Do code of conduct audits improve chemical safety in garment factories? Lessons on corporate social responsibility in the supply chain from Fair Wear Foundation

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Background: In managing chemical risks to the environment and human health in supply chains, voluntary corporate social responsibility (CSR) measures, such as auditing code of conduct compliance, play an important role.

Objectives: To examine how well suppliers' chemical health and safety performance complies with buyers' CSR policies and whether audited factories improve their performance.

Methods: CSR audits ($n = 288$) of garment factories conducted by Fair Wear Foundation (FWF), an independent non-profit organization, were analyzed using descriptive statistics and statistical modeling.

Results: Forty-three per cent of factories did not comply with the FWF code of conduct, i.e. received remarks on chemical safety. Only among factories audited 10 or more times was there a significant increase in the number of factories receiving no remarks.

Conclusions: Compliance with chemical safety requirements in garment supply chains is low and auditing is statistically correlated with improvements only at factories that have undergone numerous audits.

Keywords: CSR, Code of conduct, Audit, Voluntary regulation, Health and safety, Chemicals, Solvents

Introduction

Economic globalization has sparked intense debate on how to regulate the impacts of increasingly global supply chains on people and the environment. Areas such as chemical health and safety in the workplace have long been controlled mainly by public regulation, but with increasingly global supply chains, voluntary private initiatives have become more important. The corporate social responsibility (CSR) concept has a central role in this debate and is regularly emphasized as an effective way to meet these challenges. In practice, since the early 1990s, multinational corporations have attempted to improve conditions at their suppliers via CSR policies. This has meant adopting codes of conduct with minimum requirements for suppliers, and auditing suppliers to ensure compliance and improved performance regarding these social standards.^{1,2} The emphasis has been on suppliers in developing countries,³ where the implementation of public regulatory systems is often weak.⁴

While some researchers argue that voluntary CSR measures hold great promise for improving workers' conditions in global supply chains,⁵⁻⁷ other researchers and civil society organizations claim that these measures are little more than public relations tools allowing companies to gain legitimacy while barely improving working conditions.⁸⁻¹¹ Still others question whether the voluntary measures taken by companies actually uncover the problems regarding working conditions,¹² and whether they manage to resolve the issues that they do find.^{13,14}

In this article, we will test two central aspects of assumptions made by CSR practitioners as well as hypotheses derived from research to date on code of conduct auditing of working conditions in the supply chain. The main contribution of this research is testing present theories on a unique data-set of audits done by an independent multi-stakeholder organization.

Previous research into code of conduct audits in supply chains

Voluntary CSR measures in supply chains are currently among the most researched areas in CSR. Research has mainly examined codes of conduct – the most common

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type of CSR instrument. Research themes include the degree of corporate adoption of codes,¹⁵ content of codes from a normative perspective,¹⁶ content of codes from a descriptive perspective,^{17,18} and drivers of code adoption.^{18,19} Still, researchers have been slow to follow codes of conduct to the factory floor where they are supposed to make a difference, although studies are now emerging that have started to address this.^{20–23} Research suggests several interesting lessons in relation to code of conduct implementation. In the following paragraphs, we outline previous findings and formulate the hypotheses tested in this study.

The legitimacy of CSR in the supply chain hinges on the empirical question of whether or not voluntary CSR measures improve working conditions on the factory floor. Despite its importance, few studies have addressed this question systematically.²⁴ Existing research into code of conduct implementation does not give a clear answer, but indicates that the adoption of codes of conduct and code auditing do not automatically or easily generate major changes at the point of production.^{13,25} Even when improvements have been identified, authors stress that it is difficult to attribute the improvements made to the CSR activities.^{26,27} Systematic studies of code of conduct implementation have varied results when it comes to establishing whether code implementation leads to improvements. For example, Locke et al.'s²⁵ study of Nike's suppliers found that, over time, almost half did not improve their compliance, 36% actually experienced a decline in compliance, and only approximately 20% improved. In contrast to this, more recent studies paint a more positive picture, these includes studies of Hewlett Packard suppliers,²⁸ garment factories in the International Labour Organization (ILO) Better Factories program in Cambodia,²⁹ and studies of the Indonesian garment, footwear and electronics industry.²² Based on the results of this previous research, we formulated our first hypothesis: Suppliers subjected to auditing of working conditions would improve over time.

Several studies have looked into differences in compliance and improvement rates to understand the context and conditions under which code compliance improves. Both Locke et al.²⁵ and Oka²⁹ investigated how supplier size and age were correlated with code compliance. Locke et al. found that supplier size was negatively correlated with compliance, while Oka found a positive relationship between size and compliance. Oka and Locke et al. also argued that newer factories might be better organized and hence have better compliance than older factories, something Oka did not find support for in her data from Cambodian factories. Locke et al. also found that suppliers with well-functioning management systems, such as ISO 9001, were better equipped to comply with codes of conduct. Hence, code of conduct compliance seems related to supplier characteristics.

Furthermore, several authors have found that the type of buyer–supplier relationship shapes code of conduct

compliance.^{25,30} The largest study investigating this is Oka's analysis of factory surveys in the ILO's Better Work program in Cambodia.²⁹ The study tests both a "long-term relationship hypothesis," which predicts better compliance when there is a longer relationship, and a "market-based relationship hypothesis," which predicts better compliance where there is closer cooperation between suppliers and brands. Oka found that market-based buyer–supplier relationships mediated by agents, i.e. when the supplier is located further from the brand, were associated with poorer working conditions. Similarly, Lim and Phillips³¹ argued, based on a study of Nike's Chinese and Vietnamese suppliers in the early 2000s, that codes of conduct could improve workers' rights if buyer–supplier relationships were transformed from arm's length to collaborative relationships. In addition, it is a common perception among corporate managers and civil society organizations that suppliers where the buyers have direct contact instead of going through an agent will be more compliant.

Lastly, Toffel et al.³² examined what institutional conditions in a country (country characteristics) support adherence to codes of conduct in his large-scale comparative study of factory audits. The results indicate that compliance with codes is strongly correlated with a country's domestic and international legal commitments in combination with press freedom and activity of nongovernmental organizations. The importance of national context has also been demonstrated in Locke's^{21,28} and Distelhorst's^{21,28} examinations of HP's suppliers.

Based on the above-mentioned research on the conditions under which factories improve, we formulate our second hypothesis: Supplier characteristics, the buyer–supplier relationship, and country characteristics can predict code of conduct compliance.

Gaps in research

Most existing studies on code of conduct audits are based either on qualitative examination of a limited number of suppliers or on quantitative examination of supplier performance in the aggregate. Some of the more notable systematic studies of CSR compliance have analyzed suppliers' aggregate performance relative to contextual issues such as country data and the characteristics of and relationships between supplying and buying companies. Examples of such studies include the previously mentioned examination of over 800 of Nike's suppliers by Locke et al.,²⁵ Oka's analysis of 300 Cambodian factories in the Better Work program of the ILO,²⁹ and Toffel's analysis of 31,915 code of conduct audits.³² These studies do not individually analyze specific non-compliances such as excessive overtime and health and safety violations, but instead focus on the aggregate performance of the factories.²⁵ Determining the effect of CSR on the factory floor therefore calls for studies that go beyond both individual factories and the analysis of factory performance in the aggregate.^{20,22,25,33}

Stakeholders, as well as previous research, have questioned the reliability of corporate-driven audits or audits conducted by organizations subject to strong corporate influence that have been used in much of the previous research.^{10,34} Furthermore, several studies have demonstrated that auditing can be unreliable when it comes to uncovering issues regarding discrimination, freedom of association, wage payment, and working time,¹² but that the visible working environment in the factory is one area where audits do identify risks to workers.¹⁰

To address these shortcomings, we analyze 288 code of conduct audits of garment factories to investigate their impact on chemical health and safety. All audits have been conducted by the independent multi-stakeholder organization Fair Wear Foundation (FWF). The nature of this organization, as well as the audit methodology employed by it, makes the data different from corporate-driven audits used in previous research. The garment industry provides a suitable empirical setting for examining the effects of voluntary CSR measures, as it is one where code of conduct auditing is most mature and should therefore be an industry where positive impacts are identifiable. We focus on chemical health and safety for workers because it is central to CSR,³⁵ and as previous research has argued that health and safety is one area where we should expect CSR to have the greatest impact.^{22,27} Even critical evaluations of the health and safety impact of CSR in light of recent factory disasters state that improvements, albeit often not sustained for the long term, have been made regarding issues such as visible safety hazards and availability of protective equipment.^{11,14} The detail of the audit reports used in this study allows us to follow individual non-compliances within a very specific area such as chemical health and safety.

Chemical risk in garment factories

Chemical health and safety was chosen because it is an area where we expect to see improvements and because it is important for the health of employees. The ILO lists exposures to organic solvents in the garment industry as a serious health concern for workers.³⁶ An estimated 13 million people worldwide work in the garment industry³⁷ and risk exposure to solvents during spot-removing operations. This exposure risk is compounded by long working hours, identified as a major area of concern in garment factories, which increase both workers' exposure to chemicals and their accident risk.^{38,39}

This study includes garment factories where the main activities are cutting, sewing, quality control, and packing. The major chemical health and safety risk in these factories arises during spot removing. During production, garments and textiles are checked for spots and stains, commonly grease or oil from machinery, and these stains are often removed in open floor spraying areas and inspection stations using various solvents.⁴⁰

Commonly used solvents in spot-removing operations include perchloroethylene, methylene chloride, n-hexane, and trichloroethylene.⁴¹ According to information in the European Chemicals Agency's classification and labeling inventory database, these chemicals are classified as having several potential negative health effects. Trichloroethylene is classified as a mutagen and carcinogen that may cause dizziness as well as skin and eye irritation.⁴² Perchloroethylene and methylene chloride are both classified as possible carcinogens.⁴² N-hexane may be fatal to humans, is toxic to aquatic life, causes skin irritation, is suspected of damaging fertility and the fetus, and may damage the nervous system through prolonged or repeated exposure.⁴² Attempts have been made to substitute solvents with ones having less serious environmental or health impacts, but this has proved difficult as spot removing requires a chemical that has good spot-removing properties, dries rapidly, and has low flammability.⁴⁰ Additional chemicals mentioned in relation to spot-removing operations in the FWF audit reports include, white petrol, diethyl ether, and thinner (without specifying which thinners).

International efforts have been made to tackle the health and safety risks arising during spot-removing operations, for example, as part of the ILO project Better Factories set up in 2001 to promote decent working condition in garment factories. In its material, the ILO identifies worker training, providing information to workers on chemicals used, correct use of personal protective equipment (PPE), minimizing exposure through ventilation and the separation of the spot-removal area, and safe storage of chemicals as concerns in garment factories.^{43,44}

Material and methodology

The audits: FWFs independent verification

The data obtained from FWF consist of 288 audit reports from audits conducted at 229 garment factories between 2004 and 2012. FWF publishes summaries of audit results in their reviews of their member brands, however, for the purpose of this study, they provided us with the full audit reports for all audits conducted in the mentioned time period. The audit reports were anonymized (the name of the factory and the FWF member company had been replaced by numbers).

FWF and its audit methodology is described in detail to demonstrate why FWF's audit results can be considered independent and reliable, i.e. not controlled or influenced by the brand companies or factories. FWF is a European non-profit multi-stakeholder organization that independently verifies working conditions in the European companies' supply chains where the main activity is sewing. The charter of the organization states its objective as verifying the efforts made and results achieved by affiliates [i.e. member companies] ... towards the implementation of the Code of Labour [i.e. code of conduct] Practices step-by-step, in the company's internal management system

as well as in the factories where their products are manufactured.⁴⁵ The FWF code of conduct, which all member companies are to implement at supplier factories, is based on relevant ILO conventions and covers eight areas: forced labor, discrimination, child labor, freedom of association and the right to collective bargaining, wages, working hours, safe and healthy working conditions, and employment relationship. Especially relevant to this research is the section on health and safety, which states that:

A safe and hygienic working environment shall be provided, and best occupational health and safety practice shall be promoted, bearing in mind the prevailing knowledge of the industry and of any specific hazards. Appropriate attention shall be paid to occupational hazards specific to this branch of the industry and assure that a safe and hygienic work environment is provided for. Effective regulations shall be implemented to prevent accidents and minimise health risks as much as possible. (following ILO Convention 155)⁴⁵

FWF's claim to be independent of its affiliated companies is supported on the organizational level by its multi-stakeholder ownership structure. FWF's board and ownership are divided equally between industry organizations (not individual companies), on one hand, and trade unions and human rights organizations, on the other.⁴⁵ The organization furthermore limits the risk of undue influence from individual companies through multi-stakeholder funding, i.e. obtaining funding from parties representing various stakeholder groups.⁴⁶

FWF member companies are themselves responsible for monitoring their own supply chains, while FWF is responsible for checking the quality of member companies' monitoring work, the FWF factory audits being part of this effort. FWF audits the factories of member companies' suppliers to control the quality of members' monitoring activities, to follow up or investigate complaints filed by workers at factories, and to verify working conditions at randomly chosen factories.⁴⁷ Member companies can also pay FWF to conduct additional audits in addition to those conducted by FWF for verification purposes.

The FWF audit methodology was originally developed in 2004 and is outlined in FWF's audit manual from 2005.⁴⁸ It has since been revised, but has retained its core features. All audits are conducted by three local experts who specialize in one of the following fields: worker interviews, health and safety, or inspection of records and documents. The audits are preannounced, but workers are interviewed offsite before the audit without the involvement of factory management. In addition, local stakeholders are interviewed to learn more about the conditions in the area where the factory is situated. During the audit, information is gathered from interviews with management and workers and from inspection of documents, records, and production facilities. With the help of these five sources of information (i.e. stakeholders, workers, management, documents, and inspection of facilities), it is decided whether the factory is complying with local

legislation and the FWF code of conduct. In most cases, nine and a half person-days are required per audit of a factory with 50–500 workers.⁴⁸

The buying companies: the FWF members

The 80 small- and medium-sized companies affiliated with FWF at the beginning of 2012 represent approximately 120 brands in the fashion, workwear, and outdoor sectors. When a company joins FWF as a member, it is required to sign an agreement with FWF including the code of conduct, submit a work plan showing how it will implement the code at its suppliers, and submit a register of all its suppliers.⁴⁹ The framework set out in the FWF Manual for Affiliates stipulates that the FWF code of conduct should be signed by all suppliers, that members should require suppliers to complete a questionnaire on code compliance and to post the code in their factories, and that members should audit their suppliers and follow up any corrective actions required after the audits. This approach is similar to how most other brand companies in the sports footwear, apparel, and retail sectors have been described as implementing CSR in the supply chain.²

The coding of audit reports

The audit reports received had been anonymized by FWF and were then coded by the authors. For the aspects of chemical health and safety, the information was coded by two people independently of each other. When differences in coding were found, the reasons were identified (i.e. either keyboarding errors or information oversight) and consistent values agreed on.

If data were lacking or inconclusive regarding a particular variable, the audit report was not used for the analysis of this variable. When coding for auditing intensity, we used broad categories as FWF auditors had often not recorded the exact number of previous audits. From the audit reports, we were able to divide this variable into four categories: no previous audit, one previous audit, two to nine previous audits, and ten or more previous audits.

To code the data on chemical health and safety performance, non-compliances in the corrective action plans were categorized into 17 specific types (Table 1). The non-compliances are formulated by each auditor, and wording can differ between audits. An example of a remark is: "Chemical handling in the facility found unsafe, no separate chemical store, unlabeled chemical container kept inside old dyeing unit, no Material Safety Data Sheet (MSDS) posted near chemical using area, eye wash point not available near chemicals." This remark was coded as "storage of chemicals needs improvement," "missing MSDS or safety labels," and "personal protective equipment not available for workers handling chemicals."

To determine the most common categories of non-compliance, the non-compliances were grouped according to theme. For example, the four non-compliances "Missing

Table 1 Remarks on chemical health and safety non-compliances found in the first FWF audits of supplier factories

Remarks on chemical health and safety non-compliances	No. of factories	% of factories
<i>Issues with MSDS or labeling of chemicals</i>	72	31
Missing MSDS or safety labels	65	28
MSDS in language workers do not understand	8	3
Unlabeled chemicals in the workplace	6	3
Chemicals kept in unlabeled water bottles (or risk of mixing with drinking water)	5	2
<i>Storage of chemicals</i>	43	19
Storage of chemicals needs improvement	24	10
Secondary leakage container for chemicals missing	18	8
No explosion-proof lighting where chemicals are stored	4	2
<i>Training and organizing</i>	27	12
Workers have not received the required training to handle chemicals	27	12
No person designated to take care of chemicals (or confusion regarding responsibilities)	3	1
<i>Remarks on personal protective equipment (PPE)</i>	31	14
PPE not available for workers handling chemicals	16	7
PPE not used when needed	13	6
Incorrect PPE provided to workers handling chemicals	4	2
<i>Ventilation and placement of spot-removal section</i>	20	9
Placement of spot-removal section in the workplace	8	3
Remarks on ventilation in areas with chemical fumes	17	7
<i>Required safety checks not done</i>	4	2
Levels of chemicals not measured when required	2	1
No health checks conducted when required because of chemical risks associated with work tasks	2	1
<i>Banned chemicals are being used</i>	1	0

MSDS or safety labels,” “MSDS in language workers do not understand,” “Unlabeled chemicals in the workplace,” and “Chemicals stored in water bottles (or risk of mixing with drinking water)” were grouped into the category “Issues with MSDS [material safety data sheet] or labeling of chemicals.”

The audited factories

The majority of the 229 studied factories were situated in China (56%), with India (9%) and Turkey (8%) in second and third place. The rest of the factories were distributed among the following 11 countries: Vietnam (6%), Macedonia (5%), Bangladesh (4%), Tunisia (4%), Romania (2%), Poland (2%), Bulgaria (2%), Ukraine (1%), Thailand (1%), Laos (1%), and Moldova (0.5%).

The audited factories range from small workshops of four workers to factories of five thousand workers, with the average number of employees being 404 (median 230, $n = 227$, $SD = 545$). The factories have been in operation for an average of 11 years, with a range from newly opened to 87-year-old factories (median = 8.0, $n = 221$, $SD = 9.6$). Eighty-eight per cent of the factories audited are direct suppliers of the buying companies.

One hundred and fifty-six (68%) of the factories were audited one or more times by other organizations or companies when FWF audited them the first time. Forty-three (19%) of the factories were audited multiple times by FWF, making it possible to study improvements achieved by the factories after the first audit.

Seventeen types of remarks regarding chemical health and safety were found in the corrective action plans of the audits ($n = 288$). The non-compliances range from missing MSDS to inappropriate PPE use and unsafe chemical storage (the full list of non-compliances is presented in Table 1).

At the time of the first FWF audit of the factories, 43% (98) of the 229 factories received remarks on chemical health and safety: 12% (28) of the factories received one remark on chemical health and safety, 17% (39) two remarks, 8% (18) three remarks, 2% (4) four remarks, 2% (5) five remarks, and 2% (4) more than five remarks. The most common chemical health and safety non-compliance issue concerned MSDS or the labeling of chemicals, on which a third of the factories received remarks, while a fifth of the factories received remarks on how they stored chemicals. The third most common area of non-compliance was PPE, on which 14% of the factories received remarks.

Data analysis

To test both hypotheses, a binary logistic model containing independent variables for factory characteristics, buyer–supplier relationship, auditing intensity, and country characteristics was constructed. In this model, chemical health and safety was coded as a binary variable, where zero represents no remarks and one represents one or more remarks. If multiple FWF audits had been conducted at a supplier, data on chemical health and safety compliance from the most recent audit were used.

The model contained three independent variables for *supplier characteristics*, total number of employees (measured in hundreds), years of operation at the time of audit and factory ISO9000 certification, and two variables of *buyer–supplier relationship*, supplier tier (first or second tier), contact between company and supplier (direct or via an agent), and two variables for *country characteristics*, World Bank rule of law index for the country of domicile, and the country’s GDP per capita. Values for the two latter were obtained for the relevant year from the World

Table 2 Binary logistic model of likelihood of receiving no remarks on chemical health and safety (n = 221) containing independent variables for previous audits, supplier characteristics, buyer–supplier relationship, and country characteristics

	B	SE	Odds ratio	p
<i>Supplier characteristics</i>				
Number of employees (100s)	0.044	0.032	1.045	0.169
Years of operation at time of audit	0	0.015	1	0.99
ISO certified (Ref. not certified)	−1.175	0.661	0.309	0.075
<i>Buyer–supplier relationship</i>				
First-tier supplier (Ref. second tier)	−0.216	0.553	0.806	0.696
Direct contact w. supplier (Ref. contact via agent)	0.565	0.423	1.759	0.182
<i>Country characteristics</i>				
Rule of law index	−0.346	0.705	0.707	0.623
GDP per capita (USD 1000s)	−0.115	0.074	0.891	0.118
<i>Number of previous audits</i>				
One previous audit (Ref. previous audit)	0.177	0.412	1.193	0.667
Two to nine previous audits (Ref. previous audit)	−0.385	0.376	0.681	0.307
Ten or more audits (Ref. previous audit)	−1.612	0.653	0.199	0.014

Bank website.⁵⁰ The model also contained an independent variable for number of previous audits of the factories. As this was not always written down in a way that a precise number could be given, this was divided into four categories, no previous audit done at the factory, one audit done previously, two to nine previous audits, and more than nine previous audits. The coding of this variable took both audits done by FWF and organizations into account.

A second statistical test was conducted to test our first hypothesis. This was done by analyzing only results from the factories where FWF had conducted two or more audits. This meant looking exclusively at repeated FWF audits where there was consistent audit methodology and quality. In this way, we could monitor each corrective action and test whether there was significant improvement from the first to the second audit.

Results

The overview of non-compliances outlined in Table 1 shows that the ambitious health and safety goals set out in the FWF code of conduct were not met. However, as FWF and its member companies use a process approach (i.e. the requirement is that progress is made), the main question is whether improvements were achieved when non-compliances were found. This is investigated further below.

The logistic regression model consisting of the independent variables for number of previous audits, factory characteristics, buyer–supplier relationship, and country data was significant as a model (model χ^2 22.46, df = 10, P = 0.013, n = 221) (Table 2).

However, none of the independent variables in this model regarding buyer–supplier relationship, supplier characteristics, or country characteristics were significant. Of the three dummy variables created with “no previous audits” as the reference, only the variable “ten or more audits” was significant (B = −1.612, P = 0.014, odds ratio = 0.199).

The second statistical test conducted to test our first hypothesis was done on the 43 factories audited more than once by FWF. Of these factories, 23 (53%) received remarks on chemical health and safety. Although 13 (30%) of these factories improved by the time of the second audit (i.e. receiving fewer remarks on chemical health and safety), two (5%) did not improve (i.e. received the same number of remarks at the second audit) and eight (19%) decreased in performance. The difference in compliance between the first and second FWF audits was not statistically significant when tested (Fisher–Pitman permutation tests for paired replicates, two-sided P -value = 0.12).

Discussion

The audit reports examined show that the ambitious aims of the FWF code of conduct were achieved on the factory floor. In our sample, 43% of factories did not comply with basic health and safety precautions in the handling of chemicals. At a first glance, our results lend some support to the first hypothesis that code of conduct audits improves factory health and safety performance over time. Our results indicate that factories that underwent many audits perform better than those that have undergone few or no audits, indicating that audits can lead to improvements. However, this higher compliance could only be detected at factories that had undergone 10 or more audits. In line with this result, we could not detect significant improvements from one audit to the next in factories where FWF had conducted multiple (but less than ten) audits. These results can be contrasted with the ongoing discussion among CSR practitioners of excessive auditing and “audit fatigue”, i.e. the risk that the burden of repeated audits may divert factory resources from being used to make actual improvements.^{25,51–53} Our results show that only in factories where there was a risk of management’s experiencing audit fatigue could we detect improvements that were statistically significant.

The results of this study call into question the assumptions of hypothesis 2 and question the relevance of the characteristics of suppliers and the buyer–supplier relationships that previous research has suggested are correlated with supplier compliance levels. According to our results, low compliance cannot easily be attributed to certain types of supplier (e.g. a small supplier that does not have a structured management system such as ISO9000) or to certain buyer–supplier relationships (e.g. short-term cooperation or a long supply chain). In line with this, we were also unable to confirm that the country characteristics associated with higher compliance levels in previous studies, such as that of Toffel et al.,³² correlated with better performance in the countries studied.

As previous research has questioned whether audits properly identify more complex issues, we chose to focus on chemical health and safety, an issue in the physical working environment that should be easily identified during an inspection. The low detected compliance levels and the audits' weak ability to produce improvements raise concerns about other areas covered by codes of conduct that are not investigated here. Previous research has stressed that outcome issues such as health and safety are areas where codes should be able to make a difference, as opposed to more difficult areas such as freedom of association and discrimination.²⁷ In other words, if code of conduct audits, as we have demonstrated, struggle to improve chemical health and safety, they are also likely to struggle to improve working conditions at factories more generally.

As companies see code of conduct auditing as an important tool to facilitate factory performance improvements,⁵⁴ this CSR measure is likely to continue to play a major role in attempts to secure decent working conditions in global supply chains. We therefore need to look at the conditions under which this seemingly ineffective measure could be made to improve working conditions. CSR in general and code of conduct audits in particular have largely not engaged with what are often seen as the three pillars of health and safety, namely governments, employers, and workers.¹⁴ At the level of the employer, i.e. the supplier's management, engagement seldom goes beyond presenting a list of non-compliances from the audit to be corrected. Interestingly, pilot projects in which companies have engaged employers at the supplier level to introduce better management systems have produced positive results.^{55,56} When it comes to engaging government, evidence indicates that CSR measures have the most potential to create improvements when they complement public regulations,^{21,57} but how this should be done in practice by companies has not been shown. Lastly, in the case of engaging workers, CSR has largely failed to involve or empower them in improvement work.^{22,34,58} Again, research demonstrates that increasing workers' ability to raise concerns is instrumental in achieving improvements at the factory level.³⁴

Study limitations

A challenge in this study, as in other studies relying on audit data, is the lack of a control group, i.e. a group of factories not subjected to any code of conduct. It is therefore impossible to draw conclusions as to the possible effect of a supplier's signing a code of conduct. A positive effect could occur even before the first audit, for example, as suppliers could decide to improve their health and safety practices when first presented with a code of conduct and therefore perform better than factories not exposed to the CSR policies of buyers. However, our data do give us a measure of how well code of conduct audits, i.e. the main tool for the follow-up of CSR in the supply chain, correlate with better working conditions, as they allow us to compare factories subjected to different numbers of audits with the control group of factories that have never undergone an audit.

A weakness of our data-set is that we were unable to include in our analysis characteristics of the buying company, i.e. the company enforcing the code of conduct. As other research has demonstrated that buyer characteristics, such as membership in a multi-stakeholder organization, can positively influence compliance, this could have been included in the model created.²⁹ Another area of buyer characteristics that merits investigation concerns the CSR ambitions and efforts of the buying company, which should be measured to determine whether they affect improvements in working conditions after an audit. This effort could address how well CSR practices are embedded throughout the buying company, as previous research has indicated that this is important.⁵⁹ To investigate the effect of the buying company, we would also need to find ways of measuring how buying companies incentivize factories to improve their performance after the initial audit.

Conclusions

In this paper, we have demonstrated that in the garment sector, an industry with long experience of CSR measures implemented in supply chains, codes of conduct is not mirrored in factory-level practices. This would not be cause for alarm if codes of conduct and auditing had improved working conditions over time. However, our results indicate that such improvements are likely to be hard earned, as only after 10 or more audits did suppliers improve their chemical health and safety performance.

For research to provide answers as to how CSR measures can be more effective, it should consider how to complement the actions of and engage with government, employers, and workers. For companies this might also provide attractive solutions, as training workers and suppliers and complementing existing regulatory mechanisms might prove more effective, in terms of both results and costs, than performing a second or third audit of a supplier.

Disclosure statement

Henrik Lindholm was employed as international verification coordinator at FWF from February 2009 to January 2012. The other authors declare no competing interests.

Funding

The research was funded by the Royal Institute of Technology and the Jan Wallanders and Tom Hedelius foundation.

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