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The Role of Insurance Agents in the Prevention of Environmental Loss and Damage

by

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A Thesis Submitted in Partial Fulfillment of the Requirements for the
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College of Liberal Arts

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Abstract

Over the past several decades, businesses have been placed under great pressure from government and the public to avoid environmental loss and damages. To mitigate environmental loss and damages, companies purchase environmental insurance, which protects companies from direct financial liability and transfers the risk to the insurance agency. Thus, insurance companies have a vested interest in preventing payouts to businesses by ensuring that their clients protect against environmental losses.

Past literature in the field of environmental management has paid little attention to the role of insurance companies and their agents in the prevention of environmental loss and damage. However, there is anecdotal evidence that insurance agents can play an active role in helping firms identify and prevent environmental health and safety issues. Focusing on the printing industry, this study aims to better understand the role insurance agents play in helping firms manage their environmental performance. This study found that insurance companies view themselves as institutions that enhance environmental health and safety performance of manufacturing facilities by preventing environmental health and safety risks. However, it is not clear that printing firms likely do not believe insurance companies contribute to preventing environmental health and safety risks at their facilities. Thus, while there is potential for insurance companies to act as non-public governance institutions that regulate and improve the environmental performance of firms, this potential may not be being realized to its fullest extent.

Chapter 1 Introduction

Over the past several decades, businesses have been placed under great pressure from government and the public to avoid environmental loss and damages. To mitigate environmental loss and damages, companies purchase environmental insurance that protects them from legal liability and transfers the risk to the insurance agency. Thus, insurance companies have a vested interest in preventing payouts to businesses by ensuring that their clients protect against environmental loss and damage.

There are several viewpoints on environmental health and safety liability in business. Economists have the opinion that legal liability is the legal-bound obligation to pay debts (O'Sullivan 2003). Manufacturers and the court system of the United States view business legal liability as the responsibility of a company for an event, not as a financial obligation (Garner 2014). The latter is the viewpoint that this study will take in discussion of liability.

Firms are internally motivated to reduce legal liability. The threat of liability and mandatory regulations concerning environmental performance are items which corporations desperately want to avoid and therefore improve performance internally without government interference (Khanna and Anton 2002). Because the potential costs of environmental risks, industry has evolved to develop environmental management systems that move above and beyond focusing only on minimum regulatory compliance (Khanna and Anton 2002). These corporate management systems are complex and vary within industries but govern themselves and often set benchmarks higher than minimum government requirements. Firms move beyond what is required by regulation by reducing the use of potentially hazardous materials in

processes, providing suppliers and customers with improved information, and tracking hazardous materials, which leads to product stewardship and increased environmental performance. Supply chains designed with environmental performance and product stewardship in mind also reduce liability to firms (Snir 2001).

Although the issue of liability is discussed in research on environmental health and safety management, little has been written about the active role of insurance companies in helping firms reduce environmental liabilities in manufacturing companies. Yet, it is likely that in their role as private governance institutions (Rudder et al. 2016), insurance companies do have some impact on this performance and it is important to "... recognize private governance, to understand it in its multiple forms, and to make the case that excluding it from the field of public policy diminishes both the understanding of the full policymaking universe and the proper reach of democratic aspirations" (25).

Research has been done on other environmentally focused private governance institutions that provide external guidelines on environmental management in manufacturing that go beyond regulatory standards. Two dominant institutions in this vein are The International Standard Organization (ISO) and Occupational Health and Safety Management Certification (OHSAS). Both of these organizations offer certification for firms that meet certain performance requirements. Research has shown that companies with ISO 14001 certification experience a significant positive improvement to recycling performance (Babakri 2004). Companies with ISO 9001, ISO 14001, and OHSAS 18001 certifications have significantly better environmental health and safety performance than those that do not, and even those that have a combination of the three but not all three (Wiengarten et al. 2017).

Some research has also explored the role of insurance industry as a private governance institutions that help firms reduce climate-related flood risk, particularly in Europe. In 2013, the European Commission reflected concerns about rising flood risks and how these risks can be accommodated with flood insurance. The idea was that insurance companies could act as private governance institutions and improve environmental performance without government intervention. Purchasing insurance as a risk transfer was found to influence the behavior of those insured. The influence can lead to either risk reduction efforts or in a moral hazard context where insurance can cause more risky behavior (Surminski 2014).

Thus, the research on the role of insurance industry in firms' environmental health and safety risk reduction is primarily limited to environmental disaster related insurance. While not mentioned as much in the literature, it is likely that insurance companies play a role in environmental health and safety risk reduction through other types of insurance. The ways in which insurance companies act as private governance institutions with respect to environmental performance at the facility level, however, are not well understood. Focusing on the printing industry, this thesis aims to better understand the role insurance companies play in helping firms manage their environmental health and safety (EH&S) performance.

In this thesis I will first review the existing literature on tools used by insurance agents in the prevention of environmental, health and safety incidents at manufacturing facilities. I will then outline the methods used to collect information and data from employees in the insurance and printing industries. Next, I will present the results of the study and present the findings. The thesis will then end with conclusions from finding analysis and policy recommendation.

Chapter 2 Literature Review

The goal of this literature review was to gain an understanding of the existing literature about manufacturers' environmental insurance in the United States. Literature from a variety of published journals was compiled using the Rochester Institute of Technology Library Portal and Google Scholar. The keywords "environmental insurance", "environmental risk insurance", "environmental and safety insurance", and "safety risk insurance" were used in the search engines. Articles were kept for review if they analyzed the tools insurance companies use in industry related to environmental and/or health and safety performance in the workplace. Articles were excluded if they focused only outside of the United States, discussed insurance in service industry, corporations, or hybrid businesses (rather than manufacturing), or if they focused on natural disasters and events, realty, or collateral insurance. The exclusion of international and non-manufacturing industries meant that the literature review would best match the study's goal of reviewing the prevention of environmental loss and damage with respect to printing firms in the United States. There was a large amount of literature on disaster-related insurance in the United States. Realty insurance regarding environmental risks was disaster or climate related was excluded from the literature review because this study aims to understand the role of insurance agents in preventing environmental health and safety risks at the manufacturing facility level. All in all, a total of fourteen articles were analyzed in this literature review. Most of the articles used in this literature review were found in the *Environmental Claims Journal* with all other articles being from similar topic journals revolving around risk and insurance (i.e. Risk Analysis).

The articles were placed into two categories, based on which mechanisms insurance agents used to reduce risk were discussed. These mechanisms could be placed into one of two broad categories: liability insurance and environmental loss and damage insurance. These broad categories are explained below in sections 2.1 and 2.2 of this thesis. Table 1 lists the papers reviewed, and the type of mechanisms that were focused on.

Table 1 Matrix: *A categorization of articles reviewed based on the types of insurance products companies use to reduce risk.*

Article	Types of Insurance	Year Published
Laffont 1995	Environmental Loss and Damage Insurance	1995
Freeman and Kunreuther 1997	Environmental Loss and Damage Insurance	1997
Richardson 2002	Environmental Loss and Damage Insurance, Liability insurance	2002
Kunreuther et al. 2002	Environmental Loss and Damage Insurance	2002
Tollin 2004	Liability Insurance	2004
Howard 2006	Liability Insurance	2006
Siesko and Weiss 2008	Environmental Loss and Damage Insurance, Liability Insurance	2008
Balmer and Hendry 2009	Environmental Loss and Damage Insurance, Liability Insurance	2009
Yin et al. 2011	Environmental Loss and Damage Insurance	2011
Shin et al. 2011	Liability Insurance	2011
Yin et al. 2012	Environmental Loss and Damage Insurance	2012
Huenke 2013	Liability Insurance	2013
Urgo 2014	Environmental Loss and Damage Insurance, Liability insurance	2014
Yang et al. 2017	Liability Insurance	2017

2.1 Liability Insurance

The first mechanism discussed in the literature is liability insurance, which involves the transfer of risk between the client and the insurer. In a review of safety and environmental pollution liability insurance (SELPI), Yang et. al (2017) states that liability is a significant burden for companies and clarifies how important it is to consider safety and environmental risks simultaneously because companies purchase both for a broader protection scope. Despite formal documentation and exemption terms for liability being discussed at time of coverage purchase, Huenke (2013) concluded in his research that insurance agents have a duty to analyze and comprehend a client's potential risks and exposures along with their budget concerns and provide the best coverage possible. This duty falls upon the insurance agency because there is a great potential economic loss to the agency if the company does have measures in place to prevent environmental, health and safety risks. As a result, safety and environmental liability insurance provides not only financial protection to a company, but often also includes risk assessment and prevention services.

2.2 Environmental Loss and Damage Insurance

The second mechanism used by insurance companies is environmental loss and damage insurance, which is used by insurance companies to prevent and reduce environmental risk. Yin et al. (2011, 2012) found in two separate studies that unlike state funded programs to reduce risk, insurance policies were uniquely structured to encourage risk reduction efforts in industry policy holders. One study, for example, focused on underground storage tank leaks and emphasized that a single tank leak, no matter how small, can mean a premium upsurge of 10-20 percent (Yin et. al 2012). Thus, companies in industry using storage tanks are incentivized to take as many precautions as possible to prevent environmental loss. Similarly, an article focusing on private

chemical firms by Kunreuther et al. (2002) found that losses from chemical accidents were greatly reduced due to third-party inspections combined with insurance contracts. This topic was reviewed again by Yin et al. (2011) who determined that insurance policies are explicitly structured to encourage industry to partake in risk-reduction efforts.

2.3 Tools Used by Insurance Agents

From a general risk prevention standpoint, insurance is primarily used to spread the economic consequences from an event to multiple parties and reduce the potential environmental, health and safety effects from these events (Richardson 2002). Beyond using the insurance types discussed previously, insurance companies also a number of more direct tools that influence client's behavior. I separated these tools into tool categories: liability, monetary, and business relations. Liability is the transfer of risk between the insurance company and the manufacturing firm. Monetary refers to the premium and premium pricing of various coverage levels and business relations is the contractual relationship between the firm and the insurance company. As you can see in Table 2, the most dominant type of tool discussed was liability, followed closely by monetary. The least discussed tool type was business relations.

Table 2: *The category of tools mentioned by articles reviewed.*

Article	Type of Tools Used
Freeman and Kunreuther 1997	Liability, Monetary
Richardson 2002	Liability
Kunreuther 2002	Monetary, Business Relations
Tollin 2004	Liability
Howard 2006	Liability
Yin et al. 2011	Monetary
Shin et al. 2011	Monetary, Liability
Yin et al. 2012	Monetary
Huenke 2013	Business Relations
Yang et al. 2017	Liability

Six of the articles talked about the transfer of liability between industries and insurance companies as a tool used by insurance agents. Based on performance of the company an insurance provider can choose to make alterations to coverage. This performance is evaluated by insurance providers using items such as audits and inspections. Having environmental liability insurance is required by the government to ensure that should environmental, health and safety loss occur, there is a responsible party. When losses and damages occur and the insurance company declines to pay out and argues that it is not liable, the client will often take the insurance company to court (Howard 2006). Unless otherwise specified in an insurance policy contract, liability usually falls to the firm. However, if the insurance does have this specification of liability responsibility in the provided coverage, then the insurance agency is liable for the compensation of environmental, health and safety accidents (Yang et. al 2017).

As you can see in Table 2, most of the articles focused on the liability tool type. Through the literature, liability as a tool was found to be the transfer of risk between the firm and the insurance company. It consists of three individual parts that specifically define the consequences of the liability tool. This transfer of liability transfers or mitigates the burden of risk from

environmental health and safety violations. In the cases where the firm has a violation, if it falls under coverage, the insurance company will take on the risk. Therefore, the burden of monitoring and managing risks is shared between the firm and the insurance company rather than falling immediately on the government for remediation. It is also shown that a wider degree of liability coverage by insurance providers leads to less workplace accidents.

Table 3: *The consequences of the liability tool type by article.*

Article	Transfers/mitigates the burden of risk from environmental, health and safety violations	Shares burden placed on government for the monitoring and management of risks	A wider degree of liability coverage leads to less workplace accidents
Freeman and Kunreuther 1997	✓		
Richardson 2002	✓	✓	
Tollin 2004	✓	✓	
Howard 2006	✓		
Shin et al. 2011			✓
Yang et al. 2017	✓	✓	

Another mechanism discussed by five articles is insurance premiums that are charged for both liability and environmental loss and damage insurance. As seen in Table 4, there were two main uses for this type of mechanism. The first was the risk-based pricing of insurance that leads to higher environmental health and safety performance. The second was that insurance companies used science and engineering studies to determine coverage premiums. From a health and safety liability standpoint, Shin et. al (2011) showed that employers will take more measures

to reduce the occurrence of occupational injuries and diseases in order to pay lower insurance premiums. Freeman and Kunreuther (1997) show that beyond liability, the premium reductions on insurance that can be given by insurance agencies to reward cost-effective risk measures have heavy influence. There are challenges to quantifying risks such as failure to report an incident. However, insurance agencies can provide a good performance premium that dwarfs the desire to ignore environmental, health and safety risk. Freeman and Kunreuther's (1997) research places emphasis on the unique trait insurance agencies have: they reward industries for investing in loss reduction and prevention measures through monetary tools.

Table 4 Matrix: *An explanation of the uses of the monetary tool type by article.*

Article	Risk-based pricing of insurance leads to higher environmental health and safety performance	Using science and engineering studies to determine insurance premiums
Freeman and Kunreuther 1997		✓
Kunreuther 2002	✓	✓
Shin et al. 2011	✓	
Yin et al. 2011	✓	
Yin et al. 2012	✓	

Lastly, only two of the papers focused on business relations as a tool. In this categorization of tools, business relations is defined as the contractual relationship between the

firm and the insurance company. Table 5 shows the two parts to the explanation of what is involved in the business relationship between the firm and the insurance company. First, the insurance company must comprehend all of the clients' potential risks and exposures. Second, the inspections by insurance companies can determine low and high risks. In a review of chemical firms, Kunreuther et. al (2002) found that the primary advantage of an insurance industry or a third-party inspecting is that there is a contractual relationship between the firm and the auditing party. This business relationship means that the inspection is viewed as an assisting procedure rather than from an enforcement stance. Smaller chemical firms have low incentive to follow regulatory procedures because they often believe their chance of being inspected by a government regulatory agency to be low. Forcing these smaller companies to purchase insurance means that they will have to comply with the third-party inspections and perform well (Kunreuther et. al 2002).

Table 5 Matrix: *An explanation of the business relations tool type by article.*

Article	Insurance company must comprehend all of the clients' potential risks and exposures	Inspections by insurance companies can determine low and high risks
Kunreuther 2002	✓	
Huenke 2013		✓

2.4 Literature Review Conclusion

From the literature review, I developed three category types of tools used by insurance companies: liability, monetary, and business relations. Liability and monetary tools were the most common tools types discussed. Only two of the articles were related to business relations. The tools are used by insurance companies to prevent environmental loss and damage. In preventing environmental loss and damage, the insurance companies could be improving the environmental performance of firms. Because of this, there could be a possible influence of insurance companies on the environmental performance of firms.

The small amount of literature on the role of insurance companies in firm environmental performance points to a need for further research into this topic. The literature was primarily from the *Environmental Claims Journal*, which is a journal focused on research regarding environmental litigation in the courts of the United States. This study aimed to define the role insurance companies play in helping manufacturing facilities reduce environmental health and safety risk in order to enhance the understanding of the overall system of environmental performance in manufacturing. The insurance companies providing environmental loss and damage coverage, previously shown to be private governance agencies, do not have significant regulations placed upon them due to their work outside of public view. Thus, this study also sought to determine if insurance companies possibly act as effective private governance institutions.

Chapter 3 Method

For this research, I used a mixed methods approach for collecting data. In order to understand of the role that insurance plays in environmental performance, I needed to look at both the insurance industry and the industry that was being insured. The first method used to collect information from the insurance and printing industries was a set of semi-structured in-depth interviews. A qualitative survey was then crafted from the analysis of the interviews to question persons of the printing industry.

This interview method chosen for the insurance industry required a relatively small sample size (less than 25 subjects) to give the entire qualitative data set a heavy analysis. A qualitative data set can create a rich description of the role that environmental insurance agents play in the prevention of environmental loss and damage. It is the interviewer who is exploring the real-life experiences of the interviewees and assess their perspective (Qu 2011).

Understanding what insurance company employees themselves think they play in the prevention process is vital to maintaining this study's validity. The printing industry is an appropriate industry to study because it includes a multitude of possible environmental losses and damages that are of great interest to the government of the United States to prevent (i.e. ink spills, wastewater discharge, air pollution).

3.1 Interview Method

Unstructured in-depth interviewing is commonly used in “research where respondents’ experience is analyzed with the uncovering of its thematic dimensions in view” (Crouch 2006 488). As there are multiple roles that these insurance agents play, it is important to keep the interview open-ended and allow for the interviewer to keep the interviewee on topic and ask questions only when necessary. Having such exploratory interviews also allows for each interview to be conducted on a case-by-case basis and be placed into the created categories separately. Just because the individuals have similar backgrounds does not mean that they have the same experience, and it is important for all participating to be able to articulate they believe the role of insurance companies in environmental performance of manufacturing is.

A categorization of tool types used by insurance companies in the prevention of environmental, health and safety losses was created through a literature review (Table 2). These categories were then defined (Tables 3-5). The knowledge of the types of insurance and tools though to be used by insurance companies was then used to craft the interview guide. Keywords such as “premiums”, “responsible party”, and “inspections” gave the investigator a clue to dig deeper into the specific subject being discussed.

As with any in-depth interview study, there was a risk that the data collected would not be categorizable. This was avoided through careful crafting of topic questions in the interview guide, as seen in Appendix A. Questions were refined as interviews were completed and more information was understood.

3.1.2 Interview Sample

There are over five large physical printing facilities in the Rochester area with printing also being at the heart of the city's industrial history. Insurance agents and employees in the printing industry were interviewed because they have experience in what were deemed possible environmental losses and damages to printing businesses (based on comparisons that are made in literature review). The reason for this focus is twofold: connections through thesis advisors and locality to the university this thesis was being completed for. As a potential benefit to those interviewed, the population interviewed learned more about the role of insurance industry as a potential resource for managing risk. Printing employees would have seen the development of the printing industry in Rochester, as well as changes to the role they may have played in preventing these environmental losses in damages.

3.1.3 Interview Data Collection

For this thesis, interviews (in-person or by phone) were conducted to define the role that insurance agents play in preventing environmental loss and damages to businesses. Interviews with 10 subjects were conducted in the United States in person or through a phone call. These exploratory interviews were completed with subjects to better understand and gain insight into insurance in industry and to have appropriate sample size for in-depth interviews. The number of interviews was determined both by the availability of industry and insurance employees, as well as the time limitations of the researcher. These interviews were between 20 and 30 minutes long. Interviews were each recorded and transcribed for analysis, which involved coding the text to find the categorized types of tools used by insurance agents to enhance environmental performance. A similar data collection method was used in a journal by Johannsdottir (2014),

who looked at Geneva Association framework for climate change through the eyes of Nordic non-life insurers.

Data collected from the human subjects was kept confidential, but not anonymous. All information was stored in a password protected folder on a non-public computer and was made available only to persons conducting the study. Physical interview notes were transferred into electronic format in this folder and the physical versions were then destroyed. Unless explicit permission was given to the persons conducting the study, information was reported in a way that does not identify any subject. All information collected was only be accessible by the primary researcher and the investigator. To ensure no possible coercion, all interviews were completely voluntarily. Any subject was able to withdraw from participation at any time before data collection was completed and have their data destroyed or returned to them. Participants were given a copy of the thesis if requested. It was the goal of this study to create a source of information beneficial to both firms and insurance companies. This information was all be provided to each subject prior to the interview in a physical form which they will have to sign for consent. A copy of the signed form was given to the subject interviewed.

Using transcriptions of the recorded interviews, categories were defined and explained through a coding agenda. The qualitative coding and categorization were completed following a method outlined by Yin (2011). The method consists of creating a set of initial codes, defined as Level 1 or initial codes, which remain close to the original items and service as a starting point for determining if the open codes relate to each other. From here, a second higher set of codes is referred to as Level 2 or category codes. This second set creates the categories found from interview analysis. The categorization provides definition and proof of existence to the role that insurance plays not only in environmental performance, but also in health and safety. The

existence of this role enhances the tool usage defined in the literature and proves that insurance companies have a variety of means to go about their role with firms' performance. The entire coding agenda used in this study can be found in Appendix A.

From the category coding, three major category areas pertaining to the role of insurance in a firm's environmental health and safety performance were found. These categories are: insurance companies as a resource, business relations, and improvements to environmental health and safety performance. The three categories will be discussed in the following analysis subsections.

3.2 Survey Method

After performing the interviews outlined in section 3.1, a survey created using Qualtrics was sent out to two different printing associations. The first survey sent out was sectioned into background information, opinions, and then the assistance and business relationship that is between the insurance and printing companies. This survey consisted of 48 questions in the form of multiple choice, short text answer, and matrix questions. This survey took about 20 minutes to complete when tested and was sent out in a Printing Industries of America (PIA) newsletter and was kept open for two weeks. 15 total responses were received, eight of which were usable. Concerned about the low response rate of the first survey round, the researchers shortened the second survey to 31 questions, which took respondents about 10 minutes to complete. This second survey was sent out to members of NAPCO Media (North American Publishing Company). An incentive of a voluntary gift card raffle was also added onto the survey. These changes were made to entice more responses to the survey in this second group. 12 total responses were received, nine of which were usable. It is important to note in the second survey,

31 questions kept were exactly the same as from the first survey. Because of this, the first and second survey could be combined for analysis.

The two printing associations that worked with the researchers to contribute to this study are PIA and NAPCO Media. Both organizations had members across the United States in various sectors of the printing industry. This wide reach of members gave the survey a much higher response rate and broader audience.

3.2.1 Survey Questions

The interviews gave insight into the insurance companies' viewpoint on the role that they play in the prevention of environmental health and safety events. The survey's questions were crafted from the information and background understanding these interviews gave the researchers. The questions were therefore broken into background information, the printing companies' opinions, and the business relationship in order to get the viewpoint of the printing companies on the role that the insurance companies play. Therefore, the survey sought to understand the viewpoint of the printing companies being insured and was requested to be filled out by the person in the printing company that regularly interacts with insurance.

The background information portion of the survey was designed to determine characteristics about the respondents that pertained only to the area of environmental health and safety being questioned. A standard scale from "Extremely likely" to "Extremely unlikely" was used to determine how likely printing firms were to go to suppliers, government regulators, industry associations, other printers in their professional network, and insurance providers. After this, a standard scale of "Strongly agree" to "Strongly disagree" was used for the opinion and business relationship questions. Survey questions used in this analysis are found in Appendix C.

Chapter 4 Analysis

4.1 Interview Analysis

A total of ten interviews with individuals based in the United States were performed for this study. Six interviews were focused on the insurance industry and consisted of: two loss control consultants, two loss control directors, one underwriter, one technical manager. All of the individuals interviewed were approached through different channels, such as personal contact, industry organization or association, or recommendation from another interviewee. All interviews were split into two groups: those that are employed by insurance companies that interact directly with clients and those that did not. For the former, coding was used. Table 6 shows the coded interviews with insurance agents, along with an explanation of the role of each interviewee. Other interviews provided background information on the industry and helped develop survey questions specific to the printing industry. Table 7 defines the role of all other interviewed and whether the interview was used for background information or survey development.

Table 6: *Coded interviews with individuals employed by the insurance companies and their defined roles.*

Interview Date	Title	Role	Formal Coding
2/1/2019	Loss control consultant	Conducts loss control field inspections and generates loss control reports	Insurance Companies as a Resource
3/4/2019	Loss control consultant	Conducts loss control field inspections and consults with customers regarding solutions towards risk prevention	Insurance Companies as a Resource, Business Relations, Improving Environmental Health and Safety Performance
3/22/2019	Loss control director	Leads consulting and responds to client inquiry regarding coverage	Insurance Companies as a Resource
3/25/2019	Loss control director	Leads consulting and field inspections with customers	Insurance Companies as a Resource, Business Relations, Improving Environmental Health and Safety Performance
4/8/2019	Technical manager	Point of reference for all insurance staff and interacts with client to ensure coverage requirements are met	Insurance Companies as a Resource, Business Relations, Improving Environmental Health and Safety Performance

Table 7: *Other interviews completed with the defined roles and contributions to the study.*

Interview Date	Title	Role	Background Information	Survey Development
2/21/2019	COO	Oversees all commercial manufacturing		✓
3/6/2019	Underwriter	Uses data collected by insurance consultants to decide whether or not to provide coverage and with what requirements	✓	
3/13/2019	VP of Human Resources	Oversees risk and compliance side of HR and interacts with company's insurance provider		✓
3/27/2019	EH&S Specialist and Environmental Manager	Analyzes data to determine if insurance clients are meeting their coverage requirements	✓	
3/29/2019	Insurance Broker	Represents firms in search for insurance coverage	✓	

4.1.1 Insurance Industry Background

The interview sample demonstrated a high level of complexity in the actors involved in the insurance industry's manufacturing coverage sector. These actors were present in all insurance companies interviewed (Table 6). The insurance employee most directly involved in the interaction between the insurance company and its client is the loss control consultant. Loss control consultants determine through facility inspections potential environmental health and safety risks and remove or reduce those risks. Loss control directors oversee a group of loss control consultants and are involved with inspections themselves. The technical manager interviewed explained that their position was the same as that of a loss control director at other insurance companies.

There were two other interviews with actors on the insurance industry side of the business relationship. One interview was with an underwriter. The underwriter interviewed gave the study great insight into their role of evaluation of potential risks found by loss control consultants. An underwriter evaluates risks of potential clients and translates the total perceived amount of risk into the offered coverage.

While an underwriter is responsible for drafting the coverage contract between the provider and the client, some insurance companies have so many clients they outsource the continuous monitoring of coverage to make sure that clients are meeting coverage requirements. The other interview was with an environmental health and safety specialist and environmental manager from a company that specializes in creating insurance software for analyzing risk data to determine if an insurance company's clients are meeting their coverage requirements.

Though the actors involved in insurance coverage were similar across insurance companies, there was variation in the insurance industry with how each company handled

business. The focus of the insurance companies ranged from loss control as a sale goal to a service to clients. One loss control consultant recalled a time working for an insurance company that made a business decision to require loss control consultants to meet a certain sale goal quota. This sale goal quota revolved around selling loss control services to various firms in manufacturing. This person decided to leave that company to work for another insurance company without the sale quota.

We had to actually sell our services to people who weren't insured with us, so they wanted us to do cold calling and that kind of stuff.

[Loss control consultant, 2/1/2019]

They felt that when an insurance company views loss control as a service to clients, rather than a sales goal, there appears to be an improvement to business performance of insurance companies. Another interviewee felt that their small insurance company was performing as well as larger companies in the insurance market because of the level of expertise their insurance agents must have in order to sell insurance.

We're as big and competitive as many other groups, and that's because we absolutely require a significant level of expertise in our space for anybody who is gonna have access to sell our product. So that's something kind of unique about us, and why you would hear me say customization so frequently, it's specifically because of the way we've structured our business.

[Loss control consultant, 3/25/2019]

Firms take notice of this variation in business approach and larger firms may employ an insurance broker to represent them in negotiating insurance coverage to receive the greatest amount of coverage at the lowest cost. Insurance brokers act as important business middlemen between the two industries. They deal with high level people in firms, such as a CFO, and because of this often have a high success rate in finding the best coverage plan for firms.

When we are in a meeting, we do deal people high level. We are trying to meet with a CFO because we then have a very high success rate.

[Insurance broker, 3/29/2019]

4.1.2 Insurance Companies as a Resource

All interviewees made a point that their companies are more than willing to provide assistance and guidance to the firms they provide coverage for. Insurance companies have a financial interest in actively helping firms reduce and prevent risk and, therefore, their premiums. An avoided risk that is under coverage translates to the insurance company avoiding a payout. The vested interest in risk prevention makes the insurance companies more willing to spend their resources in order to determine the causes of risk that do happen and to prevent further events.

We have a lot of guidelines or best practices and alerts that we provide to companies.

[Loss control director, 3/22/2019]

Therefore, firms should look to insurance companies for advice in risk prevention and solution. Firms can follow the guidelines provided by insurance companies and use the insurance company as an information source to prevent risk. Some examples of firms avoiding risks because they use insurance companies as a resource are:

I would analyze the sprinkler systems and the fire safety codes to make sure that they were properly protected. I would train people on how to do accident investigations, what we call an incident investigation.

[Loss control consultant, 2/1/2019]

For us, a consultation is really a focused visit on a specific series of problems or concerns that a customer has and that they want us to address on their behalf. And the remainder of our interactions are trainings.

[Loss control director, 3/25/2019]

[A company] didn't have 'return to work' policy so that people were out full time. So I worked with them to kind of put all those processes in place and reduce the overall claim cost.

[Technical manager, 4/8/2019]

Even though insurance companies may be resources available to customers, firms vary in how they view insurance company as a resource. Firms that seek insurance companies' advice about potential environmental health and safety issues will have access to a plethora of readily-

available assistance to help meet their environmental health and safety goals. Some insurance companies go so far as to outsource consultation for their clients who request this help if the insurance companies do not already have a fulltime employee to do so. These examples of avoided risks were only possible because of firms viewing and seeking insurance companies as a resource.

You can send me to your best facility with your best facility manager, where everything is absolutely the best. And I'm gonna walk away and that's gonna create a report based on that snapshot in time. ... Or you can let me in, and you can show me where the cracks are, and then I help you with those.

[Loss control consultant, 3/4/2019]

4.1.3 The Importance of Business Relationships

As insurance companies are shown to be a resource to firms seeking to perform well in environmental health and safety, there is a question as to how they go about doing so. A moral hazard can arise among companies who have insurance for environmental health and safety events. While a moral hazard is not common, it is something that immediately deters insurance companies from considering providing coverage.

I've had companies say to me, "Well that's why I have insurance, right?" That's not someone who we would necessarily say is a great risk.

[Technical manager, 4/8/2019]

Because of the issue of moral hazard, insurance companies are on the look-out for companies that are seeking profits over risk prevention. As a first step, they may work with the company to help them see things differently. As one loss control director explained:

We call out that moral hazard that a lot of times companies make a decision based on financial implications. That's not always in the best interest of the environment or their associates, and we aim to put a stop to it.

[Loss control director, 3/25/2019]

In addition, insurance companies may increase premiums for these firms, or even decline to provide coverage.

If someone says to me something like, “That's what I have insurance for,” then I'm immediately like, “You're gonna have to get it from somebody else.”

[Loss control consultant, 3/4/2019]

We have zero fear of anyone looking at us and saying, “Well, we're not gonna buy insurance from them because they're saying things contrary to my profit beliefs.”

[Loss control director, 3/25/2019]

On the other hand, a more proactive approach by firms to reduce and prevent risk is appreciated by insurance companies. These firms are offered lower premiums because they are low risk and therefore have reduced liability for insurance companies to cover. Premiums for coverage are one of the tools used by insurance companies to compete in the insurance market for firms.

We prefer companies that work with insurance, take it seriously, and want to avoid losses, not rely on insurance after a loss. We want proactive.

[Technical manager, 4/8/2019]

To become an acceptable risk for an insurance company, firms must also be transparent to insurance companies regardless of how they are performing. This can be stressful for firm employees. Insurance agents in the field are aware of this and will attempt to make information gathering as fluid as possible for the firm.

I come in, I ask a lot of questions, I need to see a lot of stuff. I'm looking for proof, I'm trying to verify. It's hard to fool me, so it can be stressful for people.

[Loss control consultant, 3/4/2019]

4.1.4 Improving Environmental Health and Safety Performance

An improvement to environmental health and safety performance results in risk prevention and loss reduction. To facilitate firms making improvements to their environmental health and safety systems, insurance companies can set requirements for coverage more than the bare minimum required by government regulations.

We're really pushing all of our clients to be a better risk, and to be a better risk is usually beyond compliance.

[Technical manager, 4/8/2019]

Some of our essential recommendations are not regulatory, but just a best practice that we want to see in place to reduce losses.

[Loss control consultant, 3/4/2019]

In some cases, our [performance requirements] are different by what's required [by law], for sure, because we have a higher set of standards.

[Loss control director, 3/25/2019]

During the improvement process, insurance agents are often able to help customers avoid risk. One interviewee provided an example of potential future improvements that aim to prevent loss from occurring and impacting a firm.

Great example is that you'll see over the course of the next few years [is] as the growth of the industrial hemp market continues to explode, the chemicals that we have out there today are not necessarily designed to cooperate with the hemp plant. So as a result, we're working with several manufacturers to ensure that products get properly labeled before they get distributed so we can avoid significant losses that would come from a poorly labeled product.

[Loss control director, 3/25/2019]

The goals made by firms to prevent and reduce environmental health and safety events are supported by insurance companies and often met because of improvement. This support is done by reviewing of a firm's current practices and making suggestions accordingly.

Do they have preemployment physicals? Do they have written safety plans? What type of trainings do they do already?

[Technical manager, 4/8/2019]

So we'll help people develop programs, implement programs, train people... Insurance companies don't like to make themselves liable for things. But if we feel like we can, we might do industrial hygiene testing, for example, or something like that, and work with them to improve.

[Loss control consultant, 3/4/2019]

Continuous improvement by firms in environmental health and safety performance is noted by insurance companies. Following an insurance company's suggestions is noticed and

regularly monitored by insurance companies and changes to premiums and coverage requirements can occur that benefit firms. These incentives make firms want to demonstrate improvements in order to showcase themselves as good risks.

Let us help you improve your situation. You will result in less losses. There's gonna be less losses paid. You're gonna be a more attractive risk, it's gonna lower your premiums...

[Loss control consultant, 3/4/2019]

4.1.5 Interview Summary

There is variation in the insurance industry among how companies handle their business. Despite these variations, insurance companies claim that they actively help firms reduce environmental health and safety risks. They do so by engaging in business relations with firms that avoid moral hazard and short term profit-driven mentality. Firms that engage in risk prevention and are transparent with their data are given preference in the insurance market and have lower coverage premiums and relaxed coverage requirements. Insurance companies are willing to act as a resource for firms that wish to improve their environmental health and safety performance to prevent risk. This means that firms' performance goals can be supported and met because of insurance companies acting as an environmental health and safety resource. These interviews suggest that insurance companies have an authoritative nature that affects a broader public with a potentially positive substantial impact on environmental health and safety performance. Therefore, insurance companies meet the criteria of being a private governance institution.

4.2 Survey Analysis

The surveys sent out had a combined total of 27 responses. Of these, 18 of the responses completed at least 19% of the survey. For this reason, only these 18 responses were included in analysis. Because the survey was completely voluntary, some of the 18 respondents did not answer certain questions in the survey. Questions that were not completed by these respondents were excluded from the data set. The first survey's data set was filtered to only the questions present in the second, smaller survey. In this way, both surveys could be analyzed together. Therefore, the remainder of this analysis will refer to both surveys as one.

of the printing firms that completed the survey had a total number of employees of less than 50, with two firms having 50-100, eight having 100-500, and one having over 500 employees. The average number of full-time and part-time employees involved in environmental health and safety were 3 and 1 respectively. However, five respondents only had one full-time employee involved in environmental health and safety. The fulltime average was high because of an outlier company with 100-500 employees that had 10 fulltime employees involved in environmental health and safety. The part-time average was one rather than zero because of another outlier company that had five part-time employees involved in environmental health and safety. The designated person that interacts with the insurance company on behalf of the printing firm tended to be the CFO of the firm. Most of the firms surveyed had Forestry Stewardship Council (FSC) or Sustainable Forestry Initiative (SFI) certification on some of their paper products or purchased printing materials.

After background information for the responding printing firms was asked, the next sections of the survey focused on where firms were likely to get information on environmental health and safety liability, as seen in Table 8. Nine out of 14 companies were extremely likely to

get information on possible incoming environment, health and safety liability items from suppliers and nine out of 14 from industry associations. Six of the printing firms were somewhat likely to seek the same type of information from government regulators and seven from other printing firms in their professional networks. Six respondents were neutral on whether or not they would seek this information from their insurance carrier. Four respondents somewhat agreed that their insurance provider was a source for information and three strongly agreed.

Table 8: *Number of selected responses per source for how likely printing companies are to seek information from select sources.*

How likely are you to go to the following sources to get information on possible incoming EH&S liability items?	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Suppliers	9	5	0	0	0
Government regulations	1	6	2	3	2
Industry associations	7	3	3	1	0
Other printers in my professional network	3	7	1	2	1
Insurance provider	3	4	6	1	0

As seen in Table 9, two out of five printing companies neither agreed nor disagreed that their health and safety insurance company was a resource for information and provided useful advice. When asked if their insurance provider kept them well informed of current and new regulatory requirements, printing firms were split between somewhat agreeing (three) and disagreeing (two). Two printing firms neither agreed nor disagreed that their insurance provider helped their facilities improve environmental health and safety performance. One printing firm somewhat agreed, one somewhat disagreed, and one strongly disagreed that their insurance provider has assisted them in improving environmental health and safety performance.

Table 9: Number of selected responses per source that scaled opinion of printing firms towards their health and safety insurance provider.

In your relationship with your health and safety insurance provider:	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Contact insurance for advice on potential liability issues	1	1	2	0	1
Use advice given by insurance provider	1	1	3	0	0
Views insurance provider as a resource	1	1	2	1	0
Insurance sets higher standards than regulation	0	2	3	0	0
Insurance informs firm of current and new government regulatory requirements	0	3	0	2	0
Satisfied with overall business relationship with insurance provider	0	2	3	0	0
Insurance provider has helped firm's facility improve its EH&S performance	0	1	2	1	1

The firms were also asked if they had any environmental insurance and what their opinion was towards that provider if it was different than their health and safety insurance provider. All but one printing company did not have environmental insurance and this company had less than 50 employees. There was one company that had a different insurance carrier for environmental and health and safety insurance. The responses of this company's opinion towards its environmental insurance provider was the same as towards its health and safety insurance provider. The respondent strongly disagreed that the insurance provider for environmental insurance did not contribute towards environmental health and safety performance or provide advice or resources regarding potential liability issues and general environmental health and safety information.

As seen in Table 10, three printing firms out of five somewhat agreed that their insurance coverage could be the best available to them. Three firms also somewhat agreed that they felt comfortable in sharing information with insurance companies and being transparent with issues.

Four printing firms neither agreed nor disagreed that facility visits by insurance agents were a nuisance.

Table 10: *Number of selected responses per source that asked about business trust that printing firms have with their insurance providers.*

In your relationship with your health and safety insurance provider:	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I believe that me insurance provider will work with me to give me the best coverage possible.	0	3	2	0	0
I feel comfortable sharing information with my insurance provider.	1	3	1	0	0
I feel facility visits by my insurance carrier are a nuisance.	0	0	4	0	1

The final portion of the survey asked printing firms about the business relationship and direct assistance that insurance providers may provide, regardless of printing firms’ opinions or the type of insurance. As you can see in Table 11, this last set of questions revealed a high level of difference among printing firms with regards to the business relationship.

Table 11: *Number of selected responses per source that asked about business relationship and direct interactions that printing firms have had with their insurance provider.*

My insurance company has helped me:	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Mange my chemical inventory	0	0	2	2	4
Train my employees in workplace safety	3	0	0	0	4
Train my employees in environmental event prevention	1	0	3	0	4
Understand various types of EH&S insurance coverage	0	3	1	1	3
Access certified loss control professionals for advice	2	1	2	0	4
Review my safety systems (e.g. fire sprinkler)	2	0	4	0	3
With incident investigations	2	0	2	1	4
Review my product quality process	0	2	3	0	4
With my overall EH&S management systems	0	2	2	1	2

Four out of eight of the respondents strongly disagreed that their insurance company has helped them manage their chemical inventory, and none of the respondents said somewhat agree or strongly agree. Three respondents strongly agreed and four strongly disagreed that insurance providers helped them train their employees in workplace safety. Five of the respondents stated that the most common risk training program offered by the insurance providers to printing firms was “General Workplace Safety.” Three printing firms somewhat agreed that their insurance company has helped them understand various types of environmental health and safety insurance coverage. Three printing firms also strongly disagreed to this. Four out of nine printing firms strongly disagreed that the insurance companies gave them access to certified loss control professionals for advice or helped with incident investigations. Two printing firms somewhat agreed that their insurance providers helped them with their overall environmental health and safety management systems. Two neither agreed nor disagreed, one somewhat disagreed, and two strongly disagreed.

Chapter 5 Summary and Findings

5.1 Summary

This thesis aimed to define the role that insurance has in the environmental performance of printing firms. With both industries, the environmental and health and safety systems tended to branch over each other. The monetary, liability, and business relationship tools sorted in the literature review of this thesis were found to be just the bare-minimum understanding of the role insurance companies have. The data gathered from interviews suggests that from the insurance company's perspective, an insurance company's business strategy is to be a resource of information and consulting assistance to firms is intended to produce a positive impact on the environmental health and safety performance of firms and thus reduce losses for the firm and insurance company. This is the role which insurance companies play in the environmental health and safety performance of firms. If true, this would make insurance companies effective private governance institutions.

In comparison to the literature review, these interview findings demonstrate more depth in the role that insurance companies play. The tools found in the literature review help define the role of insurance companies, as suggested above. The liability tool is the transfer of risk between the client and the insurer. This transfer of risk occurs as part of the business relationship and transaction between insurance and manufacturing industries when a contract for coverage is made. Improvements to environmental health and safety performance of firms occur because of the monetary tool that insurance companies use as an incentive to perform well. As performance rises, the financial risk quantification and charge for coverage is lowered, therefore causing a

manufacturing company to strive for environmental health and safety improvements. The “business relations” tool type is suggested to be a much greater part of the role that insurance companies play than the literature suggests. Interview analysis shows that it is likely the method through which insurance companies are able to act as a resource and improve environmental health and safety. The business relationship part of the role rewards manufacturing firms engaging in risk prevention and suggests that insurance companies do not support moral hazard and profit-driven mentality in their clients.

However, the printing industry’s viewpoint on the same relationship, as defined by the survey, was different. Survey analysis shows that two out of four printing firms do not agree or disagree that insurance companies as a resource, and one out of four printing firms somewhat disagree that insurance companies are a resource. Two out of four printing firms do not agree not disagree that insurance companies have helped them improve their environmental health and safety performance. One somewhat disagreed and one strongly disagreed. These opinions likely indicate that printing firms do not see their insurance companies as an environmental health and safety resource. The insurance industry views themselves as proactive, helpful, and knowledgeable, all of which the printing industry’s definition appears to disagree with. This suggests that insurance companies can act as effective private governance institutions for printing firms’ environmental health and safety risks, but do not.

5.2 Discussion

The difference between the interview and survey results was unexpected. Given the enthusiasm expressed by the loss control consultants, we expected printing industry representatives to have a strong positive opinion towards their insurance provider, yet the survey showed there was great variation in opinion among the survey respondents and there are several

reasons to explain this finding. First, there may be variation in the offerings of the insurance companies of those in the survey population. Most companies in the printing industry are predominately small (Rothenberg and Becker 2004). It is possible that quality service as part of coverage is mostly offered to larger businesses in manufacturing. One printing association's director of environmental health and safety suggested that insurance companies may not invest as much into smaller printing companies in the insurance market in order to focus and prevent the greater risks at larger printing companies:

The larger [printers] probably have the greatest interaction cause they're the greatest potential for exposure. Very unique in terms of the potential losses that the insurance companies are willing to take.

[Printing Industry Association Expert 10/28/2018]

Second, there could be a lack of understanding between the two industries. It is possible that while they may trust each other in data transparency, the two parties involved do not have regular interactions outside of what is required in coverage such as facility visits. The insurance industry may have to remind their clients in the printing industry to come to them for advice on potential environmental health and safety risks.

Third, printing firms tend to seek environmental health and safety information from printing associations and suppliers the most. A study on the technical assistance programs and the diffusion of environmental technologies in the printing industry by Rothenberg and Becker (2004) found that small printing firms identify suppliers and other industry sources as more useful than the government in providing information for new environmental technologies. The small printing firms were also less familiar with government-sponsored programs for environmental technology and perceived some of these programs to be less useful. One possible reason that printing firms do not seek information from insurance companies could be similar to Rothenberg and Becker's (2004) found perception of government programs. Printing firms may

be unaware that insurance companies know environmental health and safety information and that this knowledge could be useful to small printing firms. They could also view their insurance companies more as a regulatory body similar to the government that could “punish” them for environmental health and safety events rather than help prevent more future events.

Another possible reason for printing firms to seek information from printing associations and suppliers is because they likely think these actors have more pertinent information to the printing industry than insurance companies do. Printing associations are known to assist members in understanding important information regarding performance. As mentioned before, research shows that firms take steps to improve environmental health and safety performance and survey analysis suggests that they seek information on how to do so through their printing associations. Suppliers service multiple printing companies, just as printing associations do. In survey analysis, nine out of 14 respondents strongly agreed that suppliers were a source of information for environmental health and safety liability. It is possible that suppliers are so large in comparison to the printing companies they serve that they spend the resources to determine the environmental health and safety risks of the goods they source to printing firms as part of a service.

This study proposes that insurance companies can act as private governance institutions, but that they are different than other private governance institutions such as ISO. The primary reason these two entities are different is because ISO is a voluntary certification whereas environmental health and safety insurance is coverage that is paid for. Both ISO certification and insurance coverage must be continuously be maintained. The process to be ISO certified is voluntary, not required by the United States’ government, but results in positive improvements to environmental health and safety performance (Weingarten et al. 2017). It is strongly suggested

and in some cases required that manufacturing companies have health and safety insurance. Environmental insurance is important if there are potentially relevant risks such as a chemical spill. Both environmental and health and safety insurance are not required by law in the United States aside from Worker's Compensation insurance. There are also state exceptions to this insurance requirement such as Texas (National Government 2017). It could be that because of the premium paid for coverage, smaller companies, such as the majority of the printing industry, may seek out the cheapest insurance coverage possible to meet government standards because their perceived risks are low and they wish to save money. Thus, they may not purchase environmental insurance or would buy cheaper insurance that is more transactional, rather than one in which insurance companies proactively help the firm meet its environmental goals. One possible explanation for this is that printing firms are concerned about reaching their environmental health and safety goals, but that insurance is viewed as a recommended requirement by the government that is not worth the payment premium to have. Another explanation is that it could be seen by printing firms as a solution to handling eventual losses and damages from unforeseen events that are so unlikely, it is not worth the coverage costs. Larger companies may have greater environmental health and safety risks and could view excellent insurance coverage as an investment in protecting profit.

Insurance companies can act as private governance institutions, but this study also shows that printing firms do not see these insurance providers as effective in this role. It is possible that a lack of readily provided information to printing companies leads these printing firms to view insurance companies as ineffective private governance institutions. Additionally, while there may be environmental health and safety performance improvements associated with insurance, the potential for moral hazard in some clients' behavior could be a detriment to performance.

Smaller printing firms may be inclined to purchase the minimum required insurance by law and not invest money in environmental health and safety improvements in order to make higher profit. These smaller printing firms and similar firms in other industries should be focused on by insurance companies. Small firms could best use the advice and assistance from insurance companies, rather than sacrificing time and money.

5.3 Limitations

There are a number of limitations to this study. First, there was a small response rate to the survey. Thus, while the survey revealed the variety of views on the role of insurers, the distribution may not reflect those of the larger population.

The second limitation is that the study focused on the printing industry. The industry is unique in its environmental health and safety profile and has a large number of small firms. For most small printers, environmental and health and safety insurance is not a large business consideration because those events that fall under the coverage do not occur often. This may also explain the low response rate, as small printers may not have seen the topic as relevant enough to spend time on the survey. Neither health and safety or environmental insurance is required by law in the United States for printing firms except for Worker's Compensation. Even then, not all 50 states require this insurance and there are multiple exemptions (National Government 2017).

Third, most printing firms stated that the person that interacts the most with insurance companies is the CFO. It is possible that the person who answered the survey could be someone other than the CFO, such as a member of an environmental health and safety department. This would mean that the data collected for that response would be reflective of that printing firm's environmental health and safety performance, but not of the person who has the most direct interaction with the firm's insurance carrier. On the other hand, this may not be a large concern

since we were most interested in how the environmental health and safety departments of printing firms viewed the insurance companies as resources.

Fourth, due to the low response rate, we combined results from the first and second surveys. In addition, if the second, shorter survey with an incentive was sent out to both printing associations, there may have been more respondents and therefore much more data to analyze.

To form the insurance industry's viewpoint, the interviewees were sampled from a connected group of individuals. This may mean that all interviewees share the same opinion: insurance companies are active and successful in assisting their clients. The interviewees from the insurance industry also have an incentive to define their role in environmental health and safety performance in this way. If the role of insurance was found to definitively be a positive correlation to performance, there could have been a number of printing companies seeking insurance coverage they do not already have. Further, other industries could have seen this study and made the inference that having environmental health and safety insurance could lead to performance improvements for them as well. Both of these points could cause an increase of clients in the insurance market.

5.4 Implications for Research

For a large market, insurance in relation to environmental health and safety performance is under-analyzed in academia. This area of research should be boosted by the exploration done by this study and the research done by others on corporations' internal environmental management systems. There is a clear lack of understanding as to the mechanisms behind the complex relationship between insurance companies and their clients.

To better understand and support how this specific relationship is handled, a series of similar interviews to those used in this thesis could be completed with a wider variety of firms,

perhaps with a focus on industries with more significant waste issues and that are comprised of larger firms

One of the major questions that could be investigated in future research if insurance companies are a resource to firms, why is this resource not being used by firms? The interviews performed in this study outlined a potential in some firms for a moral hazard. It could be that this moral hazard is a common occurrence and firms do not concern themselves in preventing losses because they have insurance to support them. However, the survey showed that printing companies do have certifications on their products that reflect higher levels of environmental health and safety performance.

There is also a need for research to see if there is a financial benefit for small businesses to rely on their insurance providers for EH&S assistance. If insurance providers are already spending resources to actively reduce risk in their clients, this is an area that small businesses clients could rely on help with and be less concerned about the rare potentially significant environmental health and safety risk. These services offered to small business could also be correlated to insurance business success. It could be that a higher level of service to clients directly correlates to less risk events and payouts occurring for the insurance companies.

5.5 Implications for Policy

Private governance institutions are institutions that regulate and control firms, although not through the rule of law. The analysis performed in this thesis shows that insurance companies believe that they have an impact on the environmental health and safety performance of their clients, thus suggesting that they are private-governance institutions. Given the survey response, however, it is not clear that all printing firms agree. There was a range of views on the extent to which insurance companies actually impacted firm practice and performance.

After more research and conversation with both insurance and printing industries, it may be beneficial to have some policy in effect to encourage insurance companies to offer more preventative services through incentives, such as tax reduction, to insurance companies who offer these services. This policy would need to be developed with large input from both industries and would aim to prevent liability legal issues. The policy could also prevent liability legal issues through the legal requirement of a notarized document stating that nothing outside of coverage bounds can be claimed and that the client clearly understands the coverage they have purchased. A protective policy would ensure that printing firms understand the insurance coverage they are purchasing and prevent insurance companies from taking on the consequences of unseen bad risks.

5.6 Implications for Industry

Beyond academia, it is recommended for insurance companies to demonstrate to printing firms how much of a positive influence they are in environmental health and safety performance and that they make the services they provide to clients well known. This demonstration could increase the importance of insurance in management systems. Insurance companies should consider developing a less transactional relationship with their printing industry clients.

It is also recommended for printing firms to actively seek guidance and openly communicate with insurance companies to help meet their environmental health and safety goals. If a printing firm's insurance carrier is not as helpful as this study finds the carrier could be, then the printing firm may wish to change their insurance carrier for both environmental and health and safety insurance. Survey analysis suggests that the person most likely involved in insurance, the CFO, is not a member of the printing firm's environmental health and safety department or the same person responsible for environmental health and safety. This could be a potential disconnect in printing firms because if different, the person responsible for environmental health and safety could not be aware of the helpful services their insurance company may provide.

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Appendix

Appendix A: The interview guided used for the interview portion of this study.

Industry Guide

1. Introduction and Consent
2. Tell me about your company.
3. Tell me about your role in the company and what your background is.
4. Who in the company has the most interaction with the insurance provider?
5. Do you have the same insurer for all of your environmental insurance needs?
6. Do your insurance policies related to environmental liability or loss have any specific performance or practice requirements in them? If so, what are they and are they different from those required by regulation?
7. Is your insurance company a resource for achieving your environmental, health and safety goals? If so, could you provide specific examples?
8. Has your insurance provider helped your company improve its environmental, health and safety performance? In what way?
9. Is there anything that the insurance company has not done that you would like them to do to help you enhance your environmental performance?
10. If I have additional questions in the future, may I please get in contact with you?

Insurance Industry Guide

1. Introduction and Consent
2. Tell me about your company.
3. Tell me about your role in the company and what your background is.
4. Who in the company has the most interaction with the manufacturers that you insure? What is the nature of this interaction?
5. Do your insurance policies related to environmental liability or loss have any specific performance or practice requirements in them? If so, what are they and are they different from those required by regulation?
6. Do you view yourself as a resource for your clients to help them achieve their environmental, health and safety goals? If so, in what way?
7. Do you have any examples of how you have helped a client improve their environmental, health and safety performance?
8. If I have additional questions in the future, may I please get in contact with you?

Appendix B: Level 1 and Level 2 coding for categorization from interview.

Illustrative words from original interview transcripts	Initial code (Level 1)	Category codes (Level 2)
"So we'll help people develop programs, implement programs, train people... Insurance companies don't like to make themselves liable for things. But if we feel like we can, we might do industrial hygiene testing, for example, or something like that, and work with them to improve."	Introduce training and programs targetted at performance	Improving environmental health and safety performance
"We're really pushing all of our clients to be a better risk, and to be a better risk is usually beyond compliance."	Requirements for coverage beyond standard	Improving environmental health and safety performance
"If someone says to me something like, 'That's what I have insurance for,' then I'm immediately like, 'You're gonna have to get it from somebody else.'"	Avoiding arrangments with possible moral hazard	Business relations
"You can send me to your best facility with your best facility manager, where everything is absolutely the best. And I'm gonna walk away and that's gonna create a report based on that snapshot in time. ... Or you can let me in, and you can show me where the cracks are, and then I help you with those."	Providing help to firms who ask for it in order to prevent loss	Insurance companies as a resource
"Let us help you improve your situation. You will result in less losses. There's gonna be less losses paid. You're gonna be a more attractive risk, it's gonna lower your premiums..."	Insurance companies want to help firms reduce risk	Improving environmental health and safety performance
"I come in, I ask a lot of questions, I need to see a lot of stuff. I'm looking for proof, I'm trying to verify. It's hard to fool me, so it can be stressful for people."	Interactions with firms can be necessarily stressful	Business relations
"They were my client for three years or four years, and what happened was they put up with me, but they weren't excited to have me walk around. Because it was an old building with lots of problems. And then I asked to look in some rooms and they're like, 'No, those are private rooms.' And I said, 'well I gotta see what's in there.' And it turned out people were living in the building."	Insurance may find and prevent major events	Improving environmental health and safety performance
"Other places loved me coming. They couldn't wait 'cause they wanted to show off what they did and the progress they made."	Firms want to demonstrate improvements in order to lower premiums and showcase themselves as good risks	Improving environmental health and safety performance

Illustrative words from original interview transcripts	Initial code (Level 1)	Category codes (Level 2)
"I would analyze the sprinkler systems and the fire safety codes to make sure that they were properly protected. I would train people on how to do accident investigations, what we call an incident investigation."	Insurance company performing risk reduction and training of firm's employees	Insurance companies as a resource
"For us, a consultation is really a focused visit on a specific series of problems or concerns that a customer has and that they want us to address on their behalf. And the remainder of our interactions are trainings."	Insurance company is looked to for advice and help with training	Insurance companies as a resource
"In some cases, our [performance requirements] are different by what's required [by law], for sure, because we have a higher set of standards."	Insurance requires more than the base government standards	Improving environmental health and safety performance
"We have zero fear of anyone looking at us and saying, 'Well, we're not gonna buy insurance from them because they're saying things contrary to my profit beliefs.'"	Insurance company is not going to compromise the importance of risk prevention for the sake of business	Business relations
"We will literally take a fledgling safety professional at one of our insureds, teach them the ropes, show them where to get the resources, teach them what they need to be doing, and then let them take their program and grow it from there."	Insurance company is willing to spend their own resources to train professionals to reduce risk	Insurance companies as a resource
"Great example is that you'll see over the course of the next few years [is] as the growth of the industrial hemp market continues to explode, the chemicals that we have out there today are not necessarily designed to cooperate with the hemp plant. So as a result, we're working with several manufacturers to ensure that products get properly labeled before they get distributed so we can avoid significant losses that would come from a poorly-labeled product."	Looks to future trends to prevent possible risks to firms before they occur	Improving environmental health and safety performance
"Once on an account we stay on the account and could have some losses that are tolerable for the risk level. We'll analyze those losses and come up with a service plan to address that."	Dedication to working with firms and lowering of risk	Improving environmental health and safety performance
"For things like worker's comp if they're having a lot of back injuries and shoulder injuries we may have our people go out to the locations where the claims are occurring and determine any corrective actions or steps and send recommendations to implement to reduce the risk."	Insurance spends resources in order to determine cause of risk and prevent further events	Insurance companies as a resource
"Sometimes I may see some [bad] operation and avoid risk."	Inspections by insurance can prevent serious risk from occurring	Improving environmental health and safety performance

Illustrative words from original interview transcripts	Initial code (Level 1)	Category codes (Level 2)
"We are looking at new technologies and there seems to be a race now between carriers and agents and companies to provide technology to reduce risk."	The higher the ability to reduce risk, the better the business	Business relations
"We have a lot of guidelines or best practices and alerts that we provide to companies."	Insurance companies provide firms with methods for reducing and preventing risk	Insurance companies as a resource
"I've had companies say to me, 'Well that's why I have insurance, right?' That's not someone who we would necessarily say is a great risk."	Does not give coverage to firms with potential moral hazard	Business relations
"We prefer companies that work with insurance, take it seriously, and want to avoid losses, not rely on insurance after a loss. We want proactive."	Prefers to give coverage and work with firms that actively try to reduce risk	Business relations
"Do they have preemployment physicals? Do they have written safety plans? What type of trainings do they do already?"	Questions the current practices of a firm and then makes suggestions accordingly	Improving environmental health and safety performance
"[A company] didn't have 'return to work' policy so that people were out full time. So I worked with them to kind of put all those processes in place and reduce the overall claim cost."	Insurance company actively helps a firm reduce risk and premiums	Insurance companies as a resource
"Some of our essential recommendations are not regulatory, but just a best practice that we want to see in place to reduce losses."	The insurance company can provide suggestions beyond that required to maintain coverage	Improving environmental health and safety performance
"Some [companies] rely on us more than others obviously, but we're certainly a resource. We have companies reach out to us regularly for assistance and guidance."	Firms need various levels of assistance and guidance in reducing risk	Insurance companies as a resource
"There are accounts where we say, 'No, this is totally unsatisfactory. Nothing can be done to improve it.' Then, you know, we may not write the account because it's too risky."	No account will be written only if no improvements to current risk could occur	Business relations

Appendix C: The combined survey questions for printing firms sent through Qualtrics.

Section 1:

What is the total number of employees in your facility?

- Less than 50
- 50-100
- 100-500
- 500+

In which state is your printing facility located?

What industry segments do you serve? Select all that apply.

- Commercial Printing
- Packaging Printing and Converting
- Book Printing
- Magazine Printing
- Newspapers
- Transactional Printing
- Label Printing
- Reprint

What printing services or applications do you offer? Select all that apply.

- Binding and Finishing
- Design
- In-house
- Marketing
- Prepress
- Printing
- Product
- Publishing
- Vendor
- Web Media
- Other: _____

Do you have the following types of presses in your facility? Select all that apply.

- Lithography Sheet-fed Offset
- Lithography Web Offset
- Gravure
- Flexographic
- Letterpress

- Screen printing
- Other _____
- We don't have a printing press

What Environment Health and Safety certifications do you have? Select all that apply.

- ISO 14001
- ISO 9001
- EPA Design for the Environment
- The Improvement Professional in Print (IPP) certification
- Sustainable Green Printer (SGP)
- OHSAS 18001
- Green Press Initiative
- Other _____

Do any of your paper products or purchased printing materials have the following certifications?

	None	Some	All
FSC Certification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable Forestry Initiative (SFI)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Programme for the Endorsement of Forest Certification schemes (PEFC)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EPA Green Chemistry Project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chlorine Free Products Association	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 2:

Does your company have a dedicated environmental manager?

- Yes
- No

Does your company have a dedicated health and safety manager?

- Yes
- Yes, the same person as the dedicated environmental manager
- No

What is the total number of full-time employees involved in environmental, health and safety?

What is the total number of part-time employees involved in environmental, health and safety?

Has your facility engaged any of the following activities to improve environmental performance?

	Yes	No	Don't Know
Conducted pollution prevention planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managed and/or reduced ink usage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managed and/or reduced chemical usage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managed and/or reduced toxic chemical emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managed and/or reduced water usage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Managed and/or reduced energy usage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Does your company have a designated person that interacts with your insurance company(ies)?

Yes (please state the title or role of this individual)

No

More than one person (please state the titles of these individuals)

Don't Know

How likely is it that you would go to the following sources to get information on possible incoming environment, health and safety liability items (e.g. ink or chemicals) ?

	Extremely likely	Somewhat likely	Neither likely nor unlikely	Somewhat unlikely	Extremely unlikely
Suppliers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government Regulators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Industry Association	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Printers in my Professional Network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insurance Provider	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 3:

Do you have health and safety insurance?

- Yes
- No

Of the following, which health and safety insurance type(s) do you have? Check all that apply.

- Occupational Health and Safety
- Workers' Compensation
- Accidental Medical Coverage
- General Liability
- Professional Liability
- Occurrence Policy
- Other: _____

How often does your Health and Safety insurance provider inspect your facility?

- Monthly
- Semi-Annually
- Annually
- Greater than one year
- They do not inspect our facility

In your relationship with your **health and safety** insurance provider, please answer the following.

Choices: Strongly agree, Somewhat agree, Neither agree nor disagree, Somewhat disagree, Strongly disagree

- My company will contact our insurance for advice on potential liability issues.
- My company uses the advice given by my insurance provider.
- My company views our insurance provider as a resource for information.
- My insurance providers sets higher policy standards compared to what is required by regulation.
- My insurance provider keeps us well informed of current and new government regulatory requirements.
- I am satisfied with the overall performance of the business relationship I have with my insurance provider.
- My insurance provider has helped my facility improve its environmental, health, and safety performance.

In your relationship with your **health and safety** insurance provider, please select the best answer for each of the following.

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I believe that my insurance provider will work with me to give me the best coverage possible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable sharing information with my insurance provider.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel facility visits by my insurance carrier are a nuisance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you have insurance related to environmental liability?

- Yes
- No

Of the following, which environmental insurance type(s) do you have? Check all that apply.

- Environmental Impairment Liability
- Contractors Environmental Liability
- Premises Pollution Liability
- Pollution Legal Liability
- Storage Tank Coverage
- Transportation Pollution Liability
- General Liability
- Products Pollution
- Other: _____

Are your environmental insurance and health and safety insurance from the same company?

- Yes
- No

In your relationship with your **environmental** insurance provider, please answer the following.
Choices: Strongly agree, Somewhat agree, Neither agree nor disagree, Somewhat disagree, Strongly disagree

- My company will contact our insurance for advice on potential liability issues.
- My company uses the advice given by my insurance provider.
- My company views our insurance provider as a resource for information.
- My insurance providers sets higher policy standards compared to what is required by regulation.
- My insurance provider keeps us well informed of current and new government regulatory requirements.
- I am satisfied with the overall performance of the business relationship I have with my insurance provider.
- My insurance provider has helped my facility improve its environmental, health, and safety performance.

In your relationship with your **environmental** insurance provider, please select the best answer for each of the following.

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I believe that my insurance provider will work with me to give me the best coverage possible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable sharing information with my insurance provider.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel facility visits by my insurance carrier are a nuisance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 4:

Has any of your insurance providers ever offered you any safety or risk training programs?
Select all that apply.

- General workplace safety
- Lockout-tagout
- Fire safety
- Hazardous waste
- Spill prevention
- Personal protective equipment
- Other: _____

In your relationship with your insurance provider(s), please select the best answer for each of the following.

Choices: Strongly agree, Somewhat agree, Neither agree nor disagree, Somewhat disagree, Strongly disagree

- My insurance company has helped me manage my chemical inventory.
- My insurance company has helped me train my employees in workplace safety.
- My insurance company has helped me train my employees in environmental event prevention.

- My insurance company has helped me understand various types of environmental, health and safety insurance coverage.
- My insurance provider has given me access to certified loss control professionals for advice.
- My insurance provider has reviewed my safety systems (e.g. fire sprinkler).
- My insurance provider has helped me with incident investigations.
- My insurance provider has helped me review my product quality process.
- My insurance provider has helped me with my overall environmental, health and safety management systems.