

# Production Goes Global, Compliance Stays Local: Private Regulation in the Global Electronics Industry

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## **Abstract**

Poor working conditions in global supply chains have led to private initiatives that seek to regulate labor practices in developing countries. But how effective are these regulatory programs? We investigate the effects of transnational private regulation by studying Hewlett-Packard's (HP) supplier responsibility program. Using analysis of factory audits, interviews with buyer and supplier management, and field research at production facilities across seven countries, we find that national context – not repeated audits, capability building, or supply chain power – is the key predictor of workplace compliance. Quantitative analysis shows that factories in China are markedly less compliant than those in countries with stronger civil society and regulatory institutions. Comparative field research then illustrates how these local institutions complement transnational private regulation. Although these findings imply limits to private regulation in institutionally poor settings, they also highlight opportunities for productive linkages between transnational actors and local state and society.

**Keywords:** corporate social responsibility; globalization; labor standards; private regulation; transnational governance

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## Introduction

When Apple, the largest public corporation by market capitalization, joined the Fair Labor Association in 2012, it marked a turning point in efforts by global brands to distance themselves from the labor and environmental problems occurring in their supply chains. Whether willingly or under external pressure, global buyers in an array of industries have embraced a degree of responsibility for workplace conditions among their suppliers that was rare just a decade earlier. These public commitments, administered through systems of private, voluntary regulation, imply that private actors can somehow overcome or ameliorate the economic, social, legal, and political factors underlying poor working conditions persistent in the developing world. But do they? How effective are private voluntary initiatives at improving labor standards in these sites of global production?

This paper offers new empirics and theory on how transnational private regulation shapes workplace outcomes in emerging markets. Specifically, we argue that the local institutional context remains the key predictor of compliance even after adjusting for factory-level features held to be important from previous literature. We establish the importance of local context empirically, ruling out common alternative explanations, using quantitative analysis of factory social audits across twelve countries. We then use qualitative fieldwork to identify two institutional dimensions that complement private regulation. The first is the strength of state regulatory institutions. The threat of state-enforced penalties for illegal behavior creates incentive for factories to address problems identified by private auditors. The second is the strength of local civil society. Independent, worker-oriented organizations can cooperate with employers and global brands to improve standards.

This study offers new understanding of the complementarity between transnational private regulation and local institutions and the mechanisms through which these complementarities emerge. Previous research suggests that private regulation need not crowd out public regulation (Bartley 2011, Locke 2013). However, complementarities identified in previous research were either uncoordinated (Amengual 2010, Coslovsky and Locke 2013) or driven by public sector actors (Amengual 2014). In contrast, we show how complementarity can arise from *interaction* between transnational private regulation and local institutions. Moreover, these synergies need not be state-driven; partnership between business and local civil society can bypass ineffective state institutions to raise standards.

We arrive at these findings by studying the efforts of one of the world's largest electronics firms, Hewlett-Packard (HP), to regulate working conditions and labor rights in its global supply chain. We first review the scholarly literature and theoretical debates concerning private regulation of global supply chains. We then describe the setting of our research: the global electronics industry and HP's supply chain compliance program. This is followed by analysis of compliance and improvements using audits of HP supplier factories. We then examine whether the regional disparities we observe can be explained by factory-level characteristics, testing hypotheses from the literature on supply chain social responsibility. After rejecting factory-level explanations for this divergence, we offer case study evidence on the mechanisms through which domestic institutions interact with private regulation to enhance or undermine its efficacy. We conclude by discussing the implications of our findings for effective transnational private regulation.

## Private regulation of global supply chains

The current era of globalization is characterized by fragmented ownership and the geographic dispersion of production. This economic transformation poses a new set of opportunities and challenges for emerging economies. Integration with global supply chains may bring new employment opportunities, technological spillover, or higher wages to local firms and their workers. Yet multiple sources document harsh working conditions and environmental degradation across a variety of global industries (Connor & Dent 2006; Verite 2004; GoodElectronics 2009; SwedWatch, SACOM & SOMO 2008; makeITfair 2009; Bormann & Plank 2010). While many developing countries appear to possess strong regulations, in practice these states often lack the ability (Laffont & Tirole 1993; Baccaro 2001; Elliott & Freeman 2003; Estache & Wren-Lewis 2009) or willingness (Bhagwati 1995) to enforce their own laws.

A lively debate has developed over whether, and under which conditions, labor and environmental standards can be enforced in an era of globalized production. One stream of research in international political economy focuses on *how* developing countries engage with global production, arguing that foreign direct investment raises labor standards while subcontracting relationships depress them (Mosley & Uno 2007; Mosley 2011). Others argue that ethical production depends upon national legislation and state enforcement of these laws (Weil 1996; Reich 2007; Piore 2005; Schrank 2009). Still others see potential for consumer pressure to incentivize suppliers to compete for the best combination of ethical practice and price (Fung et al 2001; Moran 2002). Indeed, lead firms across many industries have developed private regulatory systems that set standards—often called “codes of conduct”—and monitor their supply chains for compliance to these codes (Locke 2013).

This study contributes to scholarship on the conditions under which private regulation stimulates improved compliance with social and environmental standards. Formative work on private regulation examined codes of conduct within athletic footwear (Strasser & Becklund 1993; Rosenzweig 1994; Barrientos & Smith 2007; Locke, Qin & Brause 2007), apparel (Elliott & Freeman 2003; Esbenshade 2004; Bartley 1996; Weil 2005; Rodriguez-Garavito 2005; Barrientos & Smith 2007; Locke et al 2009; Ruwanpura and Wrigley 2011), and agriculture (Barrientos & Smith 2007; Riisgaard 2009, Coslovsky and Locke 2013). These studies of low-technology industries observed generally poor compliance with international labor and environmental standards and modest-to-no improvement as a result of private regulatory efforts. Recent scholarly inquiry has suggested that rather than voluntary private regulation functioning effectively in isolation, a mixture of systems involving public and private actors is key (Amengual 2010; Weil 2005; Locke, Kochan, Romis & Qin 2007; Locke, Qin & Brause 2007; Haufler 2001; Kolben 2007). In fact, it appears as if private compliance efforts are often “layered” upon more traditional forms of state regulation (Bartley 2011; Trubek & Trubek 2007) and that under certain circumstances, these two forms of regulation can either complement or undermine one another.

We focus on the global electronics industry, a setting where one might expect higher degrees of compliance with labor standards and hence, improved working conditions. Many electronics suppliers are large multinational corporations, in some cases producing components that command high price premiums. Their varying sophistication and market position may create new dynamics of interaction with global buyers (Gereffi et al 2005). Furthermore, whereas nearly all lead firms in previous studies adopted supplier codes of conduct in response to consumer pressure or public scandal, our research subject (HP) anticipated these pressures and

preemptively developed internal and industry-wide strategies for regulating social conditions in the supply chain. One might therefore expect HP to show more promise for effective private regulation.

## **Setting: Global Electronics Production and HP**

The electronics industry is one of the largest and fastest-growing manufacturing sectors, typified by production networks involving numerous suppliers across the globe and employing over 15 million worldwide (OECD, 2008). In the late 1980s, leading firms transitioned away from vertically integrated production structures to a new model of outsourced manufacturing (Sturgeon 2002; Gereffi et al 2005). Their manufacturing facilities were typically sold to firms specializing in production, resulting in the rapid growth of electronics contract manufacturers such as Flextronics, Celestica, Sanmina, Jabil, and Hon Hai Foxconn (Barnes et al 2000; Luthje 2002). Notwithstanding the huge volume of contract manufacturing business, profits remain highly concentrated in the lead firms involved in product definition, marketing, and retail. In 2011, the five largest global brands in electronics reported almost three times the revenue but nearly thirty times the profit of the five largest contract manufacturers (Locke, Pal, and Rissing 2013: 525).

In response to volatile demand and cost pressures within the electronics supply chain, contract manufactures have adopted employment policies characterized by low wages, precarious or temporary work, and high reliance on migrant workers (Bormann & Plank 2010; makeITfair 2009; CAFOD 2004; Smith et al 2006; Chan & Peyer 2008). These practices have contributed to poor working conditions, especially excessive work hours and health and safety violations (Smith et al 2006; Overeem 2009). These working conditions were highlighted by scandals in the

world's largest electronics manufacturer, Foxconn, from a string of worker suicides (Pun & Chan 2012) to deadly workplace explosions in 2011 due to poor industrial hygiene.<sup>i</sup>

Hewlett Packard (HP) is one of the world's largest global electronics firms.<sup>ii</sup> In 2010, HP shipped over 64 million personal computers (PCs) for a global market share of 20%.<sup>iii</sup> This output requires an extensive supply chain. During fiscal year 2010, HP directly employed roughly 325,000 people across 170 countries and contracted with approximately 1,000 production suppliers in over 1,200 locations worldwide (Hewlett Packard 2011). Although it is difficult to estimate the precise number of workers employed in its supply base, HP reports that the 90 suppliers audited in 2010—less than 10% of all subcontracted firms—employed over 260,000 workers (Hewlett Packard 2011).

HP established a supply chain code of conduct in 2002, and went on to help establish the Electronics Industry Citizenship Coalition (EICC) with seven other firms in 2004. During the period covered by this study, HP's supply chain program combined compliance auditing, capability building, and collaboration with other stakeholders such as NGOs to improve working conditions among its suppliers. These efforts reflect the firm-level commitment that some consider critical to the success of non-governmental regulation (Mamic 2004).

## **Factory Audit Data**

We gained access to HP's supplier audit reports to study compliance with labor and environmental standards in factories across the world. Use of internal audit reports introduces concerns of data validity, since audits are conducted largely by HP staff rather than independent auditors and represent temporally limited snapshots of factory practices. Previous studies suggest that social auditing may suffer from shortcomings including superficial efforts by suppliers to "pass" auditor checklists and insufficient expertise in the myriad technical, cultural

and linguistic skills needed to evaluate workplace practices in different countries (O'Rourke 2002; Esbenschade 2004). This section summarizes HP's auditing practices and discusses our efforts to ensure data validity in the analyses that follow.

HP's supplier audit is based on the EICC code and consists of 53 items. These workplace standards are listed in Online Appendix Table A2, and more detailed descriptions are publicly available.<sup>iv</sup> However, in certain cases the standards themselves require attention. The "Freedom of Association" standard states: "The rights of workers to associate freely, join or not join labor unions, seek representation, and join workers' councils, and bargain collectively *in accordance with local laws* shall be respected" (emphasis added). As local law in countries like China greatly restricts these rights, facilities that are nominally compliant may not conform to the commonly understood definition of freedom of association as endorsed by the International Labour Organization. The content of the remaining standards is generally unexceptionable, addressing issues that include humane treatment, non-discrimination, and a variety of workplace safety measures. Violations of standards are marked as major or minor nonconformances. We adopt a conservative measure of compliance in the following analyses; audit items are compliant only if auditors find neither major nor minor nonconformances.

First-time audits usually take two days and make use of document reviews, manager interviews, worker interviews, and inspection of production facilities. Among facilities audited multiple times, they receive on average 1.5 audits per year. The auditors themselves are organized into regional teams and do not necessarily work on supplier responsibility full-time. They are largely members of HP's Global Procurement Services division, based in regional offices around the world.

Facilities at high risk of code violations were given first priority in auditing. The criteria for assigning risk include factory location, volume of production, amount and type of manual labor involved, and exposure to chemicals throughout the production process.<sup>v</sup> These audit selection criteria mean that poor performers receive more frequent audits than highly compliant plants. Therefore, audit data are primarily informative about the subpopulation of suppliers at greatest risk for violations of labor and environmental standards.

Our site visits to 45 supplier facilities across seven countries allowed our research team to look for discrepancies between audit reports and on-the-ground conditions in factories. We uncovered a small number of cases where facility practices differed from the most recent audit reports, including auditing to looser working hours regulations in two Southeast Asia plants and persistent disciplinary wage deductions in a Czech plant. Aside from these findings, the practices observed matched HP's audit reports. We also used audit reports to examine variation between audit items across national settings. Although the specific regulatory standards surrounding work hours and wages vary across countries, auditing techniques were highly similar across countries. Detailed analyses of both within-audit and cross-national variation are available in the online appendix.

HP's use of third party auditors provides another opportunity for audit validation. HP periodically employs professional third-party auditors in response to allegations of major problems at suppliers and also to validate their own internal auditing procedures. Audits by third-parties account for approximately 9% of all audits in our data. We compared third-party audit findings against those of HP's internal auditors in Table 1. There were 29 facilities audited by both HP and third-party auditors. We find no major differences in their assessment of these facilities' labor compliance. When examining Health and Safety, HP auditors assigned

lower scores than the third-party auditors. However, the third-party auditors assigned marginally lower scores for environmental compliance.

[Table 1 around here]

HP shared over five hundred original social and environmental responsibility audits conducted between June 2004 and January 2009. Due to format changes starting in 2005, we exclude 2004 audits from our analyses, for a total of 484 audit reports covering 261 production facilities in fourteen countries. These audit reports cover roughly 22% of HP's total of 1,200 production locations (Hewlett-Packard 2011).

A majority of supplier facilities comply with the code in thirteen of twenty key categories.<sup>vi</sup> Auditors found high compliance in freely chosen employment (87% compliant), freedom of association (87%), pollution control (87%), and air emissions (90%). At the other extreme are working hours (29% compliant), emergency preparedness (30%), and the management of hazardous substances (32%). In addition, 42% of audited facilities were noncompliant in wages and benefits, arguably the most important standard to workers.<sup>vii</sup> These high rates of noncompliance mitigate concerns that suppliers are successfully manipulating information to deceive auditors. They also show that the supply chain is far from fully compliant with the EICC code, a finding affirmed by HP in its own corporate citizenship report (Hewlett Packard 2011).

## Improvements in Workplace Practices

Despite the failure to achieve full compliance, working conditions have apparently improved during HP's engagement with its suppliers. Large and statistically significant improvements were observed in 12 of 20 audit items, including nearly all elements of the health and safety audit (Table 2). Without an unaudited reference group, we have no control group against which to compare these improvements. However, it is clear that suppliers improved their social compliance during the period we study.

At the same time, key areas of social performance remained unchanged after repeated audits. Working hours improved only marginally to 30% compliance. Wage practices showed no improvement at all. Even for improving audit items, the resulting compliance levels were in some cases quite low. While ergonomics compliance improved by 19 percentage points, only 46% of facilities were compliant with this provision as of the most recent audit HP shared with us. This finding is consistent with previous research showing that, notwithstanding gradual improvements, auditing regimes show uneven performance and buyers appear to be willing to source from noncompliant factories (Ruwanpura and Wrigley 2011, Locke 2013).

[Table 2 around here]

Our examination of audit results also uncovered large variation from country to country. For example, industrial hygiene among Mexican suppliers improved from 44% to 100% compliance in repeated audits, but among Chinese suppliers compliance actually declined from 28% to 25%. This variation, combined with our fieldwork in electronics suppliers across seven countries, led us to more closely examine the variation across national settings of production.

Ideally, we would quantitatively analyze compliance and improvement in each country in our dataset, but small numbers of factories in many countries render such analysis impractical. Instead, we break countries into three groups that vary in economic development and two key domestic institutions we believe influence the efficacy of private regulation: regulatory authorities and civil society freedoms. Effective state regulatory institutions increase the threat of sanction against suppliers when private auditing uncovers workplace violations. When legal violations become known to local regulatory authorities, noncompliant suppliers may be subject to fines or other administrative penalties. The more powerful these institutions, the more powerful the incentive to remediate violations identified by private auditors. Civil society freedoms allow for the emergence of labor-friendly organizations that can play the roles of whistleblowers and worker advocates. We explore the interaction between civil society organizations and private regulation in greater qualitative detail in the final section of this article.

Our three country-groupings are presented in Table 3. The left-hand side identifies groups and how many factories are located in each country. The countries are sorted by per capita GDP, adjusted for purchasing power parity, according to the International Monetary Fund. We also display World Bank classifications of Higher, Upper-Middle and Lower-Middle income countries. To indicate the quality of regulatory institutions, we present measures from the World Bank Worldwide Governance Indicators (WGI) (Kaufmann, Kraay, and Mastruzzi 2009). “Government Effectiveness” measures the quality of public bureaucracy and policy implementation, whereas “Rule of Law” focuses on contract enforcement, policing, and courts. Together, they provide information about the extent to which laws are implemented fairly across these countries. We adopt this focus on implementation to acknowledge that there may be a

wide gap between the legal regulations on the books and their implementation in actual workplaces (Caraway 2009).<sup>viii</sup>

[Table 3 around here]

To characterize civil society freedoms, we present measures from both WGI and Freedom House's annual "Freedom in the World" report. "Voice and Accountability" includes a variety of freedoms, including democratic government, free media, and the ability to freely form associations. The Freedom House measure for "Associational and Organizational Rights" is more narrowly focused on the freedom to demonstrate, form non-governmental organizations, and organize trade unions.<sup>ix</sup>

These groups also have relatively consistent regional features. The high-income group includes European Union countries and the two wealthiest Asian economies; the developing countries are in Southeast Asia and Latin America; and China occupies its own category. While Hungary has a similar income level to Brazil, it remains classified with its regional neighbors the Czech Republic and Poland because of the strength of its regulatory institutions. Singapore is classified in the high-income group with other wealthy countries with strong regulatory institutions, notwithstanding its weak civil society freedoms.

The bottom of Table 3 reports the averages for each group and highlights their variation in regulatory institutions and civil society freedoms, and the distinctive features of each group are also presented in Table 4. The High-income countries exhibit more effective policy implementation and legal enforcement. On average, they also exhibit greater democratic freedoms, which allow for the presence of civil society organizations and labor organizations.

The Developing countries are significantly less wealthy with weaker policy implementation and legal development. They also have a more uneven landscape of associational freedoms. China is comparable to the Developing countries in regulatory institutions, but it shows much weaker civil society freedoms, with the lowest ratings in freedom of association and voice and accountability.

[Table 4 around here]

Compliance in initial audits is generally highest in the high-income factories, lower in developing countries, and lowest in China. If the auditing program imposes a floor on labor conditions, we expect to see convergence among the three groups and larger improvement among low-performers in the initial audit. Instead, we see different behavior between the China-based factories and the factories located in other developing countries. The developing country pool improves by 16 percentage points in labor compliance, 25 in health and safety, and 22 in environment. In contrast, China improves by just 6 percentage points in labor, 14 in health and safety, and 6 in environment. Factories in the developing country factories closed much of the compliance gap with those in high-income countries, but the Chinese plants did not. Detailed compliance levels by country-group are reported in the online appendix.

Divergent patterns of improvement between factories in China and in other developing countries are also evident on an item-by-item basis. Figure 1 displays improvement estimates (and confidence intervals) between first and the most recent audits HP shared with us for each item of the labor audit. The developing country pool shows improvement on nearly every item, including inhumane treatment and child labor. In contrast, we only detect significant

improvement among Chinese plants in non-discrimination and freedom of association. The data do not allow us to reject the hypothesis that these improvement effects are identical; we can only say that we find strong evidence of improvement among the developing country plants and more equivocal findings among the China plants. It is important to note that while developing country suppliers *improve* more than those in high-income countries, their initial levels of compliance were lower and their scores on the last audits HP shared with us are almost identical to that in the high-income countries. In hours and wages, a persistent problem area in China (Kortelainen 2008), Chinese factories showed no improvement.

[Figure 1 around here]

As we noted above, HP's audits are not randomly assigned to factories. Could this selection process in some way bias our findings? We noted above that HP prioritized high-risk factories for audits, which predicts that high-risk (low compliance) factories will be overrepresented in the sample. Yet our analysis deals exclusively with suppliers selected to receive more than one audit, and for each of these plants we examine only their initial and final audits. In other words, among suppliers audited multiple times, all are equally represented in these data. (This applies to the regression analysis in the following section as well.). This means that our analysis has little to say about plants that were rated low-risk facilities and only audited once, but it is precisely the facilities at highest risk of labor violations that are of greatest substantive interest in the study of private regulation.

These differences between country-groups are consistent with our hypothesis that domestic institutions can enhance or hinder the efficacy of private regulation. However, variation in national institutions is also confounded by systematic differences in the types of

factories in these countries and their relationships to HP. In the following section, we test these alternative hypotheses about the determinants of regulatory compliance.

## **Institutional versus factory-level explanations**

Based on our initial analysis of compliance and improvement trends, we hypothesize that the domestic institutional context is an important determinant of the efficacy of private regulation. We posit that compliance with social standards is primarily explained by the local institutional environment, rather than factory-level predictors. In nearly every country hosting global supply chains, national governments have passed strong laws that regulate the conditions of employment and protect the rights of workers. However, in many of these countries, these labor laws are often violated and the labor inspectorates charged with inspecting factories and enforcing the laws are weak, underfunded, and at times corrupt. To redress these problems, a number of countries have invested in innovative government programs and promoted new forms of more “responsive” regulation. In some countries, this innovation in regulation is promoted by and even co-produced by groups in civil society (Amengual 2010, 2014; Coslovsky 2011; Pires 2011). According to Michael Piore and Andrew Schrank (2008), a “regulatory renaissance” is underway in a host of developing countries. As a result of this renewed investment in labor regulation and the apparent role of civil society, we would expect that compliance outcomes would positively correlate with the strength of these domestic institutions. Specifically, we hypothesize two mechanisms linking the domestic institutional environment to improved compliance. First, information gathered by HP auditors may trigger greater improvement in the presence of strong local regulatory authorities, as the sanctions for noncompliance are higher in these settings. Second,

civil society institutions may enable improvements by providing representation of worker interests and engaging in joint problem solving surrounding issues raised by private auditors.

We operationalize these institutional dimensions by dividing factories into the three country groups described in Table 3. The high-income countries have strong regulatory institutions and civil society freedoms. The developing country group has weak regulatory institutions but relatively strong civil society freedoms. Finally, China occupies its own group characterized by weak regulatory power and weak civil society. Our theory predicts that both the high-income *and the developing countries* will exhibit higher levels of compliance than Chinese plants. Because the measures of domestic institutions are highly aggregated, we leave the detailed exploration of mechanisms to the case study evidence in the final empirical section of the paper.

**H1. Domestic institutions.** Stronger regulatory and civil society institutions predict improved factory outcomes under private regulation.

However, previous research on globalization and transnational governance has generated several alternative hypotheses to explain varying success of private regulatory efforts. These alternative explanations are not exclusive, and thus our research does not adjudicate between conflicting theories. Instead, we examine whether any of the factors below can account for the regional patterns of workplace compliance and improvement we identified above.

### **Intensity and style of private interventions**

One important confounder is variation in HP's engagement with factories surrounding compliance issues. Compliance may be explained in part by the intensity of HP's auditing engagement, measured by total number of audits of the facility. Alternatively, it may be

explained by “commitment”-based efforts to help suppliers through capability-building programs (Locke, Amengual & Mangla 2009).

**H2a. Auditing.** Suppliers that receive more audits will show greater workplace improvement.

**H2b. Capability-building.** Suppliers that participate in management or technical training programs will show greater workplace improvement.

### **Power in global value chains**

Research on global value chains emphasizes differing power relations among actors in supply chains (Gereffi et al 2005). Under certain conditions—when transactions take place through competitive markets or suppliers depend upon few customers—buyers have power over their suppliers and thus can dictate the terms of contracts. On the other hand, where suppliers have capabilities that cannot be easily replicated by competitors, they retain more power vis-à-vis their global buyers. Applying the global value chain literature to private monitoring schemes, we expect higher compliance with buyer demands in buyer-driven value chains, especially among suppliers producing commodity goods. Conversely, if suppliers produce unique or specialized products or components, we expect that they would exercise greater power vis-à-vis their buyers and thus be more resistant to buyer demands.<sup>x</sup> We operationalize supply chain power in two ways: supplier production of high value-added goods and how much HP spends at the supplier.<sup>xi</sup>

**H3a. High value-added production.** Suppliers manufacturing high value-added (i.e. less commoditized) goods will enjoy greater bargaining power and therefore be more resistant to HP’s demands for workplace improvement.

**H3b. Buyer spend.** HP’s top suppliers (by spend) enjoy more secure business relationships and therefore have increased ability to resist demands for social compliance.

## **Supplier Corporate Social Responsibility**

Many members of the global electronics supply chain are themselves large multinational firms. In recent years some have shown increased commitment to social responsibility (CSR) goals through establishing CSR departments and publishing reports on their activities. Whether or not these activities go beyond superficial public relations work, public commitments to CSR goals increase reputation risks for firms, and reputational concerns can influence workplace governance. Recent research on global supply chains suggests that reputation-conscious buyers drive improved working conditions among their suppliers (Oka 2009). Similarly, suppliers that make public commitments to CSR goals may show greater compliance with buyer standards.

**H4. Supplier CSR commitments.** Suppliers that make public commitments to social responsibility will show greater improvement.

We investigate these hypotheses by operationalizing the factors described above and estimating regression models for factory compliance levels. The outcome variable is the percentage of audit items in the labor, health, and environment sections that were compliant in each facility's most recent (last shared by HP) audit. Auditing intensity is operationalized using the total number of audits received by the factory, ranging from two to six. We measure exposure to managerial training with an indicator showing whether the factory participated in the first round of the Focused Improvement Supplier Initiative program in China. In our data, 24 suppliers sent at least one manager to receive forty days of managerial training on root cause analysis, overtime management, communication skills, environmental compliance, and other skills intended to improve compliance with the HP code. This measure captures a particular version of capability-building that relies on off-site managerial training, rather than directly

engaging suppliers on the factory floor (Sako 2004, Distelhorst, Hainmueller, and Locke 2014), and focused entirely on China, where code violations were most prevalent.

Strategic importance to HP is operationalized with a binary indicator of whether the factory was listed among HP's top 100 suppliers by procurement expenditures (67% were). We also worked with HP managers to sort supplier products into commodities (low value-added) and non-commodities (higher value-added); 64% of factories were engaged in high value-added production. Finally, we measure supplier commitment to social responsibility by indicating whether their websites included a Corporate Social Responsibility report (23% did). Summary statistics for all variables are reported in the online appendix.

We also control for two potentially confounding factors related to time. One concern is that variation across factories may reflect differences in when audits were conducted.<sup>xii</sup> Our model therefore includes year fixed-effects to flexibly model variation over time. Additionally, electronics production is characterized by seasonal fluctuations in demand, with higher orders to suppliers in preparation for the back-to-school and holiday seasons. The production pressures of high-orders may induce more workplace violations; a dummy indicates whether the audit was conducted during this high-demand period from June to November.

## Results

We find that regional variation in compliance is robust to controlling for all factory-level characteristics described above. Table 5 reports the results of OLS regression and shows that the inclusion of factory-level covariates does not appreciably change the magnitude or statistical significance of the regional differences we observe. Consistent with H1, both developing and high-income countries out-perform Chinese plants in every section of the social audit. High-income countries enjoy stonger regulatory capacity and more robust civil society, and

therefore their performance is unsurprising. What is more striking is the large gap between developing countries and China. Labor compliance among factories in our developing country pool is 26-30 percentage points higher than the China plants. The difference is 29-31 percentage points in health and safety and 13-16 percentage points in environment. The developing countries are slightly richer, but they have comparable quality of regulatory institutions to China. A key difference between these two groups is the average strength of associational rights and civil society organizations. We explore the role that these organizations play in private regulation in the following section.

[Table 5 around here]

The analysis also reveals differences between the developing and high-income groups, which differ in economic development and the quality of their regulatory institutions. Factories in the high-income countries are estimated to score 10 (column 1) or 14 (column 2) percentage points higher in labor compliance than those in the developing countries, differences with  $p$ -values of 0.03 and 0.02 respectively. However, these differences are markedly smaller than those observed between China and the rest of the factory pool. We find no difference between developing and high-income countries in health and safety or environmental compliance.

After controlling for regional effects, we find no evidence to support the other hypothesized drivers of effective private regulation listed above. The only marginally statistically significant estimate is a negative correlation with increased auditing, consistent with HP's claim that they audit high-risk plants more often. However, even this effect is imprecisely estimated and appears in only one model. We find no effect for being either a high-value added supplier or

one of HP's Top 100 suppliers; this is consistent with the observation of high levels of modularity and low asset specificity in electronics manufacturing (Sturgeon 2002). When interpreting the results for capability building, it should be noted that we study just one program that relied on off-site managerial training. There are more intensive versions of capability building, such as Nike's diffusion of lean manufacturing techniques among footwear and apparel suppliers (Distelhorst, Hainmueller, and Locke 2014), that may yield different results. We noted above that there are small deviations in audit scores between third-party and HP auditors. We re-estimated these model with an indicator of whether the audit was conducted by a third-party, and found no change in the main effects.

To summarize our quantitative results, we observe divergent patterns in the improvement and final compliance levels of factories across different types of countries. Stark differences across institutional contexts persist after controlling for key factory-level characteristics. In fact, none of the factory-level characteristics are significant predictors of compliance after controlling for regional factors. These results support our hypothesis that local institutional features play an important role in the efficacy of private regulatory programs.

These findings are consistent with scholarship skeptical of the ability of private regulatory efforts to induce improvement in labor standards. These studies point to problems in the auditing process (O'Rourke 2002), weak punitive measures (Esbenshade 2004), and separation of purchasing decisions from monitoring functions within global buyers' organizations (Locke, Amengual & Mangla 2009). This literature suggests that the particular qualities of the monitoring system or firms have little effect on workplace outcomes. Instead, working conditions will be driven by the traditional determinants of labor and environmental practices: domestic government institutions (Reich 2007; Piore 2005; Schrank 2009).

However, in contrast to claims that private regulation is rendered irrelevant by domestic institutions, we contend that private regulation *interacts* with domestic institutions in ways that can be complementary or counterproductive. Our quantitative results show that compliance and improvement are strongly predicted by the national context of production. The following section shows how private regulation interacts with local institutions to produce these divergent outcomes. Private regulation can increase the power of existing regulatory institutions by drawing attention to violations and incentivizing management to address them to avoid state regulatory sanctions. Private regulation can also combine with independent civil society actors to offer alternative institutions of labor governance that substitute for weak government institutions. However, in the absence of both effective regulatory institutions and independent civil society, as in China, the efficacy of private regulation is severely limited.

## **Domestic institutions and regulatory impact**

Our quantitative analysis of national context drew attention to two institutions hypothesized to enhance the efficacy of private regulation: state regulatory authorities and civil society freedoms. The constructive interaction between regulatory institutions and private regulation is relatively straightforward; in the presence of the threat of fines or other disciplinary action by regulatory authorities, suppliers have greater incentive to respond to violations identified by private auditors, lest they become targets of these sanctions. In the Czech Republic, for example, information gathered by HP auditors combined with growing stringency in the regulation of workplace standards to improve conditions for vulnerable agency workers. A

similar combination of increasing state regulation and information gathered and shared by private auditors drove improvements in environmental standards as well (Locke, Pal, and Rissing 2013).

In contrast, poorly institutionalized settings lack the threat of state enforcement when auditors discover violations. This was particularly evident in the study of work hours in Chinese suppliers. On paper, Chinese employment law includes stringent protections for workers, including a 36 hour monthly limit on overtime. However, local regulators are aware that enforcing these and other regulations may adversely affect local industry. Overtime hours are a motivator for low-wage employees in China, and the ability to adjust employee overtime according to variation in demand provides plants with production flexibility without massive hirings and firings of workers. Managers in China interviewed during field visits described local labor bureaus concerned about employment figures and customer orders, in some cases facilitating worker recruitment and offering assurances that national work hours laws would not be enforced until nearly triple the legal limit.<sup>xiii</sup> The disconnect between private standards, which demand adherence to local law, and the priorities of local regulatory agencies gave these factories little incentive to comply with private regulatory demands.

It is therefore unsurprising to see greater compliance and improvement among HP suppliers in high-income countries that possess strong regulatory institutions. However, even in the absence of effective regulatory institutions, we find significant divergence in workplace outcomes between China and other developing countries that offer more robust civic freedoms. We use qualitative fieldwork in Mexico and China to illustrate how civil society can productively interact with private regulatory regimes.<sup>xiv</sup>

## **Transnational pressure and local civil society**

Mexico and China are geographically large, populous, and classified by the World Bank as “upper-middle income” countries. They exhibit similar strength of regulatory institutions, but they diverge in civil society freedoms (Table 3). In Mexico, civil society is diverse and the right to form non-governmental organizations is generally respected (although trade unions have been subject to state and employer interference). In contrast, Chinese civil society is subject to strict regulations, driving many to register as businesses or remain informal (Hildebrandt 2011). Workers seeking to organize outside of the official state-run union face not only dismissal but also harassment or imprisonment (Lee 2009).<sup>xv</sup> Field research illustrates how these differences in civil society led to different compliance outcomes.

### *Transnational Pressure and Independent Civil Society in Mexico*<sup>xvi</sup>

Electronics factories in Guadalajara, Mexico struggled with poor conditions surrounding agency workers in the mid-2000s. These included discriminatory hiring practices, in which workers were subjected to pre-hiring pregnancy screening, and repeated hiring and firing on short-term contracts to limit eligibility for benefits.

HP’s auditors identified these issues and put pressure on suppliers to improve. In response, electronics employers partnered with a local civil society organization (CEREAL) to create a collaborative dispute resolution institution. When workers registered complaints with local courts and they also reported them to CEREAL, this local NGO initiated consultations with the employer. If the NGO and employer both determined that the complaint did not violate

Mexican labor law or the EICC code of conduct, CEREAL would advise the worker to return to work. If the complaint was verified, the employer would compensate workers according to Mexican law. When disputes could not be resolved by consultation between CEREAL and the employer, they would be escalated to either the electronics industry association or the local courts.

CEREAL addressed over 4,000 worker claims in this manner, primarily related to the unfair dismissal of workers (Peterson 2010), and suppliers showed significant improvement in treatment of agency workers. By 2009, none of HP's Mexican suppliers were found in violation of the code's stipulations concerning the treatment of agency workers. This system offered a substitute for inefficient state institutions of dispute resolution. Legal resolution via courts required one to three years, whereas mediations through CEREAL took just one to three months.

#### *Transnational Pressure and "Unionization" in China*

A very different pattern emerged in China. Electronics suppliers in China were plagued by problems in work hours, emergency preparedness, safeguarding of hazardous materials, industrial hygiene, and, crucially, worker pay. Suppliers exacted disciplinary fines for worker mistakes, manipulated overtime calculations to reduce pay, and mandated worker participation in unpaid training sessions.

In response to HP pressure to improve working conditions, some suppliers in China established organizations to represent worker interests and improve communications with management. Limits on independent civil society in China meant that independent unions or labor-friendly NGOs like CEREAL were not readily available to play this role. Instead, suppliers established branches of the All-China Federation of Trade Unions (ACFTU). In the

2000s, the ACFTU expanded its membership in the private sector and among migrant workers, with national membership growing from 87 million in 1999 to 212 million in 2008 (Liu 2010). Although the ACFTU describes itself as “a representative of the interests of members and workers,”<sup>xvii</sup> its power comes primarily from its administrative status in the state rather than grassroots mobilization of its members (Chen 2009). This has permitted the ACFTU to play an important role in legislative advocacy (Chen 2009) and in some cases labor relations (Liu 2010), but field research found that labor standards violations persisted after the establishment of these unions in Chinese suppliers.

To understand why unionization in China failed to complement private regulation, it is instructive to examine a typical case. Supplier Gamma (a pseudonym) manufactured networking and wireless equipment in Shenzhen, employing roughly two thousand workers in surface-mount technology, hand assembly, and quality control processes. At the time of field research in 2009, operators received the local minimum wage of 900 RMB per month. When HP first audited Gamma in 2007, auditors found noncompliance with many labor standards. Workers were subject to wage deductions for violations of company rules. The factory failed to prevent youth workers of 16 to 18 years from working in hazardous tasks, which they are legally forbidden to perform. The factory also failed to train workers on their rights under the Electronics Industry Code of Conduct. In total, this initial audit found eight major violations and 33 minor violations of the EICC code.

The initial audit also documented the absence of a labor union, and Gamma responded by establishing its own branch of the ACFTU. However, when HP auditors returned the following year, they found that labor standards had, if anything, deteriorated since the establishment of the union. While wage deductions had been eliminated, the factory was found to be underpaying

workers for overtime. A second follow-up audit found that this underpayment had persisted, and in addition management was failing to pay workers for mandatory after-hours trainings. Youth workers continued to be engaged in hazardous tasks, night shifts, and excessive overtime work.

Whereas civil society in Mexico mediated labor disputes, Gamma's union failed to improve communications between workers and management. One year after the union was established, only 3 of 16 workers interviewed by HP auditors were even aware that the union existed. Although the factory had placed suggestion boxes in the factory, no worker feedback had been collected from them, and workers had little awareness of the labor standards established by the EICC. HP's auditors wrote: "the effectiveness of...communication channels were not obvious, such as labor union meeting was very few, no suggestion was collected from suggestion box in past half year, no worker visited the consultation team."

The union's failure to improve communication and resolve important workplace issues is in part related to its structure. Only 6% of the workforce had joined Gamma's union one year after its establishment. Auditors also noted that the union was underfunded and chaired by a Gamma human resource manager, a typical arrangement for unions in Chinese electronics. Our field researcher visited a total of thirteen electronics plants in China; six of their nine labor unions were chaired by management. One union chair knew nothing of factory labor disputes (there had been four within the last year), and another only visited worker dormitories for the first time during our research visit.

Unions in HP suppliers in China were weak advocates for worker interests, but alternative civil society partners were difficult to find. Strictures on independent civil society limit the scope of activity among China's independent labor organizations (Fu 2015), which tend to

individualize and institutionalize labor conflict rather than represent the collective interests of workers (Friedman and Lee 2010). HP did seek civil society partners beyond the official union, engaging with Students and Scholars Against Corporate Misconduct (SACOM) and two other Hong Kong-based groups to deliver trainings to several thousand workers across two supplier factories in Dongguan, China. These NGOs proposed a worker hotline to gather grievances and initiate dialogue with factory management, a project with some similarity to the collaboration with CEREAL in Mexico. However, one of the two suppliers refused to participate in the hotline, opting to maintain its internal grievance resolution procedures instead. The hotline that was established resulted in factory improvements surrounding resignation policy and dormitory conditions, yet it served just a single factory for a ten-month period (SACOM 2009, Chan 2012). In the absence of credible civil society partners, private substitutes for lax state enforcement of labor laws did not emerge in China.

## **Conclusion**

Our investigation of HP's efforts to regulate social and environmental standards among its global suppliers reveals both the possibilities and limits of private voluntary regulation. Examination of audit results showed improvements in the working conditions of suppliers worldwide. Even so, private regulation did not equalize working conditions across suppliers. While suppliers improved during HP's engagement, neither more frequent auditing nor the capability building program we examined generated greater compliance.

The most significant finding of our research is the continuing salience of local institutions in determining labor standards improvements. Analysis of audit data showed that factories in

countries with weak regulatory institutions but decent civil society freedoms dramatically outperformed factories in China, which had comparable regulatory institutions but an anemic civil society. While these findings are consistent with improvements due purely to the quality of local institutions, interviews and factory visits highlighted how these institutions *interacted* with HP's private regulatory scheme. This suggests that private compliance programs, far from substituting for or undermining public regulation (Seidman 2007), *depend* upon well-functioning national institutions and regulations to be effective. In this sense, public and private regulatory regimes may act more as complements than rivals. In the Czech Republic, HP's private regulation was aided by the threat of enforcement by state regulators, producing a complementary relationship between private and public. More provocatively, in settings with poorer enforcement capabilities, such as Mexico, local civil society can mobilize resources to address problems identified through transnational private regulation. In contrast, where both regulatory enforcement and local civil society are weak, private regulation lacks these outside resources to incentivize and support improvements. This was evident from our field research in China, the world's largest production site for global electronics.

There are several limitations to keep in mind when interpreting these findings. These complementarities between local institutions and transnational private regulation are unlikely to be exhaustive. In addition to worker advocacy NGOs, freedom of press may be another dimension of civil society development that aids private regulation by publicizing scandalous working conditions (Toffel, Short, and Ouellet 2014). Moreover, our findings come from global electronics production and rely heavily on results from mainland China, Eastern Europe, and Mexico. When applying these insights to other industries and institutional environments, we recommend beginning with a careful comparison of the local regulatory and civil society settings.

Another feature that merits future attention is the quality of buyer-supplier relations; private regulation in the absence of complementary institutions may be more effective under conditions of increased trust between buyers and suppliers. Our study also focused on first-tier, high-risk suppliers; the effects of private regulation on “upstream” suppliers or low-risk workplaces await future research. Finally, our conclusions are limited by the inability to disaggregate economic and institutional characteristics by country (with the exception of China) as well as the absence of longitudinal data that would establish baseline labor conditions prior to the introduction of the HP program.

While China is a laggard in workplace compliance during the period we study, subsequent policy changes may have improved factory labor standards. In 2008, China implemented new national laws on labor contracts and labor disputes, which appear to have curtailed trends toward informalization in urban labor markets (Gallagher et al 2015). In addition to these institutional changes, labor shortages have increased manufacturing wages in the coastal provinces that dominate exports in China. Future comparative research might examine the extent to which these trends have closed the gap in labor standards between electronics firms in China and other emerging markets.

Despite these limitations, it is important not to under-generalize from this research. As a mature approach to supply chain compliance, HP’s supplier responsibility system is an especially likely case to observe effective transnational private regulation in action. Our findings of limited improvement and the importance of local context over repeated audits or capability-building programs suggests that even under favorable conditions, private regulation requires complementarity with local institutions to be most effective. While our case studies focus on two particular countries, many in the developing country group have similarly vibrant

civil societies to Mexico and may therefore develop similarly productive interactions between transnational pressures and local civil society.

The complementarities we highlight between private regulation and local institutions offer a helpful theoretical lens for exploring the uneven success of private regulatory regimes across countries. Future research may refine our understanding of the necessary conditions for civil society groups to have the beneficial impact documented here, including the potential for any such organizations to emerge in unfavorable political terrain, like China. Future studies may also shed light on how subnational variation in local institutions drives differences in private regulatory efficacy; our mechanism predicts that stronger local institutions will enhance private regulatory efficacy.

This study illustrates how the success of transnational private regulation—and the pathways it takes to success—turn upon the economic, political, and social institutions where production occurs. Even as electronics manufacturing stretches across national borders, folding the work of many countries into a single product, workplace conditions remain tied to the domestic institutional endowments of their nation-states. How best to enhance these institutional endowments and the role that private voluntary initiatives may play in this process remain a central concern for promoting a more just global economy.<sup>xviii</sup>

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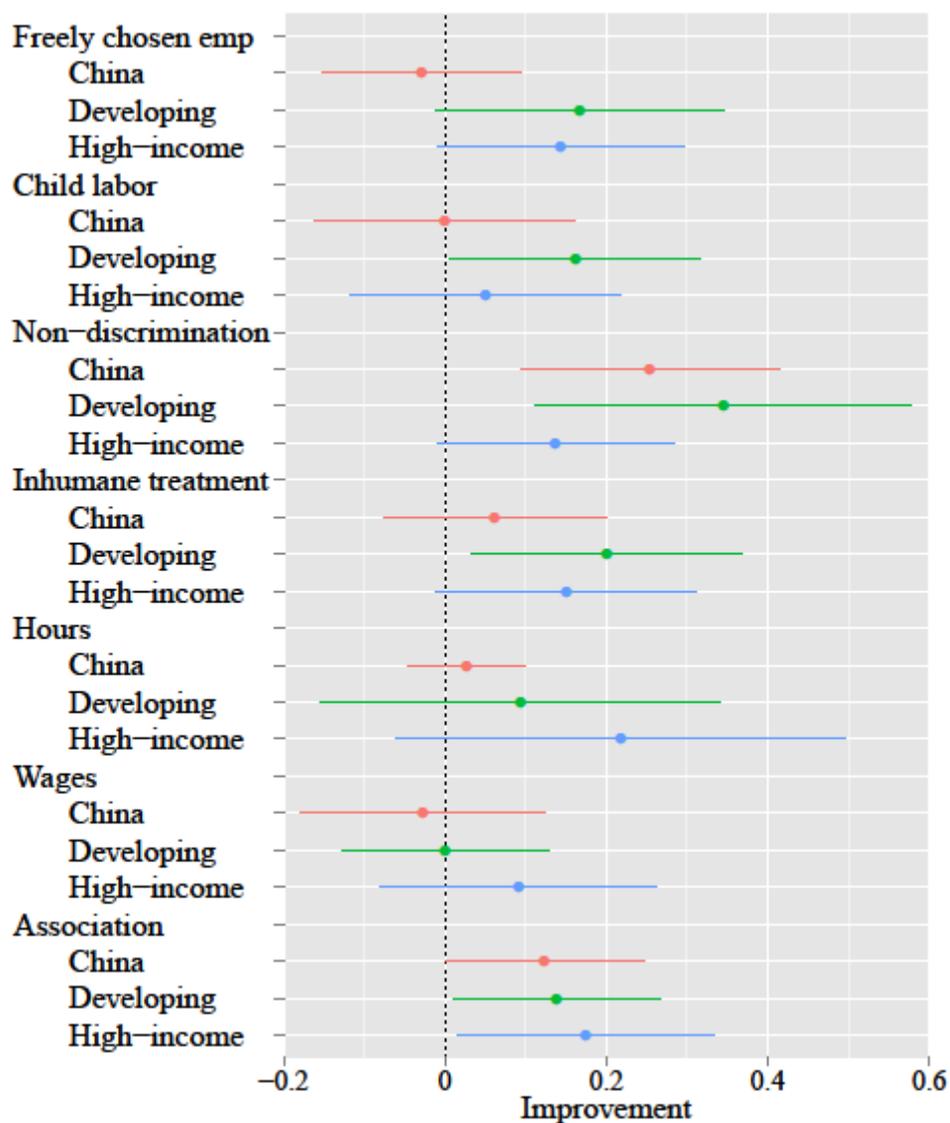
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Figure 1. Labor compliance improvement by country group



*Notes.* Estimated improvement for each item in the labor audit (by country group). Reports the estimated difference in compliance between the initial and final audits. Black lines show 95% confidence intervals from a two-tailed t-test with unequal variances. There are 77 factories in China, 34 in the Developing group, and 26 in the High-income group.

Table 1: Compliance levels assessed by HP auditors and third-party auditors

<b>Section</b>	<b>Compliance level, HP auditors (se)</b>	<b>Compliance level, third-party auditors (se)</b>	<b>Difference p-value</b>
Labor	56% (4)	51% (5)	.44
Health & Safety	44% (4)	55% (4)	.07
Environment	69% (3)	60% (4)	.14
<b>Total audits</b>	40	32	

*Notes.* Compares audit scores from 29 facilities audited by both HP's internal auditors and third-party auditors since 2006, with standard errors in parentheses. "Compliance" presents the percentage of audit items rated compliant (i.e. neither major nor minor violations). Reported p-values come from two-sided t-tests of unequal variances.

Table 2: Improvement summary for HP suppliers

Audit item	Facilities	Compliance in...		Diff.	se	pval
		first audit	final audit			
<b>LABOR</b>						
Non-discrimination	122	50%	75%	+25	(6)	.00
Freedom of association	117	81%	95%	+14	(4)	.00
Inhumane treatment	115	78%	90%	+11	(5)	.02
Working hours	130	22%	30%	+8	(5)	.16
Freely chosen employment	120	83%	88%	+5	(5)	.27
Child labor	122	58%	63%	+5	(6)	.43
Wages & benefits	126	57%	57%	0	(6)	1.00
<b>HEALTH &amp; SAFETY</b>						
Dorms & canteens	104	37%	61%	+24	(7)	.00
Occupational health & safety	116	39%	58%	+19	(6)	.00
Ergonomics	123	27%	46%	+19	(6)	.00
Occupation injury procedures	118	53%	69%	+17	(6)	.01
Machine safeguarding	121	66%	79%	+13	(6)	.02
Emergency preparedness	130	20%	31%	+11	(5)	.05
Industrial hygiene	133	40%	47%	+8	(6)	.22
<b>ENVIRONMENT</b>						
Product content restrictions	119	50%	84%	+34	(6)	.00
Pollution & resource reduction	100	79%	94%	+15	(5)	.00
Hazardous substances	128	23%	37%	+13	(6)	.02
Wastewater and solid waste	113	83%	85%	+2	(5)	.72
Air emissions	112	90%	91%	+1	(4)	.82
Env. permits & reporting	107	80%	74%	-7	(6)	.26

*Notes.* Facilities are “compliant” when they had no major or minor non-conformances in a given audit item. Latest audit compliance rates differ from those in Table 3 because this table includes only facilities audited at least twice, when both audits were conducted between 2004 and 2009. Observation counts vary because not all audit items are assessed in each audit. Standard errors and p-values from two-sided t-tests (unequal variance).

Table 3. Country groupings by economic and institutional characteristics

	N	Level of Economic Development		Regulatory institutions		Civil society		
		Per capita GDP	WB class.	WGI: Govt. Eff.	WGI: Rule of Law	WGI: Voice & Accty	FH: Association	
High-income	Singapore	8	48.5	High	2.21	1.67	-0.21	3.25
	Taiwan	3	29.2	-	1.13	0.87	0.79	10.75
	Czech	10	23.4	High	0.96	0.85	0.96	12
	Poland	1	17.9	High	0.78	0.87	1.04	12
	Hungary	4	15.5	UpM	0.47	0.44	0.91	11.75
Developing	Brazil	4	13.5	UpM	0.15	-0.52	0.16	9.25
	Malaysia	7	12.9	UpM	1.14	0.51	-0.41	5.75
	Mexico	9	9.3	UpM	-0.11	-0.39	0.46	10
	Thailand	9	7.4	UpM	0.35	-0.04	-0.39	6
	Indonesia	2	3.5	LowM	-0.33	-0.71	-0.13	8.75
	Philippines	3	3.3	LowM	-0.04	-0.50	-0.06	8.5
China	77	5.1	UpM	0.07	-0.43	-1.6	2	
<i>Averages</i>								
High-income	26	30.6		1.3	0.9	0.6	9.2	
Developing	34	9.8		0.3	-0.2	-0.1	7.7	
China	77	5.1		0.1	-0.4	-1.6	2.0	

*Notes.* Country characteristics by groupings. GDP and World Governance Indicators (WGI) are six-year averages over 2004-2009; Freedom House (FH) scores are four year averages over 2006-2009. Group means are weighted by the number of factories in each country. This table lists factories audited at least twice, which provide the basis for the analyses that follow. GDP per capita based on purchasing-power-parity (PPP) from International Monetary Fund, World Economic Outlook Database, October 2013. World Bank classification: lower-middle income, upper-middle income, high-income. The World Bank does not classify Taiwan on this scale.

Table 4. Institutional features by country groups

		<i>Civil society freedoms</i>	
		<i>High</i>	<i>Low</i>
<i>Regulatory Institutions</i>	<i>High</i>	<b>High-income</b>	
	<i>Low</i>	<b>Developing</b>	<b>China</b>

Table 5. Compliance scores, regions, and factory characteristics

	Labor		Health and Safety		Environment	
	(1)	(2)	(3)	(4)	(5)	(6)
Developing	.30*** (.05)	.26*** (.06)	.29*** (.05)	.31*** (.06)	.16*** (.04)	.13*** (.04)
High-income	.40*** (.04)	.40*** (.04)	.27*** (.07)	.29*** (.07)	.13** (.05)	.12** (.05)
<i>(Reference region: China)</i>						
Total audits		-.05 (.03)		-.06* (.04)		-.00 (.03)
Capability-building		.04 (.08)		.11 (.08)		-.05 (.07)
High value-added		-.01 (.05)		.00 (.05)		-.06 (.04)
Top 100 supplier		.01 (.05)		.03 (.06)		.02 (.04)
Supplier CSR report		.03 (.06)		.07 (.06)		.07 (.05)
High-season		-.04 (.04)		-.00 (.05)		-.00 (.04)
Year fixed effects		✓		✓		✓
Constant	.54*** (.03)	.79*** (.10)	.44*** (.03)	.63*** (.12)	.69*** (.03)	.84*** (.09)
Observations	137	134	137	134	137	134

*Notes.* OLS estimates with robust standard errors in parentheses. Note that for three plants we had no data on high-value added production; they are dropped from the full models. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Endnotes

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- <sup>i</sup> Duhigg, Charles and David Barboza. “THE iECONOMY: In China, Human Costs Are Built Into an iPad” *The New York Times*. Jan. 25, 2012. Page A1.
- <sup>ii</sup> These rankings are reported by revenue and published in Fortune Magazine. In 2011 HP reported revenues in excess of USD 127 billion.
- <sup>iii</sup> IDC Worldwide Quarterly PC Tracker, January 12, 2011.  
<http://www.idc.com/getdoc.jsp?containerId=prUS22653511>
- <sup>iv</sup> The HP Code of Conduct can be accessed online:  
<http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/supcode.pdf>
- <sup>v</sup> Interviews with HP regional Social and Environmental Responsibility managers, 2008-2010.
- <sup>vi</sup> Detailed tables of compliance scores are available in the online appendix. Our analysis focuses on the labor, health and safety, and environmental sections of the EICC Code, since these represent the most direct measurements of workplace conditions. Audit sections on general adoption of the Code, management systems, and ethics practices are not analyzed here.
- <sup>vii</sup> One possible reason wages and benefits compliance have stagnated has to do with increasing stringency in the audits. In China, auditors realized that many plants mandated employees arrive early or stay after hours for “trainings” without proper overtime compensation. These notes appear only in later audits, indicating that this received scrutiny only later in the audit process. To the auditors’ credit, they appear to be increasing pressure over time, in accordance the commitment to “raising standards” set forth in HP’s 2009 Global Citizenship Report.
- <sup>viii</sup> Although the WGI indicator “Regulatory Quality” sounds more relevant, in fact it primarily measures the burden of government regulation on businesses, as opposed to the effective and fair implementation of government policy.
- <sup>ix</sup> See Freedom House report methodology for more detail:  
<http://www.freedomhouse.org/report/freedom-world-2014/methodology>
- <sup>x</sup> Running contrary to the global value chain literature are theories drawn from the international political economy field suggesting that the cost pressures inherent to subcontracting relationships lead to a race-to-the-bottom in supplier labor rights (Mosley & Uno 2007; Mosley 2011). This approach anticipates the opposite effect of commodity production; suppliers in more competitive (i.e. commoditized) markets should exhibit lower compliance with HP’s private regulatory standards as market pressures drive costs and labor standards downward.
- <sup>xi</sup> High value-added production may also involve high-skill jobs that naturally enjoy higher labor standards. However, in our visits to electronics factories, we found large numbers of low-skill production operators in both low- and high-value added production. Therefore, we do not expect variation in worker skill associated with high value-added production to confound our estimates here.
- <sup>xii</sup> Indeed, a locally weighted regression (lowess) of compliance scores over time, available in the online appendix, shows a roughly linear increase in audit scores over time.

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- <sup>xiii</sup> Interviews with supplier Human Resource Managers, 2009. Note, however, that the differences between China and the developing countries are not entirely driven by China's stringent work hours regulations. The effects estimated in Table 5 are robust to the exclusion of the work hours audit item from the analysis.
- <sup>xiv</sup> Researchers participating in this project visited 45 supplier facilities in China (13), the Czech Republic (9), Hungary (6), Mexico (7), Malaysia (1), Singapore (3), and Thailand (3).
- <sup>xv</sup> Freedom House, "Freedom in the World 2012."  
<http://www.freedomhouse.org/report/freedom-world/freedom-world-2012>
- <sup>xvi</sup> The Mexico findings summarized here also appear in greater detail in Locke, Rissing, and Pal (2013).
- <sup>xvii</sup> ACFTU Website. <http://www.acftu.org/template/10001/file.jsp?cid=804&aid=42616>  
Accessed April 23, 2014.
- <sup>xviii</sup> One innovative initiative is the International Labor Organization's Better Work program, which combines monitoring with capability-building surrounding employee participation and worker-management communication (Oka 2009).  
<<<http://www.betterwork.org>>>