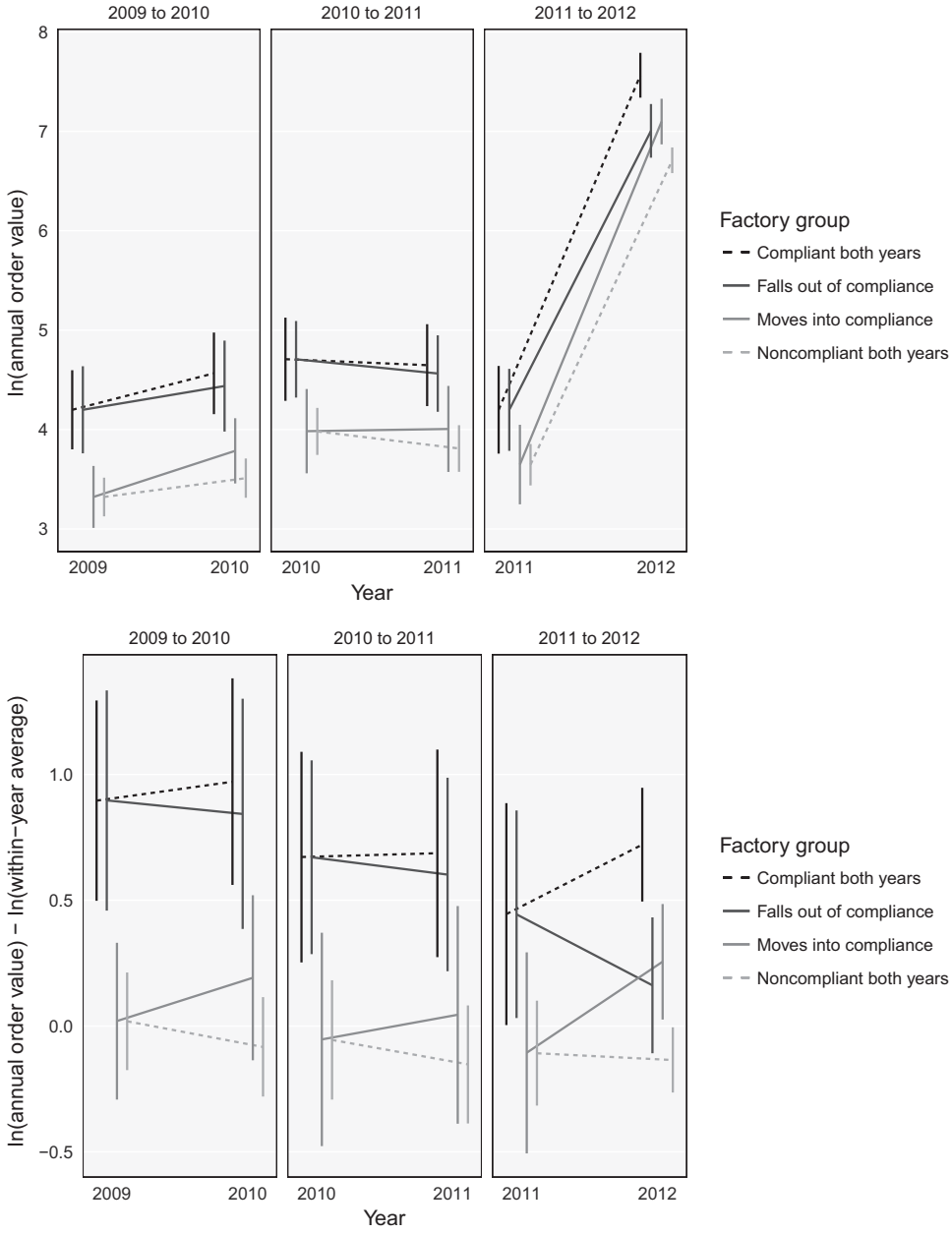
subject to activist pressure prefer importing from compliant factories in order to reduce reputational risk.[8]

Discussion

The importers in our study exhibit a preference for doing business with exporters that comply with basic labor and environmental standards. This pattern is inconsistent with either one or the other following assumptions

[8]Additional analyses and robustness checks appear in the supporting information. These include relaxing the linearity assumption of performance controls, adding industry-specific trends in purchasing, adding controls for the length of the relationship between the sourcing agent and the manufacturers, and reestimating effects in China and the rest of the world. The supporting information also presents qualitative summaries of the common violations of key audit items.

FIGURE 5 Order Values by Compliance Trajectory (Entropy-Balanced Subsamples)



Note: The figure adjusts the analysis in Figure 4 using entropy balancing (Hainmueller 2012). Each factory subsample is balanced on first-year order value, prior-year order value trend, distribution of factory locations, and distribution of factory product types. Note that pre-trends are not available for balancing in 2009–10 because we have no prior-year order value to establish trends. See SI Table A7 for regression estimates and SI Table A6 for balance tables. Error bars show 95% confidence intervals.

underlying the race-to-the-bottom logic in global trade: (a) that compliance with basic labor and environmental standards makes exporters less competitive in price, quality, or delivery, or (b) that importers are unwilling to pay more to do business with compliant exporters. The absence of quantities and prices in our data does not allow us to tell which of these assumptions is inaccurate. We can say that they do not appear to simultaneously obtain in this sample of retailers and export manufacturers.

Our results suggest the presence of economic incentives for complying with social and environmental standards, whether these dynamics are driven by certain

Table 4 Effects of Compliance by Exporter Industry (Logged USD, Thousands)

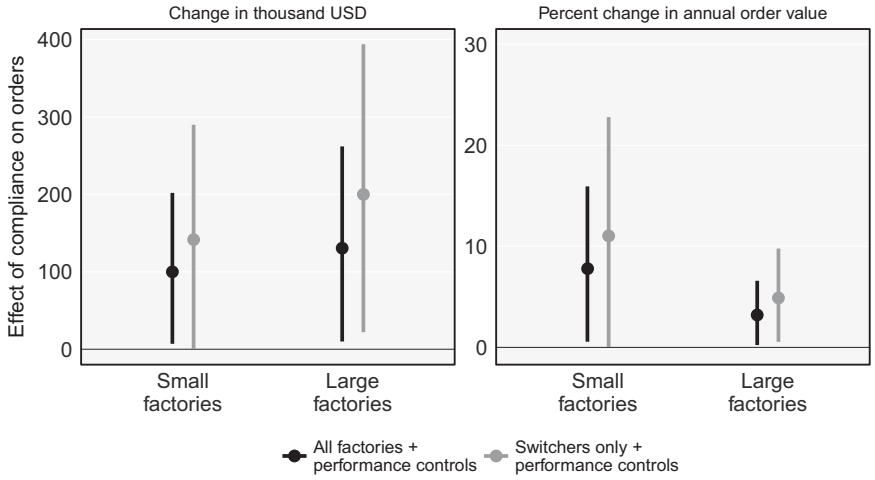
	Main Panel with Performance Data		Subsample: Compliance Transitions	
	(1)	(2)	(3)	(4)
Clothing × Compliance (binary)	.190		.196	
	(.061)		(.061)	
× Compliance (A–D)		.105		.106
		(.042)		(.044)
Furniture . . . × Compliance (binary)	−.012		−.022	
	(.109)		(.109)	
× Compliance (A–D)		.047		.042
		(.076)		(.079)
Toys × Compliance (binary)	.065		.051	
	(.103)		(.103)	
× Compliance (A–D)		.070		.031
		(.078)		(.079)
Cookware × Compliance (binary)	.030		.030	
	(.113)		(.112)	
× Compliance (A–D)		.004		.021
		(.083)		(.086)
Other Products × Compliance (binary)	.060		.063	
	(.294)		(.299)	
× Compliance (A–D)		−.020		.066
		(.216)		(.234)
Performance controls	✓	✓	✓	✓
Factory fixed effects	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓
Constant	6.8	6.7	7.4	7.3
	(.193)	(.196)	(.357)	(.359)
Observations	6,915	6,915	3,235	3,235
R-squared	.005	.005	.011	.009
Factories	2,447	2,447	1,028	1,028

Note: The table reports OLS panel fixed effects regression from 2009 to 2012, showing heterogeneous effects by factory industry. Models 1–2 fit using the main panel of factories with performance data (Table A1). Models 3–4 fit on the subsample of the main panel that undergoes a transition in compliance status over the period studied. Standard errors are clustered by factory in parentheses.

exporters proactively improving compliance or by the demands and market power of importers. Perhaps most surprising is that we observe these effects in emerging markets with poor enforcement of labor and associational rights. In this study, 91% of the export transactions (by value) originate from countries in the bottom two quartiles of fundamental labor rights, and 78% originate from countries in the bottom quartile in freedom of association rights (SI Table A2).

Understanding these dynamics in global supply chains is important to understanding the contemporary nexus of trade and social institutions. International trade is increasingly characterized by the prevalence of global supply (or value) chains (Gereffi, Humphrey, and Sturgeon 2005; Porter 1986). In 2009, intermediate inputs traded within global supply chains accounted for 30% to 60% of national exports in G20 countries (OECD, WTO, and World Bank Group 2014). As a growing share of trade takes place within global supply chains, understanding their political economy is both theoretically relevant and of growing policy importance. The accompanying fragmentation and worldwide dispersion of production have created significant challenges for traditional forms of regulation of labor and environmental standards.

FIGURE 6 Effects of Compliance by Factory Size



Note: The figure displays effects of compliance on order value by factory size, estimated in panel models reported in the supporting information. Factories are divided into two equally sized pools by average annual employment: small (4–293 employees) and large (293–11,105 employees). Error bars show 95% confidence intervals. Results are also reported in SI Table A11.

We estimate that achieving compliance with basic standards results in importers increasing annual order value by 4% on average (Table 3). Do these incentives for compliance imply that raising workplace standards is a good investment for emerging market exporters? The answer depends on whether the increase in order value results primarily from increased quantities or prices.[9] If the compliance premium is due entirely to increased volume, and assuming momentarily that compliance is costless and other costs scale with volume, the factory's increase in operating profit is modest. Assuming a profit margin of 2%, this volume premium would amount to an increase in gross profit by just $2\% \times 4\% = .08\%$, before accounting for any costs of compliance. Yet if the 4% increase in value is a price premium, the same manufacturer's profit margin would increase from 2% to 6.1%. Decomposing the compliance premium into quantities and prices is therefore crucial to understanding the implications for exporters.

To put these premiums in context, consider the costs of paying "living wages" to emerging market manufacturing workers. The Fair Wear Foundation (2014) examined garment manufacturers in China and Vietnam and estimated paying a living wage would require a 10% to 102% increase in mode sewing wages. In turn, these wage increases would raise unit prices paid by importers by 2% to 12% (2014, 18). A compliance premium of 4%, if partially composed of a price premium, could therefore offset the cost of living wages in some exporters. The prospects for doing so appear greater in small exporters, where the compliance premium point estimate ranges from 7% to 10% of average order size (Figure 6).

The foregoing analysis of the economic returns to compliance is necessarily somewhat speculative. Future work using more fine-grained data on prices and quantities may clarify these returns and their implications for investments in improved labor and environmental standards.

This study also suggests that transnational private regulation may be more effective than previously believed. The analysis suggests the presence of economic incentives for compliance in industries characterized by strong activist campaigns and private regulatory responses from industry. This finding complements new survey research on the willingness of developing country producers to incur compliance costs to integrate into global supply chains (Malesky and Mosley 2018). However, it also raises new questions about private regulation in global supply chains. Are the incentives detected here sufficient to support desired investments in worker wages, factory safety, and environmental impact mitigation? What is the appropriate compliance premium in both price and volume to justify these investments? Future research may answer these questions and provide practical recommendations on the design of multinational sourcing practices that support improved labor and environmental standards.

[9]In the following calculations, we assume that the 4% increase in buyer spending is uniform across all customers of the exporter, even though our data only capture this relationship for the group of importers represented by the sourcing company.

This study is the first to estimate the relationship between exporter social compliance and importer behavior in a large international sample of factories, but there are important limitations to keep in mind. First, we cannot tell whether we observe these patterns because (a) certain exporters can achieve compliance with minimum standards without raising prices, or (b) certain importers are willing to pay more to do business with compliant exporters. We can only infer that both are not simultaneously true. Second, because these data come from one sourcing agent, they do not account for the entire portfolio of customers for each exporting factory. These unobserved customers may be indifferent to social compliance or even reduce orders when factories achieve compliance. In the latter case, the estimated effect of compliance may represent a reallocation of business away from importers that are insensitive to social compliance and toward importers in our study that are sensitive to compliance. In this case, it seems likely that the reallocation occurs because exporters perceive economic benefits to doing business with reputation-sensitive importers, such as better prices or opportunities for growth. Addressing these possibilities awaits future research using the administrative records of exporting factories, rather than their customers. Third, the patterns observed here pertain to trade between retailers in Western countries and exporters of light manufactures in emerging markets. The study has little to say about incentives for compliance in other global supply chains, such as those for electronics, minerals, or agricultural products, or where both trading partners are based in developing or middle-income countries.

Although within-factories estimates from panel data offer improved causal credibility over cross-sectional analyses, these models may also obscure alternative causal pathways between compliance to importer behavior. If exporters build durable reputations as either socially compliant or noncompliant, importers familiar with these reputations may discount information transmitted through compliance audits, reasoning that some year-on-year variation reflects measurement error rather than meaningful improvement or declines. Consistent with this supposition, we find smaller magnitude effects of compliance on factories that have longer business relationships with the sourcing agent, although we cannot reject the hypothesis that these effects are identical (SI Table A12). Panel fixed effects models remove any static effects from durable factory reputations. This reduces bias insofar as these reputations reflect issues other than social compliance and are correlated with compliance status in cross-section. However, if reputations for social responsibility are themselves important drivers of customer orders, factory fixed effects would mask these relationships.

Keeping these limitations in mind, this research contributes new findings to debates about a race to the bottom in global supply chains (Locke 2013; Mosley 2010; Rodrik 1997; Vogel 2005; Weil 2014). The results suggest the possibility of a "high road" to growth for small exporters in emerging markets. Social upgrading—achieving compliance with international labor, health, and environmental standards—may offer an opportunity for these enterprises to pursue more lucrative opportunities in the global economy. Yet it is also clear that whatever market incentives exist for such social upgrading, they are insufficient to bring the majority of exporters in this study into compliance. Although the net impact of activist campaigns and resulting private regulatory activities may be positive, this model still falls far short of guaranteeing basic rights for the millions of workers employed in global supply chains.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix A: Additional Tables and Figures
Appendix B: Effects of Individual Compliance Items