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Corporate Social Responsibility: Examining the Effects of a Lean and Green Supply Chain on Bottom Line Costs and Market Valuation

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ABSTRACT

This paper examines the link between a firm's adoption of Corporate Social Responsibility (CSR) practices and the resulting monetary benefits. Specifically, it addresses four major areas of business operations that present great opportunities for supply chain cost reduction and a simultaneous decrease in environmental impact. These four areas include traditional/open-loop supply chains, product packaging waste, pollution at the manufacturing site, and logistics inefficiencies. The paper then identifies several business cases in which companies have addressed several environmental issues and driven down bottom-line costs in each of the four areas through innovation and increased resource productivity. Along with cost benefits, it has been proven that companies that demonstrate improved environmental management practices see an increase in their market valuations. This paper also explores philosophical and contradicting views on CSR, defines sustainable development and the Triple-Bottom-Line (3BL) approach, and explains the importance of supply chain visibility for an effective CSR implementation.

1. COMPREHENSIVE OVERVIEW OF CSR

1.1 Introduction: CSR and Sustainable Development

Corporate Social Responsibility (CSR) has been given several different definitions throughout the years; however, a comprehensive definition commonly referenced in CSR literature comes from the United Nations Industrial Development Organization (UNIDO):

> "Corporate social responsibility is a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders. CSR is generally understood as being the way through which a company achieves a balance of economic, environmental and social imperatives (Triple-Bottom-Line Approach), while as the same time addressing the expectations of shareholders and stakeholders" (Venkatesh & Bose, 2015).

We are living in a time in which CSR has become a higher priority to businesses than ever before. In recent years, most Fortune 500 companies have publicly announced their individual commitments to social responsibility, whether these commitments take the form of the creation of a charitable foundation, a sizeable donation to the community or environment, a partnership with a non-profit, or a recycling program. Though there are several factors contributing to CSR's recent spike in popularity amongst businesses, a major factor leads back to the financial crisis of 2007-2008. The crisis' impact on the global economy reinforced the notion that the stability of the global markets greatly depends on responsible business behaviors and robust models of sustainable business activities.

CSR is often identified alongside the concept of *sustainable development*, which is defined to be "the course of economic development which does not significantly and irreversibly

violate man's living environment, reconciling the laws of nature and the laws of the economy" (Kozlowski, 1994). In other words, to sustainably develop a business is to find solutions to business activities that are socially responsible and environmentally-friendly, while simultaneously being economically valuable. At the core of corporate sustainable development is the belief that in order for a company to survive in the long-term, the company must satisfy social needs by providing products and services in such a manner that does not deteriorate natural or social capital (Zak, 2015).

Within the scope of sustainable development is the Triple-Bottom-Line (3BL) approach, which is mentioned in the UNIDO definition of CSR. The 3BL approach is the framework by which companies are able to measure their CSR efforts. The key insight from the 3BL is that businesses should continuously strive to find a balance between three important dimensions: economics, ecology, and ethics (Zak, 2015).

The 3BL notion was introduced by John Elkington in 1994 in an article in *California Management Review* and thoroughly expanded upon in his book, *Cannibals with Forks: the Triple Bottom Line of 21st Century Business* (Elkington, 1999). Elkington argues that companies should measure three quite distinct bottom lines. The first bottom line is the traditional measure of corporate profit -- the "bottom line" of the profit and loss account. The second is the bottom line of the company's "people account", which measures how socially responsible a company has been throughout its operations. The third is the bottom line of the company's "planet account", which measures the extent to which the company has been environmentally responsible (Zak, 2015). The 3BL is also referred to as the "3 P's" in business literature -- people, profit, and planet.

The 3BL is impactful because it can help a company not only to look at the economic value it generates through its operations, but also to incorporate environmental and social values into the analysis of the company's activities. The benefit that the 3BL offers is based off the assumption that in the midst of a company's commitment to the generation of value, the company is simultaneously involved in practices that destroy value in other places. Thus, the 3BL notion captures the entire set of values, problems, and processes that a company must take into consideration in order for the company to 1) mitigate against any harmful repercussions that stem from its normal business activities, and 2) generate value in each of the 3BL areas (economic, social, and environmental).

The 3BL, and CSR in general, can be a difficult concept for many companies to grasp because it signifies that a company's responsibilities are far greater than simply those related to the economic aspects of providing goods and services to customers under regulatory standards at a profit. The 3BL adds social and environmental performance measures to the traditional economic measures used by most companies. Environmental performance generally pertains to the amount of resources a company uses in its operations (e.g., water, land, energy) and the by-products its operations generate (e.g., waste, chemical residues, air emissions). Social performance generally pertains to the impact that a firm and its supply chain members have on the communities in which they operate (Zak, 2015).

Evaluating performance against these measures can be a difficult task. While measures such as shareholder value, customer satisfaction, and market share can be easy to quantify and are easily applicable from one company to the next, social and environmental performance measures are in most cases unique to each company and are often challenging to quantify (Zak, 2015).

That being said, there are several direct and easily-quantifiable monetary benefits resulting from CSR practices. In *The Sustainability Advantage: Seven Business Case Benefits of a Triple Bottom Line* (Willard, 2012), author Bob Willard presents the seven most easily-understood bottom-line benefits that result from sustainable activities and drive profit:

(1) increased revenue,
(2) reduction in energy expenses,
(3) reduction in waste expenses,
(4) reduction in materials and water expenses,
(5) increased employee productivity,
(6) reduction in hiring and attrition expenses,
(7) reduction in strategic and operational risks.

A few of these benefits will be discussed in great detail later in the paper through several business cases and a thorough analysis of a CSR financial model developed by Robert D. Klassen and Curtis P. McLaughlin. Before we narrow our scope, however, let us first look at a broad overview of a few philosophical viewpoints surrounding CSR.

1.2 Levinas' Four Managerial Motivations Behind Adopting CSR

One manager who chooses to adopt CSR practices within his business operations may be compelled to make this decision for an entirely different set of reasons than the next manager. A great deal of research has been conducted on managerial CSR motivations, but one of the most popular theories comes from Emmanuel Levinas, a French philosopher whose work focused on

existentialism, ethics, and phenomenology. In Levinas' book, *Otherwise Than Being or Beyond Essence*, he describes four distinct motivations that drive managers to act responsibly.

The first two motivations revolve around indifference to sustainability issues or an ongoing desire to publicly appear to care. In other words, these motivations are driven by the desire to maintain the current state of doing business or to seek a short-term financial gain, or by the narcissistic concern to protect the company and the individuals at the top.

The second two motivations center around the goal to reduce undesired environmental and social impacts, and beyond this, to create positive effects for the environment and society. The first of these motivations seeks to intertwine environmental and social concerns within the operating performance management systems of a company, and the second of these motivations goes beyond the walls of the company and creates a conversation with those who are subjected and vulnerable to the unintentional consequences of corporate decisions (Schaltegger & Burritt, 2018).

1.2.1 Reactionary Self-Management

The first motive Levinas describes is self-serving in nature. With this description, Levinas distinguishes between two polar extremes innate to all human beings: the 'ego' and the 'psyche.' Where the ego is one's feeling of self-importance, the psyche represents the "soul or spirit and encompasses ethical intersubjective relations" (Schaltegger & Burritt, 2018). In this first level of motivation, individuals are acting from their ego and only concerned with their own-self interest. Defending their economic self-interest can explain why some managers may approach social issues and practice corporate social responsibility. That is to say, if a manager is

acting from his ego, he will only engage in CSR activities for the purpose of protecting his existing business and production methods.

1.2.2 Reputational Narcissistic Management of Sustainability

The second motive discussed by Levinas is that of narcissism -- more specifically, the "narcissistic defense of reputation" (Schaltegger & Burritt, 2018). At this level of motivation, a manager may choose to engage in CSR activities only as a way to "defend or increase corporate or individual reputation through voluntary social and environmental activities which may evoke praise from stakeholders" (Schaltegger & Burritt, 2018). Narcissistic self-seeking is expressed through seeking applause for engaging in behaviors that are positively perceived by stakeholders.

1.2.3 Responsible Sustainability Management

The third motive goes beyond both the defense of existing business practices and the superficial reasoning behind engaging in CSR activities, and towards genuine improvements in environmental and social performance. Managers driven by this motive "may be ethically motivated to improve performance in relation to sustainability by striving for organizational excellence" (Schaltegger & Burritt, 2018). CSR, then, serves as a means to an end of management excellence and an improved corporate performance overall. Focusing on seeking out combined benefits from costs savings generated by improved environmental and social performance "provides a change in emphasis from the reactionary view that social and environmental improvements must lead to an increase in costs" (Schaltegger & Burritt, 2018).

Later in the paper, we will explore several business cases driven by this type of managerial motivation, such as the closed-loop supply chain developed by the Dutch flower

industry and Wal-Mart's packaging optimization initiative -- two examples that illustrate an improved environmental impact and a significant reduction in costs.

1.2.4 Collaborative Dialogue, Empathy-Based Management

The fourth motive is one that places the interest of others ahead of the interest of oneself. With this, it has an "overriding focus on the 'other' through social relations, dialogue, participation and collaboration" (Schaltegger & Burritt, 2018). According to Levinas, a fundamental foundation for ethical capacities is the ability for a person to go beyond themselves and have genuine feelings for others, including the vulnerable. Applying this to corporations, effective and sustainable supply chain management goes beyond the "traditional entity" and requires different responsibilities than those of traditional business operations. The most important of all these responsibilities is cooperation with stakeholders, including vulnerable groups like the poor (Schaltegger & Burritt, 2018).

This is an important managerial motivation to understand, because although it may seem too altruistic for shareholders to readily accept, there are many business cases in which a company successfully adopted this extremely philanthropic mindset to create *shared value* between the company and its stakeholders. For example, Nestlé had been facing an ongoing challenge of obtaining a reliable and steady supply of specialized coffees. This obstacle came from the fact that most coffees are grown by small farmers in rural, impoverished areas in Latin America and Africa; in these areas, farmers' production volumes are limited by low productivity, poor quality and environmental deterioration. Nestlé decided to address these issues by redesigning its procurement process. The company worked closely and intensively with its farmers, providing advice on farming practices, ensuring that they received bank loans, and

providing any materials they needed such as plant stock, pesticides, and fertilizers. Nestlé also built local facilities so that it could measure the coffee quality at the point of purchase, allowing it to pay a premium for better coffee beans which went directly to the growers, thus improving their incentives. Through this initiative, greater yield per hectare and improved production quality were made possible, which not only increased farmers' incomes but also reduced the environmental impact of farms. Nestlé's stable supply of high-quality coffee grew remarkably. Shared value was created through Nestlé's collaboration with its stakeholders (Porter & Kramer, 2011).

Another great example of this collaborative shared value comes from Yara, the world's largest mineral fertilizer company. Yara noticed that many farmers in Africa were prevented from gaining easy access to fertilizers and other important agricultural inputs, and from efficiently transporting their crops to the market, as a result of inadequate infrastructure. Yara took on this problem with a $60 million investment in a program that improved roads and ports, and through dialogue with local governments, with the end goal of creating "agricultural growth corridors" in Tanzania and Mozambique (Porter & Kramer, 2011). The corridor is expected to benefit over 200,000 small farmers and create 350,000 new jobs in Mozambique alone. These improvements will also help Yara significantly grow its business.

When approaching CSR with this collaborative mindset -- as in the cases of Nestlé and Yara -- both parties benefit from new value creation, and the benefits are long-lasting.

1.3 Contradicting Viewpoints on CSR

There is a wide range of opinions surrounding CSR with brilliant minds on both ends of the debate and an abundance of well-constructed, deeply thought-out arguments from

researchers, industry professionals, and philosophers alike. The following section serves to present an overview of the most commonly-heard arguments from advocates and critics of the CSR initiative.

As is the case for any argumentative piece, it is very important to present both sides of the argument at hand. In this case, although the mission of the paper is to present a business case in favor of CSR, it is ultimately at the discretion of the reader to form his or her own opinion while keeping in mind that the answer is not always black or white. Positive change arises from challenging the viewpoints of others, from conducting primary and secondary research, from learning, reflecting, and collaborating. Such is the beauty of academia.

1.3.1 CSR Advocates

Some argue that CSR should be a necessary undertaking of corporations because the majority of corporations have far more influence (specifically, money and power) than any individual on his or her own to address the multitude of global issues in today's world. And thankfully, to CSR advocates, there exist dozens of companies around the world whose sole purpose is to attack global issues. There are publicly traded organizations like Waste Management Inc. that are dedicated to waste cleanup and recycling practices. There are non-profit organizations such as Medecins Sans Frontieres (more commonly known as Doctors Without Borders in the United States) that deliver medical services to people in the midst of crises (e.g., epidemics, natural disasters, government conflicts) or to those excluded from health care. There are also many other smaller organizations that focus on issues such as social injustice (e.g., Lambda Legal, PEN America, and Council on American-Islamic Relations), hunger (e.g.,

Feeding America), and child labor (e.g., International Program on the Elimination of Child Labor, or IPEC, a department of the International Labour Organisation).

Many Fortune 500 companies participate in a diverse range of CSR practices, either in addition to or integrated into their normal business operations. General Electric's GE Foundation contributed $88 million to community and educational programs in 2016. 3M's program, 3MGives, raised $67 million in 2016 to donate to communities, environmental causes, and educational initiatives that help increase student interest in technology and science. Zappos' charitable group, Zappos for Good, partners with charitable organizations to donate items such as shoes, books, and school supplies to underserved communities. Virgin Atlantic's "Change is in the Air" sustainability initiative is comprised of three pillars: environment, sustainable design and buying, and community investment. Since 2007, Virgin Atlantic has reduced its aircraft carbon emissions by over 20% and has partnered with LanzaTech to develop eco-friendly fuels for the future.

To push even more companies towards the adoption of CSR practices, the United States government has made a case several times for the impact corporations can make on our nation and beyond. During his presidency, Former President Bush asked companies to begin donating to a global AIDS fund (Perlez, 2001), while Former President Clinton pushed for minimum labor standards to be included in all international trade agreements (Mitchell, 1996). As part of the Economic Recovery Act of 1981, Congress approved an increase (from 5 percent to 10 percent) of the permissible corporate tax deduction for charitable contributions (Mills & Gardner, 1984). Beyond the government, major charitable foundations (such as the Ford Foundation, the Sloan Foundation, and the Aspen Institute) have endlessly worked to urge business investment in the remediation of societal issues.

Every day, more and more business leaders themselves are responding to these calls to action for increased CSR. Whether they are partaking in CSR by completely modifying their existing business practices to integrate sustainable activities into their operations, or taking a more indirect approach by simply donating money to a cause, these business leaders are advocating for and affirming the belief that companies can play a prominent role in the improvement of human welfare. That is, they are setting an example for other businesses by demonstrating that businesses can, and should, be concerned with more than simply maximizing profits for their shareholders. This is the tension point at which many CSR critics jump in.

1.3.2 CSR Critics

Critics of CSR pose many well-thought-out arguments, a prominent one being that social issues are completely unrelated to the mission of corporations, that mission being the creation of value for its shareholders and nothing else. Many critics also contend that CSR can be a costly undertaking and a misuse of shareholder capital; it is often difficult to quantify and account for; and, as Levinas' theory points out, the driving force behind CSR undertakings can sometimes be narcissistic and self-serving motives (Levinas, 1991).

One of the earliest and most noteworthy decisions in opposition to corporate social responsibility came from the famous *Dodge v. Ford* 1919 Michigan Supreme Court decision. By the year 1916, Ford Motor Co. had acquired a capital surplus of $60 million. Ford's most popular product, the Model T, had seen a steady price decrease over the years while the income of Ford's workers had been dramatically increasing. Recognizing a special opportunity, Henry Ford, the company's president, announced his desire to cease payment of special dividends to shareholders and use this money instead as an investment in the construction of new manufacturing facilities.

This investment would allow Ford to greatly increase car production and the number of employees at his plants, while maintaining the steady decrease of costs and prices of his automobiles. In a public statement, Ford explained:

> "My ambition is to employ still more men, to spread the benefits of this industrial system to the greatest possible number, to help them build up their lives and their homes. To do this we are putting the greatest share of our profits back in the business" (*Dodge Brothers v. Ford Motor Company*, 1919).

Ford's shareholders greatly objected to this proposal, displeased with the fact that their special dividends were about to terminate and more generally, that their value to Ford was not a primary consideration behind his vision. When this case reached the Michigan Supreme Court, it was held that Ford was to adjust his focus and continue the operation of Ford Motor Co. at the stake of his shareholders rather than in a charitable way at the benefit of employees and customer base (*Dodge Brothers v. Ford Motor Company*, 1919). This famous court decision affirms a concept often referred to in literature as *shareholder primacy,* a theory encircling corporate America stating that shareholder interests should be prioritized above all other stakeholders (Smith, 1998).

The famous Milton Friedman, American economist and 1976 Nobel Prize recipient, also took a firm stance against corporate social responsibility in a piece he wrote for *The New York Times Magazine* in 1970. When talking about CSR, he explains, businesses cannot be said to have "responsibilities"; only people can have responsibilities. Therefore, it is the businessmen who make up these corporations -- the corporate executives -- on which these presumed responsibilities fall. "In a free-enterprise, private-property system," Friedman writes, "a corporate executive is an employee of the owners of the business. He has direct responsibility to

his employers." And this responsibility, *as the agent of the individuals who own the corporation*, is to run the business according to their wishes, which in most cases is to maximize profits while ensuring business practices are maintained within the boundaries of the law and ethical customs.

This is not to say that a corporate executive doesn't have his own responsibilities that he assumes individually -- responsibilities to his family, for example, or his community, his place of worship, to a specific non-profit organization, etc. Accordingly, he may choose to allocate a portion of his income, time, or energy to these causes. But if he does so, he is acting as a principal, not an agent. If he acts individually, the money, time, or energy he is devoting to these causes is entirely his own -- not the funds of his employers, nor the time or energy to which he has contractually committed himself to serve their interests. "If these are 'social responsibilities,'" says Friedman, "they are the social responsibilities of individuals, not of business" (Friedman, 1970).

Friedman also makes a similar point to Levinas' argument in his piece, as another critique to CSR: that many times, CSR is used as a veil by corporations to disguise the true intentions behind their so-called "socially-responsible" efforts. For example, it could likely be in the long-term interest of a major corporation in a small town to make a sizeable investment into the amenities and resources for that community, or into enhancing its government. "That may make it easier to attract desirable employees," Friedman mentions, "it may reduce the wage bill or lessen losses from pilferage and sabotage or have other worthwhile effects" (Friedman, 1970). Like the different managerial motives behind adopting CSR that Levinas explores, Friedman agrees that oftentimes managers' socially-responsible intentions are not so pure. That being said, whether well-intentioned or not, surrounding communities and stakeholders undoubtedly benefit from CSR initiatives to some extent. Therefore, if companies were held to a higher set of

expectations, labor and environmental practices would ultimately improve -- despite the intentions. Nonetheless, virtuous intentions behind sustainable behaviors arguably have more profound and long-lasting effects, as managers with principled mentalities are more likely than their counterparts to demonstrate *ongoing* commitments to sustainability.

1.3.3 Summary of Critiques and the Goal of Advocates

There are many others who oppose CSR, each criticizing the initiative from a slightly different angle. In summary, their main ideas can be boiled down to two main concerns: misappropriation and misallocation (Margolis & Walsh, 2003).

When companies begin adopting socially responsible practices, a major point of concern is that business managers will misappropriate corporate funds by redirecting the funds away from their rightful owners (usually defined as company shareholders, though sometimes employees are included in the definition as well). These funds can also be misallocated by managers in the sense that they may take resources that would be best used to serve one purpose and instead allocate them to an area in which the resources are less likely to thrive. In other words, these managers' social initiatives, though well-intended, would be comparable to "using a dishwasher to wash clothes" (Margolis & Walsh, 2003).

Those opposed to CSR are not cold-hearted; as much as anyone else, they would love to put an end to human suffering and live in a prospering world. However, they do not see it as a corporation's responsibility to redirect its funds to directly take on society's issues. They believe that the best thing a corporation can to to contribute to society is to continue "doing what it does best": provide goods and services to society, thus giving people jobs, fulfilling human needs, and generating wealth (Margolis & Walsh, 2003).

The daunting task, then, for CSR advocates who want to put an end to human suffering while also staying within the boundaries of shareholder wealth maximization is to demonstrate a positive correlation between corporate attention to societal ills and the creation of wealth for a corporation's shareholders. In the words of the Former United Nations' Secretary General Kofi Annan (2001), the goal is to find "a happy convergence between what your shareholders want and what is best for millions of people the world over." The 3BL approach -- finding a balance between the environment, people, and capital -- sounds appealing in theory. We will now explore what it looks like when put into practice.

2. IMPACT OF CSR ON FINANCIAL PERFORMANCE

2.1 The CSR-CFP Relationship

Keeping in mind shareholders' interest in profit maximization while also looking beyond it has been an intriguing topic for many empirical researchers and organization theorists to study over the past four decades. The majority of research on this topic has continued to revolve mainly around one core point of interest: the establishment of a positive correlation between corporate social performance (CSP) and corporate financial performance (CFP) (Margolis & Walsh, 2003).

This has been such an important correlation to prove because it could completely shift the way CSR is often perceived: as a costly investment. A positive correlation between CSP and CFP signifies that an investment today in sustainable business practices creates more wealth for shareholders in the long-term. Viewing CSR in this new way -- as a monetary benefit as well as a societal benefit -- could prompt far more business leaders to take a good look at their 3BLs, incorporate more sustainable practices to generate more value for their firms, and in turn, significantly impact the world.

2.1.1 Environmental Management vs. Firm Performance

Although there exist many branches of CSR, for simplicity and ease of measurability purposes, environmental management alone will be considered for the time being. The CFP of a firm is affected by strong environmental practices through both cost and revenue (market) pathways (Klassen & McLaughlin, 1996). Klassen and McLaughlin summarize these two pathways in their model, "Linkage of Environmental Management to Firm Profitability" -- the model illustrates both pathways ultimately leading to an improvement in a firm's CFP (Figure 1).

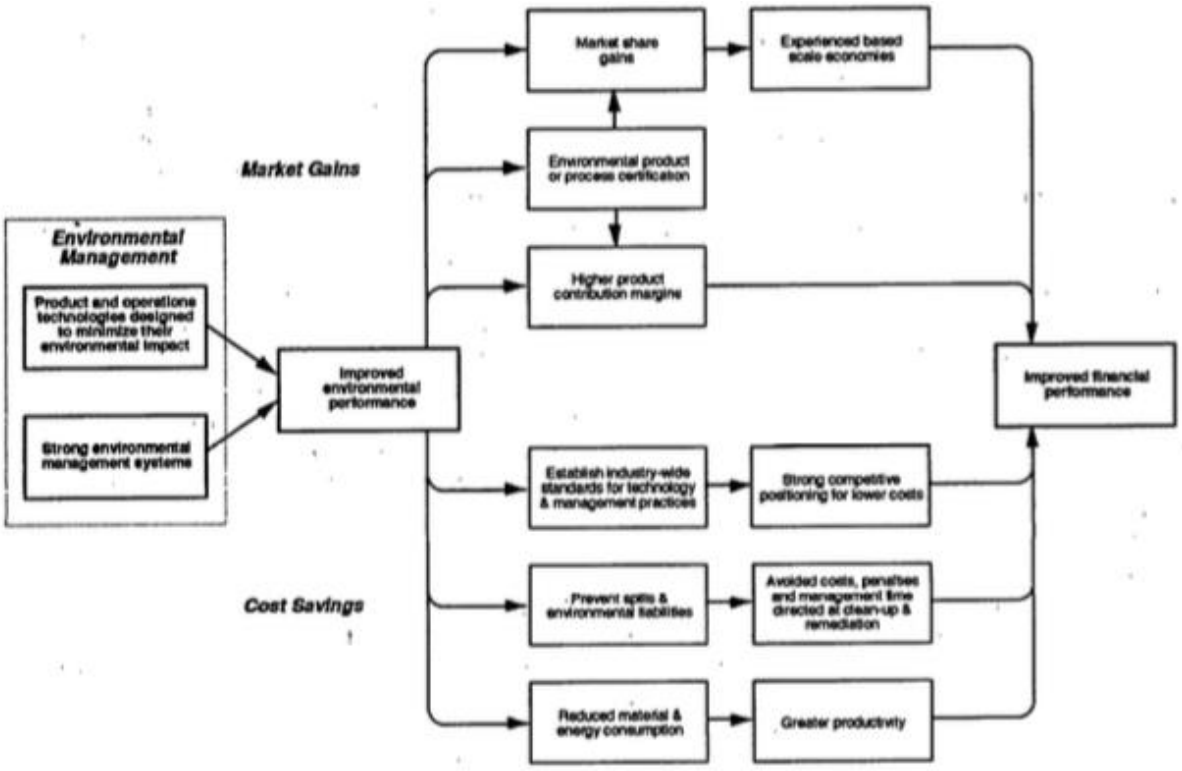

Figure 1. Linkage of Environmental Management to Firm Profitability. Reprinted from "The Impact of Environmental Management on Firm Performance" by R.D. Klassen and C.P. McLaughlin, 1996, *Management Science, 42*(8), 1202. Copyright 1996 by the Institute for Operations Research and the Management Sciences.

On the cost side of environmental management, firms that make the decision to invest in environmental management systems hedge against the potential for environmental spills, liabilities, and major crises -- all costly events. The costs of materials waste and inefficient processes are also reduced with these investments. Firms that move ahead of environmental regulations to ensure that their products and/or operations do not significantly impact the environment are in a better position compared to their competitors to meet stricter environmental standards down the road. This means that should strict environmental standards be imposed on an industry at any point, firms already enforcing environmentally-friendly standards are much less likely to worry about setting everything aside to redesign their operations in the imposed timeframe (which would be a costly undertaking), nor would they be at as much risk of getting

fined. Beyond this, because environmental requirements often call for top-of-the-line technology, an industry leader could gain a significant competitive advantage by creating an industry-wide standard against which all competitors would be assessed, in turn potentially creating a barrier to entry (Klassen & McLaughlin, 1996).

On the market gains side of environmental management, there has been a growing trend over the past few decades of consumer interest in environmentally-oriented (and, more generally, socially responsible) companies (e.g., Rosewicz 1990). Therefore, companies who demonstrate manufacturing efforts that minimize negative environmental impacts of their products and operations, recycle post-consumer waste, and establish environmental management standards are in a better position to expand their markets and displace any competition that fails to instill and convey to consumers the same environmental practices (Klassen & McLaughlin, 1996). Environmental certifications like EPA, EcoLogo, and ISO 14001 provide a new basis for differentiation for the consumer, whether the consumer is in a B2C or a B2B transaction. Further, environmental conscientiousness may become a necessary undertaking in order for some markets to survive in the long run. A great example of this was when the laminated, disposable drink box industry (e.g., Tetra Pak) was threatened with product-use restrictions in Maine unless they changed their processes to incorporate effective post-consumer recycling systems (Associated Press, 1989). With all of this in mind, there is much greater opportunity for increased cash flows as a result of improved CSR -- this cash flow increase is captured in a company's market valuation[1]. Thus, as Klassen and McLaughlin argue in their model, an increased market valuation combined with reduced supply chain costs leads to improved financial performance of a CSR-driven firm (Klassen & McLaughlin, 1996).

[1] This was shown in a 1996 study conducted by Klassen and McLaughlin that will be discussed later in the paper.

Both cost to the company and market valuation as a direct result of CSR initiatives will be discussed in greater detail in the following sections. Corporate environmental efforts (the "planet" account of the 3BL) will constitute the CSR emphasis throughout the majority of the paper. Strictly from a cost and supply chain perspective, corporate environmental efforts (i.e., reducing negative effects to the environment through increased resource productivity) have shown to produce the most significant positive effects compared to the other side of CSR (the "people" account of the 3BL) such as ethical labor practices, fair trade and non-profit partnerships.

This is not to say that "people" CSR initiatives do not improve a company's financial position. In fact, there is a body of academic research demonstrating that these initiatives are gaining more traction with consumers than ever before, which in turn significantly increases revenues for companies that partake in these efforts. However, these initiatives mainly drive revenue as a result of personal consumer preferences and effective marketing. Thus, although the social side of CSR is powerful and important -- both to the world and to participating companies -- this paper will primarily focus on the resulting *costs* from supply chain and environmental performance improvements as opposed to *revenues* stemming from consumer responses to social initiatives.

3. CSR IN THE SUPPLY CHAIN: COST FOCUS

3.1 Managerial Considerations

When initially thinking about decreasing the environmental impact of their existing business operations, an inevitable consideration for business managers is the cost associated with this process modification. After all most business process improvements require an investment -- whether in the form of new technology, R&D, employee training, materials substitution, etc. It is natural to assume that directly tied to increased costs comes higher prices and a reduced competitive edge in the market. However, this way of thinking creates a gridlock in the realm of environmental protection and improvement; while one side of the table vehemently urges companies to be held to higher standards, the other side -- the corporate side -- pushes back. The winner of this battle, then, primarily depends on the status of corporate environmental regulations which alter, increase, and decrease every few years (mainly as a result of powerful lobbyists in Washington, D.C.). This wavering from one side of the table to the other is counterproductive and costly; thus, we must find a more firm and sustainable solution.

There are many factors at play here for managers. On the one hand, nobody wants to live on a dirty planet. On the other hand, managers must satisfy their shareholders and continue striving to improve their margins. How can they explain to their shareholders that investing in environmental initiatives would be a good use of their capital?

It would be helpful if managers and their investors could be nudged to shift the way they think about environmental standards. Instead of approaching sustainable solutions with hesitation towards the costs they will *introduce,* they should instead focus on the costs that these solutions will *eliminate,* as these solutions will allow managers make better and more productive use of their resources.

3.2 The Cost Savings of Higher Resource Productivity

Resource productivity is at the heart of supply chain cost savings and the environmental impact of normal business operations. In their article "Green and Competitive: Ending the Stalemate" from the *Harvard Business Review*, authors Michael E. Porter and Claas van der Linde explain that when a company pollutes in any form -- whether releasing scraps, forms of energy, or harmful chemicals into the environment -- it indicates that the company is handling its resources "incompletely, inefficiently, or ineffectively" (Porter & van der Linde, 1995). This waste represents a cost to the company (in the form of wasted materials with the loss of potential for re-use) and to the environment (in the form of harmful materials interfering with the natural course of the ecosystem). Further, when this happens, the company then has to spend additional resources to clean up its mess. This presents an additional, albeit avoidable, cost that creates no value for customers.

When environmental standards come into play, however, they can create higher resource productivity within a firm, which ultimately makes companies more competitive in the market. Porter and van der Linde argue that with appropriately-designed environmental regulations, corporate innovations can be triggered that enable companies to more productively use their resources (i.e., energy, raw materials, labor, etc.)[2]. When resources are used more productively, waste is reduced, the cost of the final product is lowered and/or the value of the product is enhanced. As such, the cost of implementing environmentally-friendly business practices is

[2] Refer to the Klassen and McLaughlin study explaining that from a cost and competition standpoint, it is more beneficial for a company to be ahead of environmental regulations (proactive) than to be in a position where the company has to rush to meet the regulations once they are imposed (reactive) (Klassen & McLaughlin, 1996).

offset by this new value creation, and the gridlock between regulators and companies is broken (Porter & van der Linde, 1995).

In the supply chain, resource inefficiencies are most frequently and conspicuously in the form of incomplete capital, equipment, and labor utilization, as well as poor control over processes. These obvious inefficiencies traditionally come directly from the factory and its assembly line(s) and normally result in unnecessary wastes such as defects, waiting, and excess materials held in inventory. However, it is important to understand that beyond these more apparent wastes[3], a) many inefficient practices occur beyond the walls of the manufacturing facility and require more complex measures to resolve (as they are farther removed from the manager's line of sight), b) there are significant costs tied to these practices that are *hidden beneath the surface* as a result of resource unproductivity, and c) many of these not-so-apparent inefficiencies not only present a major cost to the company, but also take a toll on the environment.

Through careful research, I have identified four areas of the supply chain to explore that each have the potential to be extremely inefficient (and in turn, costly) to a company and harmful to the environment:

(1) traditional/open-loop supply chains,

(2) product packaging waste,

(3) pollution at the manufacturing site,

(4) logistics inefficiencies.

[3] Refer to the "8 Deadly Lean Wastes" derived from the Toyota Production System (TPS) and conveniently condensed to form the acronym, "DOWNTIME": Defects, Overproduction, Waiting, Not utilized talent, Transportation, Inventory Excess, Motion waste, Excess processing (Liker, 2004).

None of these inefficiencies, nor their resulting costs, are mutually exclusive -- in fact, many solutions to each of these wastes go hand-in-hand very nicely. For example, the Dutch flower industry's response to environmental problems in certain parts of the Netherlands is an exemplary case of improved resource productivity to explore, as it touches on decreasing pollution (waste 3) by implementing a closed-loop supply chain (waste 1). Because flowers were being intensely cultivated in small areas of the Netherlands, the surrounding soil and groundwater was becoming increasingly contaminated by fertilizers, pesticides, and herbicides used in the flower cultivation process. The industry soon found itself faced with strict regulations on their use of chemicals, to which they responded with the creation of a very effective closed-loop system. Now, instead of growing their flowers in soil, the Dutch found a way to grow them in advanced greenhouses with water and rock wool, an insulation material similar to fiberglass (Porter & van der Linde, 1995).

The Dutch reaped many benefits from their new approach. First of all, the risk of infestation was greatly reduced in this new system, so there was no longer a necessity for fertilizers and pesticides. Because this closed-loop system was closely monitored and controlled, variation in growing conditions declined; therefore, the quality of the flowers improved. Handling costs also went down due to the specially-designed platforms on which the flowers were cultivated. The end result of these environmental regulations was not only a significant decline in negative environmental impact by the industry, but also lower costs, higher product quality, and in turn, greater global competitiveness (Porter & van der Linde, 1995).

3.2.1 Closed-Loop Supply Chains

The Dutch flower industry process change is one example of a closed-loop supply chain. However, closed-loop supply chains can significantly vary in the way they look from one case to the next. In the past few decades, the supply chain was traditionally thought to be the linear flow of products from the manufacturer to the consumer -- in other words, an open-loop supply chain. It was not until recently that cyclic, sustainable processes were introduced to form a closed-loop supply chain -- this idea has gained a lot of attention recently, especially among those interested in making more efficient use of their resources.

A closed-loop supply chain (CLSC) is a "supply chain that is designed to consider the acquisition and return flows of products, reuse, manufacturing and recycling activities, and the distribution of the recovered items" (Difrancesco & Huchzermeier, 2016). CLSCs maximize value creation over the complete life cycle of a product through "dynamic recovery of value from different types and volume of returns over time" (Difrancesco & Huchzermeier, 2016).

There are three primary different *types* of returns at different *times* in the supply chain process that (re)manufacturers and retailers experience (Guide & Van Wassenhove, 2009):

(1) commercial returns (either 'defective' or 'non-defective'),

(2) end-of-use returns,

(3) end-of-life returns.

Defective commercial returns occur for obvious reasons: the product does not perform in the way that it had been promised to perform, and the customer is disappointed. Non-defective returns, however may occur for several reasons: the customer changes his or her mind, for

example, or the product does not satisfy the customer's expectations. When a new product is introduced to the market, commercial returns increase in this initial ramp-up phase, then reach a peak and remain fairly constant at this peak throughout the growth and maturity phase of the product life cycle. Then, in the decline phase, return volume declines in this ramp-down phase, as the product becomes discontinued and warranties expire -- this is when end-of-use returns occur, as the product's original use is completed but the product is still functional. These end-of-use returns are especially common for technological products[4]. Finally, end-of-life returns occur when the product no longer functions.

Smart companies understand that in the majority of cases, returned products have monetary value that can be recovered -- with recycling involved, there is less need for operational expenditures (OPEX) as the company makes more efficient use of its resources. Not to mention, returning products (to either the manufacturer for remanufacturing or to the primary producer for recycling) means that the product is not being disposed of in a dump (or worse, in a vulnerable ecosystem) -- recycling materials avoids the creation of waste. To this end, "environment and profit are not competing perspectives to be balanced, but can be maximized and optimized at the same time" (Difrancesco & Huchzermeier, 2016). Customer returns present a major opportunity for businesses to minimize their costs and simultaneously help the environment.

Dell is a highly-regarded industry leader for its recycling efforts and its closed-loop supply chain. As of June 2017, over 90 different products in the company's product portfolio consist of parts made from closed-loop plastics. Through Dell's Reconnect Partnership with

[4] For example, in the mobile phone industry, most wireless phone providers have an agreement with the customer where the customer can turn in their product after a certain period of time in exchange for an upgraded product. This is an example of an end-of-use return -- the phone being traded in has significantly less value than it did at the time of purchase due to its now mature (or, considered to be mature by the tech industry) hardware and software, though the device is still functional.

Goodwill, customers with Dell hardware can send their products back to Dell for the products to then be shredded, melted and ultimately molded into new parts to build new computers. A study by TruCost found that the company's closed-loop process yields a "natural capital net benefit of 44% (worth $1.3 million annually) compared to the use of virgin plastics" (Dell, 2018). An added benefit to their closed-loop supply chain, aside from lowering costs and saving the planet, is that this cost reduction allows Dell to lower their prices for the customer. This is a normal occurrence in closed-loop supply chains: it's a win-win for all stakeholders.

3.2.2 Product Packaging Optimization

Product packaging represents another significant under-the-surface supply chain cost. Porter and van der Linde claim: "Packaging discarded by distributors or customers [...] wastes resources and adds costs. Customers bear additional costs when they use products that pollute or waste energy. Resources are lost when products that contain usable materials are discarded and when customers pay -- directly or indirectly -- for product disposal" (Porter & van der Linde, 1995). There are several business cases we will explore in which seemingly negligible packaging design changes made a significant difference to bottom line costs and to the environment.

Wal-Mart took on the product packaging issue (simultaneously with a greenhouse gas emission issue) in an initiative it started in 2009. Recognizing that excess product packaging and greenhouse gases were not only damaging to the environment but also costly to the corporation, Wal-Mart tackled these two issues by reducing its packaging and optimizing its truck routes. This in turn saved the company $200 million, even as more products were shipped (Porter & Kramer, 2011). Scott McCall, Wal-Mart's Senior VP (Home & Seasonal) described the packaging optimization initiative as a "game of inches" at a Wal-Mart summit held in October of

2016: “If you think about our stores,” McCall said, “let’s just say a supercenter has 120,000 items in it. If we took one inch out of every item -- obviously some would be more, some would be less -- we’re talking about 120,000 inches. That’s 10,000 feet, almost two miles of packaging reduced in just one supercenter. Pretty impactful, huh?” (Popular Plastics & Packaging, 2017).

McCall shared two successful examples in his presentation of packaging design being optimized to reduce costs and reduce negative environmental impact. The first example was Sam’s Club’s change in flatware (kitchen utensils) packaging, where they removed the plastic film from the front of the package. This almost negligible design change resulted in an $83,000 savings and the elimination of 150,000 pounds of non-recyclable plastic. The other example McCall cited was the design change of nicotine gum packages. When one inch was taken off the packaging, the brand owner reduced the packaging by about 6%, which came out to be 20,000 pounds of material on an annual basis (Popular Plastics & Packaging, 2017).

Additionally, Wal-Mart recently made the switch from cardboard cases for egg cartons to reusable plastic containers (RPCs) for the eggs’ delivery to Wal-Mart stores. Not only did the RPCs use up to 50% recycled content, which produced a cost savings (and environmental savings) by itself, but this materials switch prevented 37 million eggs from being thrown away in the first year of this change (Popular Plastics & Packaging, 2017).

3.2.3 Pollution Reduction Through Strategic Innovation

Reducing pollution at the point of manufacturing through strategic innovation is another key component to improving resource productivity (and in turn, lowering costs) while also decreasing environmental impact. Because this can take many forms, I will provide a few examples of companies putting this theory into practice, beginning with Dow Chemical.

Dow Chemical's California plant produces a wide array of chemicals by scrubbing hydrochloric gas with caustic. Several years ago, they would store the wastewater from this process in evaporation ponds -- that is, until they were ordered by regulators to close the evaporation ponds within a year. Facing a lot of pressure to comply, Dow Chemical completely redesigned its production process to significantly reduce their use of caustic soda. This reduction decreased caustic waste by 6,000 tons per year and hydrochloric acid waste by 80 tons per year. On top of this major cost savings, the company realized that it could recycle a portion of the waste stream and use it as a raw material in other parts of the plant (implementing a lean, closed-loop process). Though this process modification only cost Dow $250,000 to implement, the company reaped an annual savings of $2.4 million (Porter & van der Linde, 1995).

Another prominent example of pollution reduction through innovation and increased resource productivity comes from Ciba-Geigy Corporation's reexamination of its waste-water streams at its dye plant in New Jersey after new environmental standards were imposed. Two major changes to the production process were made by its engineers. The first change was substituting an iron that created sludge for a less harmful chemical conversion agent. The second chance was eliminating the release of a toxic product into the wastewater stream. Not only did they realize an annual costs savings of $740,000, but they significantly reduced pollution and increased process yields by 40% (Porter & van der Linde, 1995).

One example of a small investment with immense benefits is that of DuPont, one of the world's largest chemical producers by chemical sales. It is very common in many chemical production processes to require an initial start-up period after an interruption occurs in production, in order to stabilize the process' output and ensure the output is within specifications. During this time, only scrap material is produced. After regulations raised the cost of waste

disposal, DuPont decided to install more advanced process monitoring equipment -- this, in turn, greatly reduced production interruptions (and the startups associated with these interruptions). Not only did the company lower its waste generation, but it became more productive by cutting the amount of time it wasn't producing anything. In a short period of time, the equipment more than paid for itself (Porter & van der Linde, 1995).

Innovation can have a significant impact on an entire company and its stakeholders. Pollution reduction at the source is one of the more manageable inefficiencies to tackle because in most cases the issue is centralized, giving business managers more visibility into the offenders. The next section will discuss logistics, which is more wide-ranging.

3.2.4 Logistics Optimization

There is a general consensus across climate change policy makers today that the world must limit its increase in global temperatures to no more than 3.6 degrees Fahrenheit above pre-industrial levels by 2100. If the increase is any greater than this, the world will most likely face irreversible consequences. In order to make this possible, global emissions of CO_2 must be reduced by 50% by the year 2020, with some developed countries, like the UK, committed to reducing emissions by 80% (McKinnon, 2010).

Logistics plays a very important role in the supply chain, yet also significantly contributes to air pollution across the globe. Across all of the different modes of transportation used in logistics (air, ocean, rail, and road), road transportation accounts for the majority of freight transport emissions. In the United States, 30% of greenhouse gases can be attributed to road transport (EPA Road, 2011), while more than 65% of greenhouse gases are the result of road transport in the European Union (EU Transport GHG, 2007). Within these figures, almost

6% of all greenhouse gases emitted by humans are the result of the flow of products to consumers (Blanco, 2013).

These numbers are in direct conflict with the 50% CO_2 emissions reduction goal, especially since freight ton-kms are predicted to grow at 2.3% per year between now and 2050. This projected rate is the result of a global increase in consumption (and in turn, production), supplemented by an increase in the average distance each unit of freight travels due to the expanding supply lines that globalization brings (World Business Council for Sustainable Development, 2004). Because of these increases, developing and implementing effective carbon-reducing strategies in the logistics sector has proven to be an ongoing challenge.

There are five main considerations on which carbon-reducing efforts can be focused (McKinnon, 2010):

(1) *Freight transport intensity*: the ratio of freight movement (usually expressed as ton-kms) to economic output.
(2) *Freight modal split*: the proportion of freight carried by different transport modes. Can be expressed as the ratio of ton-kms carried by more carbon intensive modes (e.g. road, air) to ton-kms carried by greener modes (e.g., rail, ocean, pipeline).
(3) *Vehicle utilization*: the ratio of vehicle-kms to ton-kms. In other words, the amount of vehicle traffic required to handle a given amount of freight movement. This ratio is minimized if the vehicles are well-loaded on outbound and return trips.

(4) *Energy efficiency*: the ratio of energy consumed to vehicle-kms traveled. This is mainly a function of vehicle characteristics, traffic conditions, and driving behavior.

(5) *Carbon intensity of the energy source*: the amount of CO_2 emitted per unit of energy consumed either directly by the vehicle or indirectly at the primary energy source for electrically-powered freight transportation operations.

Tied to each of these considerations are opportunities for improving the ratios. For example, in efforts to shift freight to less carbon-intensive transport modes (Parameter 2), several governments and multinational organizations, such as the EU, have taken steps to move away from air and road transport, the two modes of transport with the highest carbon intensities. They have begun investing in rail, inland waterway and port infrastructure, and providing subsidies and revenue-support for rail and water-borne services. An example of this investment was the Marco Polo II Program in the EU, which had the goal of "shifting the equivalent of the forecast increase in cross-border road ton-kms (20.5 bn) between 2007 and 2013 onto rail or water" (McKinnon, 2010).

Boise Inc. also recently launched two initiatives to move away from road transport and instead utilize more rail transport, in efforts to improve the company's environmental performance. Their two initiatives combined have resulted in a 62-72% overall reduction in Boise's CO_2 emissions, as well as significant cost savings for their shipments.

Their Carload Direct Initiative falls within Parameter 2, as this initiative focuses on shifting product transport to rail. While manufacturers traditionally either exclusively use trucks or use a combination of trucks and rail for transportation, Boise's goal was to exclusively use

trains (or come pretty close to it), as trains produce significantly less emissions than trucks and the company saw a huge opportunity to reduce its carbon footprint. So, Boise developed a strategy to send its products directly from the manufacturing facility to its customers' warehouses. This shift to exclusively utilizing rail reduced their CO_2 emissions by over 2,600 tons -- the equivalent of saving more than 264,000 gallons of fuel used by trucks (Blanco, 2013).

Complementary to this initiative, their Three-Tier Pallet Initiative falls under Parameter 3, as this one serves to increase railcar utilization. Prior to this initiative, Boise was loading its railcars two pallets high, with space between the top of the second pallet and the roof of the railcar; thus, the full capacity of the railcar was under-utilized. Noticing an opportunity for cost reduction and utilization improvement, Boise redesigned its pallets and loading methods by cutting its pallets in half, allowing them to restructure their pallet stacking and maximize shipping capacities. This redesign allowed Boise to significantly reduce the number of shipments required to deliver their product, and in turn, reduce CO_2 emissions. The company only used 930 railcars in 2011, which reduced the company's CO_2 emissions by 190 tons -- the equivalent of 21,637 gallons of fuel used by trucks (Blanco, 2013).

Over the past 40 years, the average fuel efficiency of new trucks has been increasing at a rate of about 0.8-1% per year, a statistic that satisfies Parameter 4. Additionally, according to recent studies, it has been shown that significant energy efficiency gains and CO_2 reductions are achievable in rail and air transportation, as well. For example, NYK, a Japanese shipping line, invented a 'super-eco' ship (projected for commercial use in 2030) which would have a 69% lower carbon footprint per container than any container ship in the ocean today. This was made possible by a complete hull redesign and the use of solar panels and fuel cells (McKinnon, 2010).

Looking at the results above provide enough evidence to support that taking the time to analyze a company's current carbon footprint (stemming from logistics practices), then developing a greener logistics strategy, pays off in the end -- for the company and for the planet.

3.2.5 Supply Chain Costs: In Summary

Although not often obvious costs, because instances of resource unproductivity can be well-concealed within the supply chain, these inefficiencies can add up. Unfortunately, environmental regulations tend to overlook these costs and focus more on improvements in pollution identification and/or waste disposal instead, which can be very costly undertakings.

While these approaches are undoubtedly virtuous, the focus should shift from where it is today -- the *actual costs* of eliminating and/or treating environmental damage -- to a deeper level of understanding the *opportunity cost* of environmental damage. This opportunity cost comes in the form of wasted resources, wasted endeavors, and reduced product value to the customer. "At the level of resource productivity," Porter and van der Linde emphasize, "environmental improvement and competitiveness come together" (Porter & van der Linde, 1995).

If a business can understand the opportunity cost wasting its resources, it can attack the problem proactively, before it occurs, instead of reactively once the damage has already been done. Not only is the proactive approach better for the environment but it is also much cheaper than the alternative, once regulators come into the picture.

3.3 You're Only as Strong as Your Weakest Link: Supply Chain Visibility

In assessing the corporate social responsibility efforts of a company, it is essential to look at the company's supply chain to ensure all members of the supply chain are exercising socially

responsible behaviors. If a member of the supply chain acts unethically, the company's reputation and sales could be irrevocably harmed. Such was the case with Mattel, a toy company, when one of its overseas vendors outside of the company's direct hierarchical control manufactured its toys using lead paint; this resulted in a recall of millions of toys and a steep decline of sales (Hoyt, Lee, & Tseng, 2008). In this case, one supply chain member's failure to uphold proper CSR practices ended up damaging the entire supply chain. Keeping this in mind, it is crucial to a company's CSR success to keep a close watch on its suppliers and their actions. But when operating a multinational firm, there are many factors that make this task especially difficult.

First of all, with globalization in full effect today, it is very common for multinational companies to use overseas suppliers in developing countries. Beyond the difficulty to supervise the activities of these suppliers due to sheer distance, the differences in cultures adds an additional layer of complexity. While one country may regard certain practices as "socially responsible," the other country may feel otherwise. An additional challenge to maintaining corporate social responsibility throughout a supply chain is that CSR clauses are different than contractual clauses, which are generally backed by legal principles. For the most part, CSR clauses are based on frameworks and accompanied by scorecards and guidelines for companies to follow and measure against. Because of this, a CSR clause is at much greater risk (as opposed to a contractual clause in the traditional sense) to be taken lightly and brushed aside, as there are no legal implications of doing so. A third difficulty companies face is coming up with an effective way to measure its CSR efforts. As opposed to most other business practices, CSR involves issues such as environmental contamination, discrimination, child labor, etc. These

issues tend to fall outside the boundaries of what businesses are easily able to track with traditional KPIs, such as return on investment (Wu et al, 2017).

Despite these challenges, there are several effective supplier development practices a company can establish to develop CSR throughout the supply chain. Some of these practices include the implementation of standard operating procedures (SOPs), audits, collaboration, and training. While SOPs and audits are *indirect* supplier development practices that are mainly exercised in response to institutional pressures, collaboration and training are *direct* supplier development practices that are put in place to close suppliers' CSR capability gaps. Moreover, collaboration and training enable companies to get feedback from their suppliers with accuracy and care, which then allows companies to customize their audits; this, in turn, makes their audits more efficient and effective. By providing guidelines, procedures, and information about suppliers' CSR capabilities, SOPs and audits significantly contribute to supply chain social responsibility. The value of SOPs is "realized by the collaboration and training practices because they determine the transformation from SOPs to supply chain social responsibility" (Zhang et al, 2017). Similarly, the value of audits can be realized if the company takes the information gained from the audits and apply this knowledge into direct supplier development practices (Zhang et al, 2017).

In conclusion, there are several ways in which a company can ensure its suppliers are on the same page as the company's own environmental, social, and ethical standards. It is not enough for a company to solely focus its efforts on reducing its costs and environmental impact at its own manufacturing plants close to home. If its suppliers are not following suit, the entire company is at risk of significant buried costs headed straight to the bottom line, reputational damage, and major environmental harm. A supply chain is only as strong as its weakest link --

because of this, it’s important to keep a close watch on each link and make sure that the whole chain is robust and sustainable.

4. MARKET VALUATION IN RESPONSE TO CSR

4.1 Market Response

4.1.1 Financial Background

On the financial side of CSR, lowering costs to the company (while also decreasing environmental impact) is definitely a win. But how do investors react to these CSR efforts? Robert Klassen and Curtis McLaughlin conducted a study in 1996 to answer this very question. Their study tested whether a company's environmental performance affected its financial performance. In most cases, equity return serves as the best indicator of a firm's financial performance. As such, according to the Capital Asset Pricing Model, the market's assessment of a firm's value can be shown by the firm's stock value (relative to other assets in the market carrying similar risk).

An important note is that based on the Efficient Market Theory, the publicly traded share price of a company consists of current and *expected* firm financial performance in its total valuation. When a company event becomes public knowledge, all future cash flows expected by this event are discounted by the market to the present (based on NPV). Information that is contained in firm-specific public events is "rapidly impounded" in that company's stock price; thus, any sudden change in the stock value implies that the market's assessment of future cash flows has changed (Klassen & McLaughlin, 1996).

4.1.2 Klassen and McLaughlin Study

With the financial theory holding true as the backbone of their study, Klassen and McLaughlin derived the following hypothesis to test:

> H1. Environmental performance, determined by environmental management initiatives, affects the financial performance and market valuation of a firm. More specifically, strong environmental performance positively affects the financial performance of the firm, and conversely, weak environmental performance has a negative effect.

To test the hypothesis, they utilized the NEXIS database of newswire services in search of two different types of company announcements:

(1) Positive events that confirmed strong environmental performance by a company and conveyed this message to the public
(2) Negative events that signaled weak environmental performance

The positive events were uncovered with the keyword search "environment" within five words of "award." The negative events (or environmental crises) were identified by keywords such as "oil," "gas leak," "chemical," or explosion" with the words "spill" and "environment." Because they needed financial data on the companies, they only considered publicly-traded firms on the NYSE or AMEX for their data. They used a three-day window to calculate the cumulative abnormal return (CAR) for each event type -- in other words, the event was announced on the first day of their designated window and the financial market's NPV of the event was captured in the day of the announcement and in the subsequent two days (Klassen & McLaughlin, 1996).

The results of their test were impressive. For the market's reaction to environmental awards (positive events), the average CAR was 0.63%, which was statistically significant. The average market valuation increased by about $80.5 million after the announcement of an environmental award. This strongly supported their hypothesis that the markets perceived a positive change in firm valuation (Klassen & McLaughlin, 1996).

The average CAR of negative events (e.g. spills or explosions) was significantly negative, at -0.82%. Throughout their entire sample, the average negative environmental crisis had a market valuation of -$390 million, which comes out to about -$0.70 per share. This can be explained by the market's reaction to the expected high costs attached to the clean-up of big spills and settlements of legal suits. Even if the damages are covered by insurance, "the loss of public trust and customer goodwill has ramifications for future profitability" (Klassen & McLaughlin, 1996).

The conclusion of their study: because of the Efficient Market Theory, stock prices serve as "proxies" for financial performance. Thus, in addition to the significant cost savings to be gained with better environmental management, to a large extent stock prices illustrate the actual financial benefits of a firm's improved environmental performance.

CONCLUSION

While it is true that implementing environmentally-friendly practices into a company's existing operations requires an initial investment, this investment pays for itself three times over. First, with increased resource productivity, costs can be significantly reduced and processes can become more lean and efficient. Customers can reap the benefits of this increased resource productivity by receiving higher value products -- either due to quality improvements or price reduction. Second, with improved environmental management, market valuation increases which improves corporate financial performance. Third, environmental damage is mitigated against, reduced, or even eliminated. Everyone benefits from CSR -- industries, business managers, shareholders, customers, communities, and ecosystems.

Despite the multitude of benefits the free market offers, one point of contention surrounding this economic system is that money equates to power. This principle can have its drawbacks (for example, the influence wealthy individuals and large corporations carry in Washington, D.C.) -- but it also carries the potential for a profound positive impact. Since many corporations have a significant amount of capital, they can use this power for the greater good. They can invest in R&D and technology to transform their operations into environmentally-friendly ones. They can work with engineers to redesign their products and packaging to reduce waste at each stage of the product life cycle. They can invest in their communities, their employees, and the planet through corporate foundations, nonprofits, partnerships, and educational programs, all while continuing to generate wealth for their shareholders.

Whatever CSR route they choose to take, companies' CSR efforts have the potential to create an impact far greater than any individual acting alone could create. With the amount of influence they hold, and with the vast network of stakeholders affected at each step of their

unique supply chains, companies are faced with the opportunity to transform the planet. It is then up to academics and industry leaders to keep the CSR conversation going.

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