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Framework for Evaluating ESG Risk in Supply Chains

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ABSTRACT

Consulting firms are constantly looking to modernize their portfolio of tools used to analyze supply chain risk. One of the new trends in business is the concept of ESG (Environmental Social Governance). Now, there are no publicly available frameworks for analyzing and reporting on ESG risk in supply chains. The purpose of this thesis is to create a framework that analyzes the impacts from supply chain operations in the ESG realm and then evaluates risks associated them.

In this framework, first the potential impacts a supply chain may have across the three sectors of ESG are defined. Then, the supply chain in question can be paired with the impacts associated with its' operation and then the level of risk can be assessed. The framework was created through research on frameworks in other areas of business along with advising from an industry consulting firm. The result is a framework that can be used to analyze, categorize, and evaluate risks related to ESG topics in an organization's supply chain.

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Chapter 1

Introduction

The topic of this thesis will be building a workable Environmental Social Governance (ESG) framework. The framework is being created for use by LMI a government consultancy. The end goal is a framework with the capability to examine aspects of LMI's customers environmental, social and governance impacts. This would allow LMI to help its customers grow responsibly and mitigate risks.

To understand why this is a relevant topic, first it must be considered that business has direct and indirect impact on environmental, social and governance factors. In the past these factors had been overlooked for the sake of easy growth and lack accountability.

Current trends are pushing for increased accountability for businesses and governments alike and this creates a need for understanding and judging how corporations impact the environment and people. There is no simple way to understand the effects a business or similar group may have across the three ESG buckets, but a framework works to simplify and outline those impacts and aid in understanding where they come from inside an organization.

The world has begun to care more about ESG impacts from organizations and businesses and with. Those businesses are benefitting from understanding the impacts they have in these three buckets. The framework will help LMI to understand, rate and improve the ESG impacts of their client organizations. This will be a helpful tool because having a better understanding of these impacts helps mitigate risk, build, or maintain positive reputations, keep stakeholders happy and much more.

For these reasons LMI is interested in having a framework to analyze the ESG impact of their clients. It would add benefit to their services and allow their clients to receive more from working with LMI.

Preliminary research began by simply conducting background research to understand the basics of what ESG means. Results uncovered useful information by looking into ESG investing in the financial world and understanding why people invest in ESG funds, how banks determine what to include in their ESG funds and the history of ESG and investing.

Then, research became scouring the internet to find examples of ESG frameworks that already exist to get an idea of what has already been created. Doing this gave clues as to where to further research to gain a better understanding of any of the pieces of what makes up the three sectors of ESG. There was no room for questions about which topics should be included in the final framework.

After finding the frameworks that already exist, it was possible to do more focused research online of different impacts that organizations can have on ESG topics. These impacts are what the framework will eventually rate the organizations on, helping them and LMI to improve supply chains and mitigate risk.

The remainder of the thesis will contain information on the process of how the ESG framework was constructed. Details explaining what choices were made and why. And finally, the ESG framework that was presented to LMI.

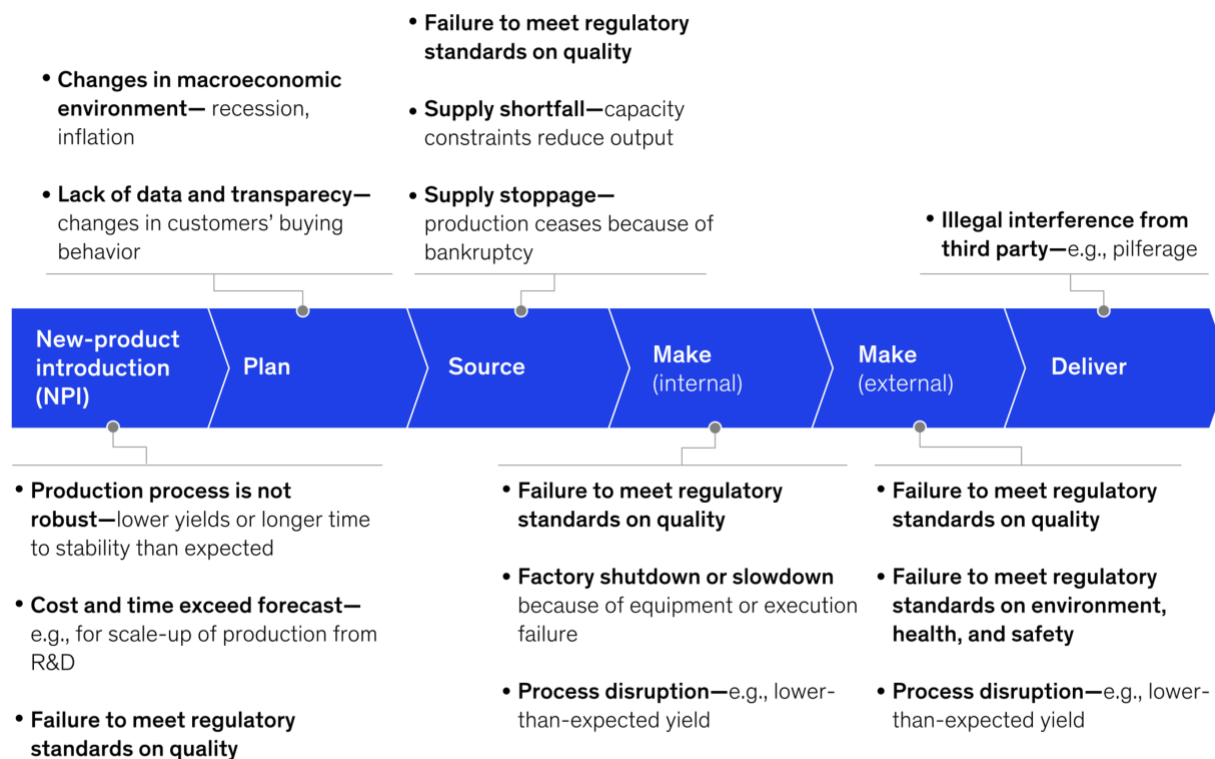
Chapter 2

Background

Supply chain risk is not a new or understudied topic. Major consulting firms around the world have been providing their services to analyze and assess risks in supply chains in every type of organization imaginable.

Typical preexisting approaches towards supply chain risk analysis may involve laying out the supply chain for individual products (Figure 1). Then, using a framework, consultants can assign scores or values to each potential or real risk to understand areas with the greatest potential for risk. Finally, organizations can implement changes to their operations as needed to reduce risk exposure. This type of framework can be applied to more specific areas including evaluating risk from specific topics including those related to ESG.

Assess value-chain nodes to identify key risks.



McKinsey
& Company

Figure 1. Example of Risk Identification from McKinsey & Co.

ESG Background

On the ESG side of things there is a current trend for organizations to recognize and react to ESG factors. The rise of ESG principles began with the United Nation's Principles for Responsible Investing (PRI) report. This report brought ESG into the light for investors seeking to build socially responsible portfolios. This trend is something that is continuing to define the ESG movement. The phrase is commonly associated with investing and the financial sector as it is used as a tool to help check companies in relation to ESG standards.

Most commonly, the term ESG is used to describe investments and criteria for differentiating organizations. Shareholders, consumers, and the public are now expecting to see companies setting positive examples through the interactions with the environment, communities, and governments. Environmental covers how organizations impact nature and the environment. Social relates to the impact on people, communities, and social justice initiatives. Finally, governance looks at the relationship companies have with governments and the regulations they follow.

In terms of ESG and supply chain there has always been a direct correlation to supply chain practices and ESG. This relationship though was always brought forward as something investors were interested in. It has only been recently that organizations have begun to take an active interest in understanding their impacts supply chain practices have. This is in part because of a general shift in public sentiment. People now expect to see companies—both private and public—work to be socially and environmentally responsible. Consumers look to buy products from sustainable supply chains if possible.

Examples from the industry right now come in many shapes and sizes. One big one is Patagonia. They have turned environmental and social responsibility into their core business value. This has driven them to “measure, reduce and eliminate the environmental impacts of manufacturing Patagonia products and materials” (Patagonia 2022). The company collaborates with their suppliers and manufacturers to create responsible products that consumers want to buy. Constantly checking that their partners meet minimum service requirements ensures that their supply chain sees minimal environmental risks and gives customers peace of mind when they shop for Patagonia products. They have become a model for other organizations to build a responsible supply chain.

Current trends in business are moving towards decarbonization, reducing social inequalities, and eliminating negative waste into the environment. Many companies are moving in this greener direction, and it is quickly becoming the norm. However, to get ahead of competition would be a significant benefit. This is where some companies struggle because of lack of knowledge of what can be done to take the next step in responsible practices.

These companies now are looking towards consultants to help them analyze their supply chains from ESG perspectives. Typically, consulting firms may look to use frameworks when they look at analyzing risks. There are some existing frameworks that can be used for ESG as an overarching category. The most prolific framework has been published by the Global Reporting Initiative (GRI). GRI has a lengthy report outlining standards and best reporting practices for organizations to report on themselves in comparison with their specific sectors.

This specific report is excellent at incorporating the UN 17 Sustainable Development Goals (SDGs) into the framework. These goals were accepted by the UN in 2015 as goals for the world to be working towards as a collective seeking to create a more equitable, healthy, and prosperous world for everyone while preserving the environment.

The UN SDGs are one the core standards for looking at ESG. They range in topics from clean water and sanitation to quality education and economic growth. These goals are extremely useful in the realm of ESG to be used as guiding topics to ensure organizations are operating responsibly. Some frameworks use these UN goals to highlight impacts businesses have on those goal categories.

ESG Frameworks

However, in the realm of ESG related risk frameworks, there is not a lot of material that already exists. The existing frameworks for evaluating supply chain risk do not focus on ESG topics. The ESG evaluation frameworks that do exist do not focus specifically on supply chain but cover the entire businesses or sectors. The current frameworks that exist are seemingly very broad and not applicable to supply chain and operations on a detailed level.

The goal with creating a framework is to first find risk, then understand risk which allows risk to be managed. To move from risk to managed risk is a huge deal for many companies and something they are willing to pay consultants top dollar to achieve. This makes putting together an ESG risk evaluating framework valuable especially for consulting firms looking to help clients understand and manage supply chain risk.

Overall, an ESG supply chain risk analysis framework is not something that is publicly available now. It is likely that consulting firms may have their own in-house frameworks for use by their consultants, but any examples of these online are lacking in detail.

Chapter 3

Methodology

The methodology used to build this framework involves finding topics that create risk and learning how to judge that risk. Risk in supply chain often tends to associate with impacts that specific supply chain nodes cause. For example, there is risk associated with poor waste management along the supply chain. Having too much waste or disposing of it in a harmful way can put the reputation and market share of a company at risk if the public were to find out. Consumers would likely not buy from a company especially if it was dumping waste into a local environment.

To accurately describe the risks associated with poor environmental, social, or governmental supply chain management, research for this thesis mainly used secondary source analysis as well as guidance from a primary source. Background research conducted via analyzing online sources was the building blocks for understanding the impacts supply chains have in the three ESG buckets. Regarding the background of supply chain information, this thesis relied upon the scholarly knowledge from an education through Pennsylvania State University as well as through guidance from industry professional, Scott Ritzel. Ritzel was able to use his experience to suggest which topics to focus on and where the industry currently values risk management.

Using secondary as well as primary online sources was the other main method used in writing this thesis. This research was used in building the topics that generate possible risk in the framework as well as understanding the human impacts those topics have beyond the supply chain. This source analysis guided the formation of this ESG risk evaluation framework.

Chapter 4

Framework Outline

To begin, the framework will have five steps which will produce a rating of the level of ESG related risk in any given supply chain.

Step 1 will be identifying all relevant ESG topics for the supply chain to be evaluated. Many possible topics were outlined with their impacts in this thesis already. However, there are more possible topics that may be more niche or industry specific. While using the framework, additional topics can be used as necessary.

Step 2 identifies the organization's context. This step is helpful to determine the full range of activities an organization may have an impact on. Often it can be easy to overlook impacts which occur through supply chains when they are removed from the immediate line of business relationships. It is also helpful to consider an overview of potential stakeholders at specific points in the supply chain to identify all impacts.

Step 3 will be to evaluate the impacts the organization or its business partners have in each of the identified topics related to ESG. It is important to consider all connections in the supply chain. Each business or organization involved has specific impacts and should be noted to determine the true risk level for a supply chain. Describe the impacts that create supply chain risk and how these risks are responded to internally and externally to help build risk awareness.

Step 4 is to assess the most important topics in relation to an organization's supply chain operations. Inevitably organizations will have many topics to report on. However, some will be more significant or relevant than others. It is useful to understand what the most significant topics are so that there can be a thorough evaluation of potential risks within.

Step 5 is the final step in the framework. To summarize findings and report on the whole of ESG related supply chain risk there should be an overall risk level assigned after all prior steps have been completed. Doing this will make for easier reporting on supply chain risks. The goal is to be able to describe the level of risk concisely with the overall supply chain risk level.

Chapter 5

Step 1: Identify Relevant ESG Topics

Step one to using this ESG risk evaluation framework is to identify all relevant environmental, social or governance topics. It is important to evaluate supply chain risk only on the topics that are related to each organization's specific supply chain. However, every organization has a web of partners, suppliers, and distributors. Failing to identify topics that correspond to others involved in the supply chain will produce an inaccurate evaluation of a supply chain's risk.

Identifying topics is perhaps the most important piece to creating effective risk evaluations. If there are topics missing that contribute to an organization's risk portfolio a supply chain may seem less at risk than is the case, or vice versa.

To identify topics under the three buckets of ESG, a good starting point would be to use the topic lists in this thesis. The lists contain possible topics that relate to many supply chains through impacts that are environmental, social, or governmental. These topics correlate with the U.N.'s seventeen goals for sustainable development. These are goals in place which outline what should be achieved in our world to have a more sustainable and equitable world for all (United Nations 2015). Using these goals as a benchmark or reference for topics in the framework helps to frame and provide insight on why each ESG related topic is important. The topics are also useful in creating a plan to manage any risk that is uncovered through the framework. The risks associated with each topic will be clearly related to each topic or supply chain function, this allows them to be focused on at more depth as necessary.

To identify relevant topics, one should work to identify all possible topics first. This allows for a first draft to be made. Then, upon consulting with managers in supply chain and/or stakeholders in business partners from elsewhere along the supply chain, the topics can be discussed and agreed upon to ensure nothing is missing. Additionally, supply chains have topics that can be unique by industry, organization, or geographic location. Due to uniqueness, the framework is not an exhaustive list of all possible topics and impacts associated with supply chain risk. Additional topics should be included on an as-needed basis to give a full view of risk.

The suggested process to identify these risks is to use a scale from one to five of risk likelihood through each topic. The scale would be from a one or “rare” chance of happening to “highly likely” at five. As an example, identify the likelihood of corruption along all portions of a supply chain. Depending on company policies, countries of operation, and suppliers, there could be varying levels of risk. If there is at least a possibility of that topic risk being realized, then it should be included in the evaluation of risk.

Chapter 6

Step 2: Identify Organizational Context

Step two in working through the framework is to identify unique organizational context. Every supply chain exists in a specific organizational context which is important to consider when analyzing and understanding risks. Organizational context will not be contributing directly to the rating or evaluation of risk. However, it will contribute to the topics identified and how risk is perceived for those topics.

To understand the context an organization operates in is necessary when evaluating risk. For example, an organization that produces baby food would need to be extremely strict regarding quality control of its' manufacturers. A mishap with its' product where it was contaminated because of poor manufacturing practices or faulty packaging could be harmful to babies. This could easily end up ruining the company because parents will not be buying food from a company that has a poor reputation or a history of causing illness in children.

On the other hand, a company producing tar for paving roads would not need to worry as much about contamination of its' product. If a few bugs ended up in tar, it would still be paved on the road, and nobody would likely know or care. In summary, it is important to recognize which areas of the supply chain are most important to the individual organization. It would not make sense to rate risk the same way for two supply chains operating under different circumstances.

Beyond realizing the unique circumstances of business, this step should be used to identify all key players in supply chains. A useful list of common areas that could be missed is below:

1. Raw Material Sourcing
2. Suppliers
3. Manufacturers
4. Transportation
5. Distribution
6. Retail
7. End Use
8. Reverse Logistics
9. Waste Management

It is helpful to consider each step in the supply chain as its' own entity. Even though the manufacturing of an item may be outsourced, that company manufacturing the item can have an impact on risks for the main organization's supply chain. If a manufacturer is polluting a river in China, that poses risk to those upstream in the supply chain. If they were to be shut down or fined heavily there could be loss of that supplier or a disruption. This goes to prove that considering all aspects of a supply chain help to build the most holistic view of ESG related supply chain risk.

This step is in place as an exercise to ensure accuracy in the final risk evaluation. It would be potentially dangerous to go forward without a purposeful move to consider exactly where impacts are occurring along the supply chain and thus around the globe.

Chapter 7

Step 3: Evaluate Potential Impacts of Topics

Step three is to evaluate the potential risk impact of the topics that are determined to be relevant to the supply chain. After determining which topics are most aligned with the supply chain at hand and considering operations from top to bottom in the supply chain it is time to investigate the risk.

This is where each topic is taken in detail to understand where risks arise. Examples and short descriptions are given above in the chapters for topics of the three ESG buckets. A good way to do this is to use the “Topic Reporting Framework” tab in the Framework Excel file. This tab is organized to promote note taking about individual topics. Creating a list of possible impacts allows for easy visualization of impacts and facilitates thought on the significance of those impacts.

The overall level of potential of these impacts will be rated here as well. The rating will be on a scale (1 – 5). From negligible impact (1) to very severe impact (5). The rating takes account for all possible impacts associated with the topic. For example, if reporting for a nuclear power plant one would report risks for the topic of local communities. Those risks may include the possibility of nuclear waste contamination and possible meltdown. This would be considered a very severe impact to the local community and would be scored a “5” for potential impact.

Chapter 8

Step 4: Assess Topics by Importance

Step four is to assess each of the previously chosen topics based on their importance to the organization. This can be importance based on having a key role in business operations or importance to an organization's values or goals. Understanding what an organization holds to be important is useful to understand what the results of the risk evaluation framework mean.

Like step three, the "Topic Reporting Framework" tab on the framework Excel file contains space to include notes on topic importance.

This step does not contribute directly to the risk rating. However, this is important for understanding why the risk matters. Organizations have motives to work to mitigate and understand their ESG risk in supply chains. This section allows for discussion on that.

To place significance behind the risk evaluation given through using this framework this is a crucial step. Organizations are generally looking to make the step to become more environmentally friendly and socially responsible. However, each supply chain or organization may hold special significance to reducing risk in specific topic areas. Reporting on importance allows for understanding what really matters to organizations and if they will use the report to drive change, they may look to change in areas of most importance rather than riskiest.

Chapter 9

Step 5: Summarize and Report Findings

The first steps of the framework are a useless exercise without successfully summarizing and reporting on the results. This step is included to ensure that the risk evaluation framework can be a useful tool, not a meaningless exercise. This chapter will describe the suggested methods of reporting on the findings of the framework so that there can be a next step in managing the risks found.

The attached “ESG Risk Evaluation Framework” Excel file includes the suggested steps to generate a concise report while reporting on topics related to ESG risk. That file includes a “Framework” and “Topic Reporting Framework” tab to report and compile notes on individual topics. The first tab is best used as the main landing spot for logging information about relevant ESG topics. Then, the second “Topic Reporting Framework” tab is a great way to take notes on each of the specific topics. Copying this tab to use for as many different topics as needed is a smart way to go about using it.

Using that file as a resource to guide through the process of analyzing risk across ESG topics in the supply chain will help in providing a final summary. The Excel model provides a final risk rating when used correctly. By grading the likelihood and potential impact levels of the risks associated with each topic then the topic will then receive a risk rating as determined by the matrix (Figure 2). These ratings then are averaged together to find the average level of ESG risk in a given supply chain.

Risk Matrix

Impact	Very Severe	5	5	10	15	20	25
	Severe	4	4	8	12	16	20
	Moderate	3	3	6	9	12	15
	Minor	2	2	4	6	8	10
	Negligible	1	1	2	3	4	5
			1	2	3	4	5
			Rare	Unlikely	Possible	Likely	Highly Likely
			Likelihood				

Figure 2 Risk Matrix

Upon filling out the model and receiving the average risk level these findings from Excel can be easily transferred to a presentation or used similarly to be digested by those on the decision-making level so that changes can be made to reduce risk exposure.

Chapter 10

Environmental Topics

Below are the topics that were found to be most relevant to the three ESG sectors in supply chain. These topics are areas where operations create impacts in such a way that risk is possible. This section will introduce those topics in the environmental sphere as they will be used in the framework to analyze supply chain risk.

Sourcing of Materials

Are materials sourced in an environmentally responsible way? Are the sourced materials easily sourced, or is there a complex process involved that may produce more carbon emission along with other possible environmental impacts?

It is important to understand the sourcing process of any components used by the organization. Many internationally sourced products come from areas of the globe with less stringent environmental protection laws. The laws may not currently be in place, but to minimize risk it is important to consider the likelihood that countries will continue to improve their environmental protections. This may lead to changes in sourcing through changes in price or availability of certain goods. Vendors who source in environmentally conscious ways can reduce risk exposure from boycotts, changes in consumer behavior, or unfavorable brand reputation. Otherwise, there are significant risks including those for organizations not considering the environmental impacts of their sourcing. If they do not consider it, someone else will.

Material Use

How are materials used by the organization? What type of consumption of materials is happening?

Material use is something every organization should be conscious of to be able to mitigate environmental impact. If possible, materials should be recyclable, reusable or managed to reduce waste. Manufacturing can also lead to greenhouse gas (GHG) emissions depending on what materials are used and how they are used. Organizations should consider the ways in which they use materials and possible ways to mitigate environmental risk in using those materials.

Waste

What is not able to be used and what will be discarded? What types of waste are being produced? What ways is waste being discarded? Are there efforts to first reuse, then repurpose and finally recycle?

Waste is an important factor in determining the environmental impacts of an organization. If waste is not responsibly managed it can contaminate drinking water, pollute ecosystems, even harm humans. Major risks result from irresponsible waste management at any part of the supply chain. By ensuring the waste is being managed responsibly in the sourcing and manufacturing part of the supply chain, an organization can reduce risk associated with mismanagement of waste. The reputational risk associated with poor waste management can also lead to a loss in market share.

Water Usage

Access to fresh water is a commonly recognized human right. Organizations consuming or using water impact local ecosystems and human access to that water especially based on the quality of the water (if any) discharged after it is used. One of the UN Sustainable Development goals is to ensure availability and sustainable management of water for all.

Because water is a shared resource, the impacts here can stretch beyond the ecological. The importance of water for local and indigenous populations can have economic and social impacts as well. Beyond the environmental factor, contamination or misuse of water can severely harm people as well. This can easily stretch from an environmental risk to also social and even governmental. Water is a precious resource - a quick way to create risk is to abuse it.

GHG Emissions

Greenhouse gas (GHG) emissions can come in more ways than one may expect. They can be more than the exhaust from cars, ships, or planes. Emissions can be a byproduct of manufacturing and sourcing as well as energy usage. Using electricity sourced from fossil fuels such as coal often produces larger than necessary amounts of emissions.

GHG emissions have been a global issue for decades and the largest contributor to climate change. Risks associated with GHG emissions extend to contributing to climate change. Extreme weather events associated with climate change can disrupt supply chains anywhere on the globe. Also, there are risks in being misaligned with current energy trends. As the world is moving towards a cleaner future in terms of its' emissions, it could be a poor business decision to rely on energy from fossil fuels when renewables are a growing option. Currently there are steps

being implemented to reduce emissions globally to improve the quality of air in the Earth's atmosphere. Many countries have regulations regarding emissions and are willing to fine organization not in compliance. Consumers also expect to see business following more sustainable practices with less emissions than in the past, otherwise a negative reputation may form.

Procurement Practices

During the procurement process suppliers should be evaluated in part through an environmental impact perspective. Each supplier included in the supply chain has a unique environmental impact. It is important to integrate environmental thinking into procurement to ensure that the decisions being made are positive for organizations and the environment both locally and globally.

It may be smart to consider procurement practices from two perspectives. One being the in-house perspective. Is everything happening on the organization's side of things being environmentally considerate? If the organization is managing procurement with a thought to be environmentally responsible, they can hope to stay in good standing with consumers, their partners, shareholders and/or the government. On the other hand, the practices of business partners should be considered. Associating or giving business to groups who have negative environmental impacts can sometimes be as bad as doing it directly. It also leaves the risk of seeing supply chain disruptions due to actions taken against the business that is not managing its environmental impacts.

Chapter 11

Social Topics

Below are the topics that were found to be most relevant to the three ESG sectors in supply chain. These topics are areas where operations create impacts in such a way that risk is possible. This section will introduce those topics in the social sphere as they will be used in the framework to analyze supply chain risk.

International Labor Laws

There are laws and regulations set by countries and organizations alike with the purpose to ensure that worker's rights and safety are being considered. If those laws are not being followed, there are associated risks.

It is important to consider that employment should always be a legal relationship between the employee and the employer that provides rights and responsibilities to both parties. Many standards for international labor law comes from the International Labour Organization (ILO) and UN. It is in an organization's best interests to adhere to labor laws and take actions to support the associated Sustainable Development Goals. Unfair labor practices can also disrupt supply chains by halting movement of products through unionized or nonunionized striking activities due to poor conditions or treatment.

Child Labor

While there are laws in place in most nations outlawing child labor it is still in practice. Major concerns surrounding child labor arise in the sourcing of products from overseas. Suppliers may operate in countries with minimum working ages below the age set by the International Labour Organization (ILO).

Child employment itself is not a social issue. However, child labor at ages below the ILO minimum age convention is defined as human a rights violation. Children under eighteen are prohibited from doing any form of hazardous work. Child labor deprives children of their childhood and education and is potentially harmful to their mental and physical development.

Organizations are expected to do their due diligence to ensure there is no part of their supply chain or sourcing partnerships that abuse children for labor. Contributing to or supporting child labor in any way should pose a major risk to any organization.

Occupational Health and Safety

Healthy and safe working conditions are recognized as a human right and included as targets in the UN's Sustainable Development Goals. Promoting healthy and safe working conditions involves both prevention of physical harm and consideration of mental well-being.

In the perspective of procurement and supply chains, occupational safety is a factor meant to be considered and accounted for in all organizational operations. While more developed nations have strict labor safety laws, this is not the case in nations where manufacturing commonly occurs. Lack of supply chain visibility can put workers at risk. This can place organizations themselves at risk of poor performance due to high worker turnover, legal

punishment, or loss of suppliers if legal actions are taken on suppliers downstream in the supply chain.

Local Communities

Organizational activities, procurement and supply chains do not happen in vacuums. It is extremely important to consider the impacts actions have on the local communities. Ensuring a positive relationship with local communities mitigates risks possible when working alongside or in those communities.

When procuring, it is an organization's responsibility to do due diligence to understand their impact on local communities. Showing lack of care towards locals reflects extremely poorly on an organization. Poor community management can be reflected by destruction of natural resources or the environment that is used locally, pollution at a local level, economic impacts and/or infrastructure impacts.

Economic Impacts

All decisions made by an organization result in economic impacts, whether they are positive or negative. It is an organization's responsibility to ensure that the impacts created by their actions are on the positive side. Generally, economic impact can be defined as the change in productive potential of an economy.

Procurement specifically has the power to make significant economic impacts on local levels because of the flow of money that it creates. Procurement brings positive economic impacts as it can create jobs and develop local infrastructure especially if there is a low

development level locally. Organizations can make efforts to create positive economic impact with their procurement.

Economic Inclusion

Procurement can positively affect the economic inclusion by seeking to use businesses that are small, woman owned, and/or employing at-risk or underserved minorities. The UN Sustainable Development Goals seek to promote economic inclusion as it can be a tool to build communities, increase the general well-being of people, and promote equality. Economic inclusion can also be a tool used to strengthen supply chains. By practicing economic inclusion, the newly included businesses often realize improved processes, talent acquisition and overall growth which allows for stronger partnerships in the supply chain.

Modern Slavery

Many countries have been able to eradicate slavery and similar practices from their workforces. However developing nations are not always up to speed. Visibility is crucial to be able to see possibilities of modern slavery at any stage of the supply chain.

There are major risks involved for organizations benefitting from modern slave labor. Organizations should be actively looking to ensure there is no possibility of slavery in their supply chains to ensure the least amount of risk for themselves. To allow for a more equal society with opportunities for all parties to realize socio-economic advancement, it must be ensured that modern slavery is not supported directly or indirectly.

Procurement Practices

Procurement practices of an organization can lead to impacts beyond the parties immediately involved. Socially conscious procurement can be a tool to help fight inequality and poverty.

Poor procurement practices can lead to negative impacts on the supply chain as they can bring in suppliers that negatively impact business. It is important to consider an organization's support for local communities as well as suppliers led by women, minorities, or other vulnerable groups.

Chapter 12

Governance Topics

Below are the topics that were found to be most relevant to the three ESG sectors in supply chain. These topics are areas where operations create impacts in such a way that risk is possible. This section will introduce those topics in the governmental sphere as they will be used in the framework to analyze supply chain risk.

Corruption

Corrupt business practices are illegal in many of the world's developed nations. However, in many areas where manufacturing and shipping occur, these practices still actively happen.

Corruption has been linked to numerous negative impacts including, but not limited to environmental damages, human rights abuses, exacerbating political instability and abuses of democracy. Also, corruption can lead to counterfeit parts entering the supply chain including diluted pharmaceutical ingredients and rare earth minerals. This can lead to fraudulent or non-functioning products. Organizations caught up in something like this can see severe sanctions or even be driven out of business.

In the supply chain specifically, a lack of visibility can lead to creating risk for corruption. Organizations are expected to demonstrate and practice their adherence to integrity in all their business practices.

Anti-Competitive Behavior

Engaged in procurement with organizations that promote or exemplify anti-competitive or monopolistic behavior is a significant risk in supply chains. It can impact consumer's choices, pricing, and promote inefficient markets. To fight these negative impacts, many countries have legislation in place to fight anti-competitive practices.

If organizations are found engaging in anti-competitive practices, they can face significant legal action. These legal actions carry risk of significantly disrupting activities anywhere along the supply chain as well as real legal risk. For example, engaging in anti-competitive behaviors can lead to potential loss of suppliers if they are found to be acting monopolistically.

International Trade Laws

Adherence to laws and regulations is without question important to mitigating risk in all areas of business. While cutting corners can save costs or reduce lead times, it can create significant risk as well.

It is important to understand, learn and follow all laws in areas where organizations are doing business. By doing so organizations can safely operate and maintain relationships in wherever they wish to extend their operations to.

Chapter 13

Conclusions

By following the steps outlined above and utilizing the attached Excel file one will have the ability to evaluate ESG risk in supply chains. The file is meant to be easy to use and equally as easy to understand or present.

To get results with the Excel file one only needs to edit the input cells. These cells are marked by their orange color and use the “input” cell style. There are two columns of these cells on the “Framework” sheet. There is one input cell on the “Topic Reporting” sheet. However, this sheet also has a note taking area to organize thoughts. There are two text boxes labeled to be used for note taking.

The result will be a table outlining ESG topics with a risk rating attached. These risk ratings represent the level of risk in a given supply chain that is associated to each ESG topic. There will also be an average taken to represent the average ESG risk in the supply chain.

Along with these resulting risk ratings there is a scatterplot that will be generated on the “Topic Risk Scatterplot” sheet. This scatterplot is very similar to the risk matrix (Figure 2). It overlays the topics to show where they land on that matrix based on their potential impact level and the likelihood that it may happen.

Using these tools and the framework one can understand the ESG risk levels in a supply chain. Then, with the help of upper-level management, the priority of addressing each risk can be decided upon. This is the first step towards reducing risk exposure and putting the framework results to work. Once risk areas are prioritized, a company can move forward in building a supply chain that is more environmentally and socially responsible as well as governmentally compliant.

Appendix A

ESG Risk Evaluation Excel File

Priority	Topic	Section	Supply Chain Function	Risk Likelihood	Potential Impact	Risk Rating
1	International Trade Laws	Governance	Multiple	4	2	8
2	GHG Emissions	Environmental	Multiple	5	4	9
3	Economic Inclusion	Social	Suppliers	1	3	5
4	Modern Slavery	Social	Suppliers	1	5	10
5	Child Labor	Social	Multiple	2	2	25
6	Economic Impacts	Social	Sourcing	4	1	6
7	Corruption	Governance	Transportation	5	2	16
8	Procurement Practices	Environmental	Suppliers	4	5	9
9	Local Communities	Social	Distribution	1	1	2
10	Anti-Competitive Behavior	Governance	Transportation	3	3	20
11	International Labor Laws	Social	Multiple	1	3	2
12	Occupational Health & Safety	Social	Manufacturing	3	3	10
13	Material Use	Environmental	Manufacturing	5	5	15
14	Waste	Environmental	Multiple	2	3	15
15	Water Usage	Environmental	Suppliers	3	1	12
16	Sourcing of Materials	Environmental	Sourcing	1	2	4

Average Risk from ESG Factors **10.5**
(Scale from 1 - 25)

“Framework”

Topic: **Sourcing of Materials**
 Section: *Environmental*
 Supply Chain Function: *Sourcing*

Risk Likelihood **2**
 Potential Impact **4**

Risk Rating **8**

Potential Impacts List

- Can use a bulleted list to easily visualize
- Fill in with notes of relevant impacts

Organizational Importance

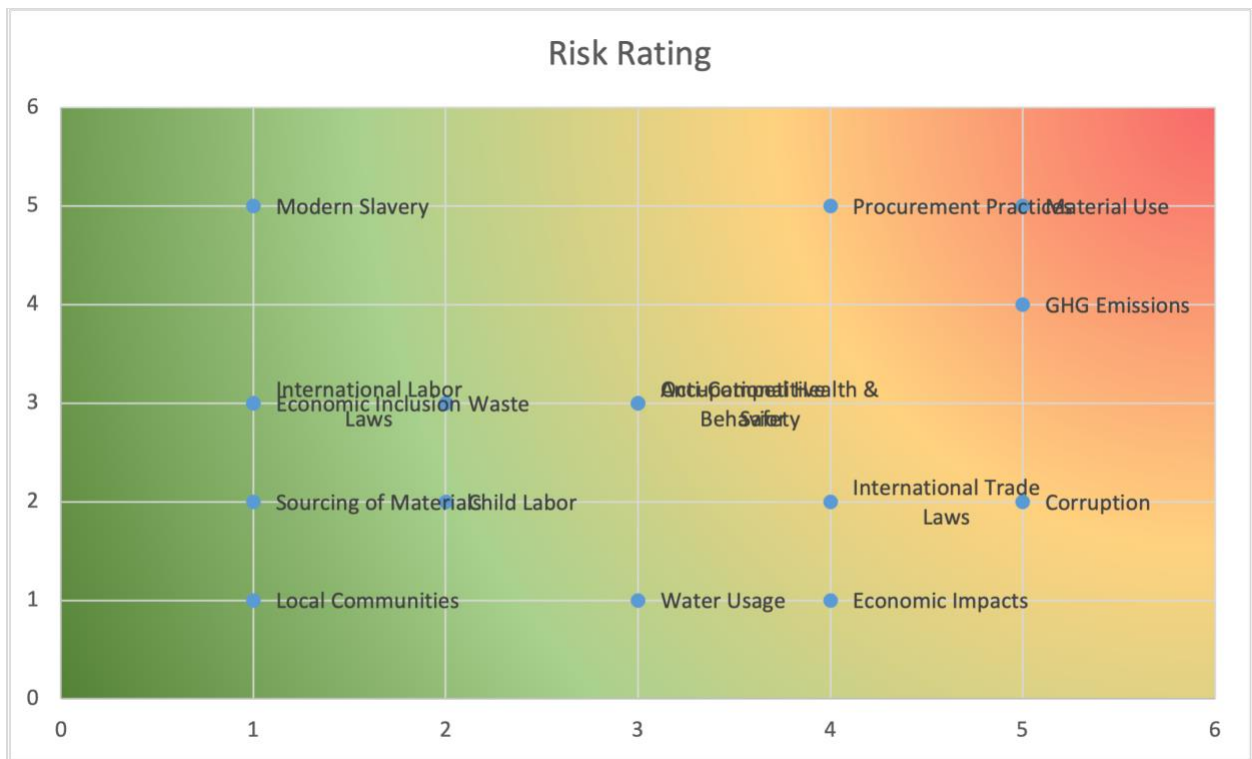
- Use this space to take notes
- Why is this topic significant?

“Topic Reporting”

Risk Matrix

Impact	Very Severe	5	5	10	15	20	25
	Severe	4	4	8	12	16	20
	Moderate	3	3	6	9	12	15
	Minor	2	2	4	6	8	10
	Negligible	1	1	2	3	4	5
			1	2	3	4	5
		Rare	Unlikely	Possible	Likely	Highly Likely	

“Risk Matrix”



“Topic Risk Scatterplot”

	1 No Poverty	2 Zero Hunger	3 Good Health and Well-being	4 Quality Education	5 Gender Equality	6 Clean Water and Sanitation	7 Affordable and Clean Energy	8 Decent Work and Economic Growth	9 Industry, Innovation and Infrastructure	10 Reduced Inequalities	11 Sustainable Cities and Communities	12 Responsible Consumption and Production	13 Climate Action	14 Life Below Water	15 Life on Land	16 Peace, Justice and Strong Institutions	17 Partnerships for the Goals
Sourcing of Materials									X		X	X	X				
Material Use						X					X	X	X	X	X		
Waste						X					X	X	X	X	X		
Water Usage			X			X						X	X				
GHG Emissions			X						X		X	X	X		X		
Procurement Practices	X				X				X	X	X	X	X	X	X		
International Labor Laws	X	X	X		X			X	X	X							X
Child Labor			X	X				X									X
Occupational Health & Safety			X					X									
Local Communities	X	X	X	X	X	X	X	X	X		X	X		X	X		
Economic Impacts	X		X					X	X	X							
Economic Inclusion	X		X		X			X		X							
Modern Slavery			X					X		X							X
Corruption										X		X					X
Anti-Competitive Behavior							X			X		X					X
International Trade Laws								X	X			X					X

“SDG Goals”

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ACADEMIC VITA

JONATHAN EYER

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EDUCATION

Pennsylvania State University **University Park, PA**
Schreyer Honors College | Smeal College of Business
Bachelor of Science in Supply Chain & Information Systems *August 2018–Spring 2022*

RELEVANT EXPERIENCE

General Motors **Grand Blanc, MI**
Logistics Intern, Customer Care & Aftersales *May 2021 – August 2021*

- Developed recurring Excel reports to document On Time Delivery metrics for inbound aftermarket part shipments totaling over 150,000 items per day to uncover bottlenecks in the logistics network.
- Revised the Statement of Responsibilities for the 3rd Party Logistics Provider working with managers across the Supply Chain Warehousing & Logistics department to summarize all proposed changes for presentation to executives.
- Organized on a team of 10 other interns, a company-wide virtual intern event for the 500+ General Motors summer interns with the purpose of providing a casual networking and internship recap opportunity.

Volvo Group Aftermarket Export Visualizations **University Park, PA**
Supply Chain 404 Honors *September 2020 – December 2020*

- Created visualizations for the exports supply chain of Volvo Group's aftermarket parts using tools including PowerBI, and Tableau that are automated for continued use by Volvo Group after the finish of the project.
- Mapped the main flows of Volvo Group's service market logistics between export dealers and customers to visualize volumes of exports, freight cost and overall freight delivery performance.
- Conducted interviews with key stakeholders within the Volvo Group to understand how their aftermarket export supply chain works across multiple countries and continents, organizing meetings with international employees.

LEADERSHIP EXPERIENCE

Phi Gamma Nu Professional Business Fraternity **University Park, PA**
Vice President | Recruitment Chair | Pledge Class THON Chair *January 2019 – December 2020*

- Organized fundraising for THON, contributing to our total of \$133,316.53 raised to support children battling pediatric cancer, the largest amount of any of Penn State's general organizations.
- Managed engagement professionally and philanthropically through a points system and maintained attendance of the 166-chapter members to ensure the sustained success of the fraternity in each of its 3 pillars, professional development, philanthropy and brotherhood.
- Developed a recruitment strategy to select 33 new members for the organization for the spring 2020 semester by organizing 5 events and administering interviews to find new members from a pool of over 200 applicants.

Soles4Souls Penn State **University Park, PA**
Internal Relations Chair *April 2019 – April 2021*

- Tasked with retaining members of the organization through running relevant and interactive biweekly meetings and ensuring maximum involvement from organization members.
- Implemented a new standard of involvement from members through utilizing breakout groups during meetings and setting up monthly activities including shoe drives and packaging nights to support the mission of Soles4Souls while building relationships internally.

ADDITIONAL EXPERIENCE

Deloitte Leadership Development Conference **University Park, PA**
Selected Participant *October 2020*

- Selected to participate in a full day developmental leadership assessment center similar to those utilized for developmental, selection, or promotional decisions for executives in public, private, and government organizations.
- Engaged in written, presentation, role play, and leaderless group discussion exercises housed in a business simulation to solve organizational challenges.
- Received individualized developmental feedback based on the assessment and created an action plan to grow in specific leadership competencies.

ADDITIONAL INFORMATION

Interests: Spanish Language, Sustainability, Photography, Traveling, Wildlife, Golf, National Parks, Baseball, Culinary Arts, Movies